INITIAL SUBMITTAL

HARRIS EXAM 2000-301

DECEMBER 11 - 15, 2000

INITIAL SUBMITTAL

INITIAL OUTLINE SUBMITTALS
NRC SUBMITTED/WRITTEN OUTLINES

CP&L

Carolina Power & Light Company
Harris Nuclear Plant
PO Box 165
New Hill NC 27562

SEP 2 6 2000

SERIAL: HNP-00-144

Mr. Michael E. Ernstes, Region II
United States Nuclear Regulatory Commission
Sam Nunn Atlanta Federal Center
61 Forsyth St., SW, Suite 23T85
Atlanta, GA 30303-8931

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
REACTOR OPERATOR AND SENIOR REACTOR OPERATOR
INITIAL EXAMINATIONS 50-400/2000-301 OUTLINES

Dear Mr. Ernstes:

Enclosed are the proposed examination outlines for the Reactor and Senior Reactor Operator Initial Examinations to be given at the Harris Nuclear Plant the week of December 11, 2000. This submittal complies with the requirement identified in the NRC's July 18, 2000 correspondence to furnish the outlines by September 27, 2000.

The enclosed materials shall be withheld from public disclosure until after the examinations are complete.

Questions regarding these materials may be referred to Mr. Terry Toler at (919) 362-3493 or to me at (919) 362-3313.

Sincerely,

Andy T. Barbee

Andy T. Barbee
Superintendent Operations Training
Harris Nuclear Plant

MGW

c: Mr. J. B. Brady (NRC Senior Resident Inspector, HNP) w/o Enclosure
Mr. Rich Laufer (NRR Project Manager, HNP) w/o Enclosure
Mr. L. A. Reyes (NRC Regional Administrator, Region II) w/o Enclosure

Facility: **SHNPP** Date of Exam: **11-Dec-00** Exam Level: **RO**

Tier	Group	K/A Category Points K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G*	Point Total
1 Emergency & Abnormal Plant Evolutions	1	2	2	3				3	3			3	16
	2	3	2	3				3	2			4	17
	3	1	0	1				0	1			0	3
	Tier Totals	6	4	7				6	6			7	36
2 Plant Systems	1	2	2	2	1	1	2	2	4	3	2	2	23
	2	3	2	1	3	1	2	1	2	2	1	2	20
	3	2	1	1	2	0	0	0	1	0	0	1	8
	Tier Totals	7	5	4	6	2	4	3	7	5	3	5	51

3 Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	
	4	3	2	4	13

Notes:

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).

2 Actual point totals must match those specified in the table.

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.

4 Systems/evolutions within each group are identified on the associated outline.

5 The shaded areas are not applicable to the category/tier.

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.

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 basis of plant-specific priorities. Enter the tier totals for each category in the table above.

8 Shaded K/As on the following pages indicate that the related questions appear ONLY on the RO examination.

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1			5				Power limits on rod misalignment	3.4	1
000015/17 RCP Malfunctions / 4					9		Determine/interpret when to secure RCPs on high temperatures	3.4	1
W/E09&E10 Natural Circ. / 4		2					Interrelations between heat removal systems	3.6	1
000024 Emergency Boration / 1		1					Interrelations between Emergency Boration and valves	2.7	1
000026 Loss of Component Cooling Water / 8						2.4.24	Loss of cooling water procedures	3.3	1
000027 Pressurizer Pressure Control System Malfunction / 3					15		Actions taken if PZR pressure instrument fails	3.7	1
000040 (W/E12) Steam Line Rupture - Excessive Heat Transfer / 4			2				Knowledge of normal/abnormal/emergency procedures	3.3	1
W/E08 RCS Overcooling - PTS / 4	2						Knowledge of normal/abnormal/emergency procedures	3.4	1
000051 Loss of Condenser Vacuum / 4						2.4.11	Knowledge of abnormal procedures	3.4	1
000055 Station Blackout / 6	2						Implication of natural circulation cooling	4.1	1
000057 Loss of Vital AC Elec. Inst. Bus / 6				5			Operate/monitor backup instrument indications	3.2	1
000062 Loss of Nuclear Service Water / 4				5			CCWS surge tank level control/alarms and radiation alarm	3.1	1
000067 Plant Fire On-site / 9						2.1.25	Obtain/interpret station performance data	2.8	1
000068 Control Room Evac. / 8									
000069 (W/E14) Loss of CTMT Integrity / 5					1		Determine loss of containment integrity	3.7	1
000074 (W/E06&E07) Inad. Core Cooling / 4			2				Maintaining S/G level and pressure within specified limits	3.7	1
000076 High Reactor Coolant Activity / 9				4			Operate/monitor failed fuel-monitoring equipment	3.2	1
K/A Category Totals:	2	2	3	3	3	3	Group Point Total:		16

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1						2.1.25	Obtain/interpret station performance data	2.8	1
000003 Dropped Control Rod / 1	3						Relationship of reactivity and reactor power to rod movement	3.5	1
000007 Reactor Trip - Stabilization - Recovery / 1				3			Operate/monitor RCS pressure and temperature	4.2	1
000008 Pressurizer Vapor Space Accident / 3					22		Consequences of loss of pressure/methods for evaluating loss	3.8	1
000009 Small Break LOCA / 3					25		Reactor Trip setpoints	3.9	1
000011 Large Break LOCA / 3 **(PSA)**				3			Operate/monitor securing of RCPs	4.0	1
W/E04 LOCA Outside Containment / 3	3						Annunciator conditions and remedial actions	3.5	1
W/E03 LOCA Cooldown/Depress. / 4 **(PSA)**		1					Components/functions of control/safety systems	3.6	1
W/E11 Loss of Emergency Coolant Recirc. / 4 **(PSA)**			2				Knowledge of normal/abnormal/emergency procedures	3.5	1
W/E01 & E02 Rediagnosis & SI Termination / 3				1			Operate/monitor components, and functions of control and safety systems	4.0	1
000022 Loss of Reactor Coolant Makeup / 2						2.4.4	Entry-level conditions for emergency/abnormal procedures	4.0	1
000025 Loss of RHR System / 4									
000029 Anticipated Transient w/o Scram / 1			12				Actions contained in EOP for ATWS	4.4	1
000032 Loss of Source Range NI / 7									
000033 Loss of Intermediate Range NI / 7									
000037 Steam Generator Tube Leak / 3									
000038 Steam Generator Tube Rupture / 3	1						Use of steam tables	3.1	1
000054 Loss of Main Feedwater / 4 **(PSA)**									
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 **(PSA)**		2					Interrelations between heat removal systems	3.9	1
000058 Loss of DC Power / 6									
000059 Accidental Liquid RadWaste Rel. / 9						2.4.4	Entry-level conditions for emergency/abnormal procedures	4.0	1
000060 Accidental Gaseous Radwaste Rel. / 9						2.4.31	Annunciator alarms/use of response instructions	3.3	1
000061 ARM System Alarms / 7			2				Guidance in alarm response for ARM system	3.4	1
W/E16 High Containment Radiation / 9									
K/A Category Totals:	3	2	3	3	2	4	Group Point Total:		17

ES-401	PWR RO Examination Outline Emergency and Abnormal Plant Evolutions - Tier 1/Group 3	Form ES-401-4

E/APE # / Name / Safety Function	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2	1						Pressurizer level reference leak abnormalities	2.8	1
000036 Fuel Handling Accident / 8			3				Guidance contained in EOP for fuel handling incident	3.7	1
000056 Loss of Off-site Power / 6									
000065 Loss of Instrument Air / 8					8		Determine/interpret failure modes of air-operated equipment	2.9	1
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									
K/A Category Totals:	1	0	1	0	1	0	Group Point Total:		3

Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive		2										Power supplies to trip breakers	3.6	3
								2				Consequences of loss of power to reactor trip breakers	3.8	
										14		Resetting rod control logic while recovering from misaligned rod	3.0	
003 Reactor Coolant Pump						4						Containment isolation valves affecting RCP operation	2.8	2
							9					RCP seal flow and D/P	2.8	
004 Chemical and Volume Control			1									Loss/malfunction of CVCS on CRDS	2.5	3
					30							Temperature/pressure in CVCS during solid plant operation	3.8	
											2.4.49	Immediate operation of system components and controls	4.0	
013 Engineered Safety Features Actuation	7											Connection/cause-effect between ESFAS and AFW	4.1	3
		1										Power supplies to ESFAS/safeguards control	3.6	
									2			Operation of actuated equipment	4.1	
015 Nuclear Instrumentation			1									Loss/malfunction of NIS on RPS	3.9	2
						2						Loss/malfunction of NIS discriminator/compensation circuits	2.6	
017 In-core Temperature Monitor											2.1.27	Knowledge of system purpose/function	2.8	1
022 Containment Cooling				3								Feature/interlock which provide automatic containment isolation	3.6	2
									1			Initiation of safeguards mode of operation	4.1	
056 Condensate								4				Consequences of loss of condensate pumps	2.6	1
059 Main Feedwater								7				Consequences of tripping of MFW pump	3.0	2
										12		Initiation of automatic feedwater isolation	3.4	
061 Auxiliary/Emergency Feedwater **(PSA)**	7											AFW emergency water source	3.6	2
							4					Predict/monitor changes in AFW source tank level	3.9	
068 Liquid Radwaste									2			Automatic isolation of the Liquid Radwaste System	3.6	1
071 Waste Gas Disposal														
072 Area Radiation Monitoring								1				Consequences of ARM erratic/failed power supply	2.7	1
K/A Category Totals:	2	2	2	1	1	2	2	4	3	2	2	Group Point Total:		23

ES-401	PWR RO Examination Outline Plant Systems - Tier 2/Group 2	Form ES-401-4

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						3						Loss/malfunction of Reactor vessel level indication	3.1	1
006 Emergency Core Cooling				8								Feature/interlock for recirc flowpath of reactor building sump	3.2	1
010 Pressurizer Pressure Control						1						Loss/malfunction of pressure detection systems	2.7	1
011 Pressurizer Level Control					10							Implications of indications of reactor vessel bubble	3.7	1
012 Reactor Protection		1										Power supplies to the RPS channels	3.3	2
							1					RPS trip setpoint adjustment	2.9	
014 Rod Position Indication								2				Consequences of loss of power to RPIS	3.1	1
016 Non-nuclear Instrumentation			1									Loss/malfunction of NNIS on RCS	3.4	1
026 Containment Spray									1			Operation of pump starts and correct MOV positioning	4.3	1
029 Containment Purge				3								Feature/interlock for automatic purge isolation	3.2	1
033 Spent Fuel Pool Cooling				3								Feature/interlock for anti-siphon devices	2.6	1
035 Steam Generator	12											Connection/cause-effect between S/GS and RPS	3.7	1
039 Main and Reheat Steam									2			Operation of isolation of the MRSS	3.1	1
062 AC Electrical Distribution		1										Knowledge of bus power supplies	3.3	1
063 DC Electrical Distribution											2.1.11	Less than one hour technical specification action statements	3.0	1
064 Emergency Diesel Generator										6		Operate/monitor manual start, loading, and stopping of ED/G	3.9	1
073 Process Radiation Monitoring	1											Connection/cause-effect of systems served by PRMs	3.6	1
075 Circulating Water											2.1.20	Execute procedure steps	4.3	1
079 Station Air	1											Connections/cause-effect relationships between the SAS and IAS	3.0	1
086 Fire Protection								2				Consequence of low FPS header pressure	3.0	1
K/A Category Totals:	3	2	1	3	1	2	1	2	2	1	2	Group Point Total:		20

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal			1									Loss/malfunction of RHRS on RCS	3.9	1
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water				1								Feature/interlock for automatic start of standby pump	3.1	1
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control								1				Hydrogen recombiner power setting using plant data book	3.4	1
034 Fuel Handling Equipment														
041 Steam Dump/Turbine Bypass Control				14								Operation of loss-of-load bistable taps upon turbine load loss	2.5	1
045 Main Turbine Generator											2.1.20	Execute procedure steps	4.3	1
076 Service Water	16											Connections/cause-effect between SWS and ESF	3.6	1
078 Instrument Air		1										Power supplies to Instrument air compressor	2.7	1
103 Containment	8											Connection/cause-effect between containment and SIS	3.6	1
K/A Category Totals:	2	1	1	2	0	0	0	1	0	0	1	Group Point Total:		8

Plant-Specific Priorities

System/Topic	Recommended Replacement for ...	Reason	Points
Plant-Specific Priority Total: (limit 10)			

Facility: **SHNPP**	Date of Exam: **11-Dec-00**		Exam Level: **RO**	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Conduct of operations requirements	3.7	1
	2.1.3	Knowledge of shift turnover practices	3.0	1
	2.1.18	Logs, records, status boards, and reports	2.9	1
	2.1.29	Conduct and verify valve lineups	3.4	1
	Total			4
Equipment Control	2.2.11	Process for controlling temporary changes	2.5	1
	2.2.12	Knowledge of surveillance procedures	3.0	1
	2.2.13	Knowledge of tagging and clearance procedures	3.6	1
	Total			3
Radiation Control	2.3.4	Radiation exposure limits/contamination control, including permissible levels	2.5	1
	2.3.10	Procedures to reduce radiation/personnel exposure	2.9	1
	Total			2
Emergency Procedures/ Plan	2.4.3	Identify post-accident instrumentation	3.5	1
	2.4.14	General guidelines for EOP flowchart use	3.0	1
	2.4.16	EOP implementation hierarchy/coordination with other procedures	3.0	1
	2.4.32	Response to loss of all annunciators	3.3	1
	Total			4
Tier 3 Point Total				13

Facility: **SHNPP** Date of Exam: **11-Dec-00** Exam Level: **SRO**

Tier	Group	K/A Category Points K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Point Total
1 Emergency & Abnormal Plant Evolutions	1	4	2	4				4	4			6	24
	2	1	2	2				1	8			2	16
	3	1	0	1				0	1			0	3
	Tier Totals	6	4	7				5	13			8	43
2 Plant Systems	1	1	2	2	0	1	1	1	5	3	1	2	19
	2	2	1	1	3	1	1	1	2	1	1	3	17
	3	1	0	1	1	0	0	0	0	0	0	1	4
	Tier Totals	4	3	4	4	2	2	2	7	4	2	6	40

3 Generic Knowledge and Abilities	Cat 1	Cat 2	Cat 3	Cat 4	
	5	4	3	5	17

Notes:

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).
2. Actual point totals must match those specified in the table.
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.
4. Systems/evolutions within each group are identified on the associated outline.
5. The shaded areas are not applicable to the category/tier.

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.

7. On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings for the SRO license level, and the point totals for each system and category. K/As below 2.5 should be justified on the basis of plant-specific priorities. Enter the tier totals for each category in the table above.
8. Shaded K/As on the following pages indicate that the related questions appear ONLY on the SRO examination.

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1						2.1.25	Obtain/interpret station performance data	3.1	1
000003 Dropped Control Rod / 1	3						Relationship of reactivity and reactor power to rod movement	3.8	1
000005 Inoperable/Stuck Control Rod / 1			5				Power limits on rod misalignment	4.2	1
000011 Large Break LOCA / 3 **(PSA)**				3			Operate/monitor securing of RCPs	4.0	1
W/E04 LOCA Outside Containment / 3	3						Annunciator conditions and remedial actions	3.9	1
W/EO1 & E02 Rediagnosis & SI Termination / 3					1		Selection of procedures during abnormal/emergency operations	4.2	1
000015/17 RCP Malfunctions / 4					9		Determine/interpret when to secure RCPs on high temperatures	3.5	1
W/E09&E10 Natural Circ. / 4		2					Interrelations between heat removal systems	3.9	1
000024 Emergency Boration / 1		1					Interrelations between Emergency Boration and valves	2.7	1
000026 Loss of Component Cooling Water / 8						2.4.24	Loss of cooling water procedures	3.7	1
000029 Anticipated Transient w/o Scram / 1			12				Actions contained in EOP for ATWS	4.7	2
						2.4.16	EOP implementation hierarchy/coordination with other procedures	4.0	
000040 (W/E12) Steam Line Rupture - Excessive Heat Transfer / 4			2				Knowledge of normal/abnormal/emergency procedures	3.9	1
W/E08 RCS Overcooling - PTS / 4	2						Knowledge of normal/abnormal/emergency procedures	4.0	1
000051 Loss of Condenser Vacuum / 4						2.4.11	Knowledge of abnormal procedures	3.6	1
000055 Station Blackout / 6	2						Implication of natural circulation cooling	4.4	1
000057 Loss of Vital AC Elec. Inst. Bus / 6				5			Operate/monitor backup instrument indications	3.4	1
000059 Accidental Liquid RadWaste Rel. / 9						2.4.4	Entry-level conditions for emergency/abnormal procedures	4.3	1
000062 Loss of Nuclear Service Water / 4				5			CCWS surge tank level control/alarms and radiation alarm	3.1	1
000067 Plant Fire On-site / 9						2.4.27	Knowledge of fire procedure	3.5	1
000069 (W/E14) Loss of CTMT Integrity / 5					1		Selection of procedures during abnormal/emergency operations	3.8	1
000074 (W/E06&E07) Inad. Core Cooling / 4			2				Maintaining S/G level and pressure within specified limits	4.2	2
					1		Selection of procedures during abnormal/emergency operations	4.2	
000076 High Reactor Coolant Activity / 9				4			Operate/monitor failed fuel-monitoring equipment	3.4	1
K/A Category Totals:	4	2	4	4	4	6	Group Point Total:		24

ES-401 PWR SRO Examination Outline Form ES-401-3

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000007 Reactor Trip - Stabilization - Recovery / 1				3			Operate/monitor RCS pressure and temperature	4.1	1
000008 Pressurizer Vapor Space Accident / 3					22		Consequences of loss of pressure/methods for evaluating loss	4.2	1
000009 Small Break LOCA / 3					39		Determine/interpret Adequate Core Cooling	4.7	1
W/E03 LOCA Cooldown - Depress. / 4 **(PSA)**		1					Components/functions of control/safety systems	4.0	1
W/E11 Loss of Emergency Coolant Recirc. / 4 **(PSA)**			2				Knowledge of normal/abnormal/emergency procedures	4.0	2
					1		Selection of procedures during abnormal/emergency operations	4.2	
000022 Loss of Reactor Coolant Makeup / 2						2.4.4	Entry-level conditions for emergency/abnormal procedures	4.3	1
000025 Loss of RHR System / 4									
000027 Pressurizer Pressure Control System Malfunction / 3					15		Actions taken if PZR pressure instrument fails	4.0	1
000032 Loss of Source Range NI / 7					1		Source Range normal/abnormal power supply operation	2.9	1
000033 Loss of Intermediate Range NI / 7									
000037 Steam Generator Tube Leak / 3					10		Tech-Spec limits for RCS leakage	4.1	1
000038 Steam Generator Tube Rupture / 3	1						Use of steam tables	3.4	1
000054 Loss of Main Feedwater / 4 **(PSA)**									
W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4 **(PSA)**		2					Interrelations between heat removal systems	4.2	2
					2		Adherence to procedures and operation within limitations	4.3	
000058 Loss of DC Power / 6									
000060 Accidental Gaseous Radwaste Rel. / 9						2.4.31	Annunciator alarms/use of response instructions	3.4	1
000061 ARM System Alarms / 7			2				Guidance in alarm response for ARM system	3.6	1
W/E16 High Containment Radiation / 9									
000065 Loss of Instrument Air / 8					8		Determine/interpret failure modes of air-operated equipment	3.3	1
K/A Category Totals:	1	2	2	1	8	2	Group Point Total:		16

ES-401 PWR SRO Examination Outline Form ES-401-3

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	E/AK1	E/AK2	E/AK3	E/AA1	E/AA2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2	1						Pressurizer level reference leak abnormalities	3.1	1
000036 Fuel Handling Accident / 8			3				Guidance contained in EOP for fuel handling incident	4.1	1
000056 Loss of Off-site Power / 6					47		Proper operation of the ED/G load sequencer	3.9	1
W/E13 Steam Generator Over-pressure / 4									
W/E15 Containment Flooding / 5									
K/A Category Totals:	1	0	1	0	1	0	Group Point Total:		3

Plant Systems - Tier 2/Group 1

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive		2										Power supplies to trip breakers	3.7	3
								12				Consequences of erroneous ECP calculation	4.2	
										14		Resetting rod control logic while recovering from misaligned rod	3.4	
003 Reactor Coolant Pump						4						Containment isolation valves affecting RCP operation	3.1	1
004 Chemical and Volume Control			1									Loss/malfunction of CVCS on CRDS	2.9	2
					30							Temperature/pressure in CVCS during solid plant operation	4.2	
013 Engineered Safety Features Actuation	7											Connection/cause-effect between ESFAS and AFW	4.4	2
		1										Power supplies to ESFAS/safeguards control	3.8	
014 Rod Position Indication								2				Consequences of loss of power to RPIS	3.6	1
015 Nuclear Instrumentation			1									Loss/malfunction of NIS on RPS	4.3	1
017 In-core Temperature Monitor											2.1.27	Knowledge of system purpose/function	2.9	1
022 Containment Cooling									1			Initiation of safeguards mode of operation	4.3	1
026 Containment Spray									1			Operation of pump starts and correct MOV positioning	4.5	1
056 Condensate								4				Consequences of loss of condensate pumps	2.8	1
059 Main Feedwater								4				Consequences of feeding a dry SG	3.4	1
061 Auxiliary/Emergency Feedwater **(PSA)**							4					Predict/monitor changes in AFW source tank level	3.9	1
063 DC Electrical Distribution											2.1.11	Less than one hour technical specification action statements	3.8	1
068 Liquid Radwaste									2			Automatic isolation of the Liquid Radwaste System	3.6	1
071 Waste Gas Disposal														
072 Area Radiation Monitoring								1				Consequences of ARM erratic/failed power supply	2.9	1
K/A Category Totals:	1	2	2	0	1	1	1	5	3	1	2	Group Point Total:		19

ES-401 PWR SRO Examination Outline Form ES-401-3

Plant Systems - Tier 2/Group 2

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant											2.1.25	Obtain/interpret station performance data	3.1	1
006 Emergency Core Cooling				8								Feature/interlock for recirc flowpath of reactor building sump	3.6	1
010 Pressurizer Pressure Control						1						Loss/malfunction of pressure detection systems	3.1	1
011 Pressurizer Level Control					10							Implications of indications of reactor vessel bubble	4.0	1
012 Reactor Protection		1										Power supplies to the RPS channels	3.7	2
							1					RPS trip setpoint adjustment	3.4	
016 Non-nuclear Instrumentation			1									Loss/malfunction of NNIS on RCS	3.6	1
027 Containment Iodine Removal														
028 Hydrogen Recombiner and Purge Control								1				Hydrogen recombiner power setting using plant data book	3.6	1
029 Containment Purge				3								Feature/interlock for automatic purge isolation	3.5	1
033 Spent Fuel Pool Cooling				3								Feature/interlock for anti-siphon devices	2.9	1
034 Fuel Handling Equipment														
035 Steam Generator	12											Connection/cause-effect between S/GS and RPS	3.9	1
039 Main and Reheat Steam									2			Operation of isolation of the MRSS	3.5	1
055 Condenser Air Removal														
062 AC Electrical Distribution											2.1.12	Apply technical specifications	4.0	1
064 Emergency Diesel Generator										6		Operate/monitor manual start, loading, and stopping of ED/G	3.9	1
073 Process Radiation Monitoring														
075 Circulating Water											2.1.20	Execute procedure steps	4.2	1
079 Station Air														
086 Fire Protection								2				Consequence of low FPS header pressure	3.3	1
103 Containment	8											Connection/cause-effect between containment and SIS	3.8	1
K/A Category Totals:	2	1	1	3	1	1	1	2	1	1	3	Group Point Total:		17

Plant Systems - Tier 2/Group 3

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal			1									Loss/malfunction of RHRS on RCS	4.0	1
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water				1								Feature/interlock for automatic start of standby pump	3.3	1
041 Steam Dump/Turbine Bypass Control														
045 Main Turbine Generator											2.1.20	Execute procedure steps	4.2	1
076 Service Water	16											Connections/cause-effect between SWS and ESF	3.8	1
078 Instrument Air														
K/A Category Totals:	1	0	1	1	0	0	0	0	0	0	1	Group Point Total:		4

Plant-Specific Priorities

System/Topic	Recommended Replacement for ...	Reason	Points
Plant-Specific Priority Total: (limit 10)			

Facility: **SHNPP**	Date of Exam: **11-Dec-00**			Exam Level: **SRO**
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Conduct of operations requirements	3.8	1
	2.1.3	Knowledge of shift turnover practices	3.4	1
	2.1.14	Status criteria which require notification of plant personnel	3.3	1
	2.1.33	Entry-level conditions for technical specifications	4.0	1
	2.1.34	Maintain plant chemistry within allowable limits	2.9	1
	Total			5
Equipment Control	2.2.11	Process for controlling temporary changes	3.4	1
	2.2.17	Process for managing maintenance activities	3.5	1
	2.2.21	Knowledge of maintenance operability requirements	3.5	1
	2.2.26	Refueling administrative requirements	3.7	1
	Total			4
Radiation Control	2.3.1	Knowledge of 10CFR20 and related facility radiation control requirements.	3.0	1
	2.3.4	Radiation exposure limits/contamination control, including permissible levels	3.1	1
	2.3.10	Procedures to reduce radiation/personnel exposure	3.3	1
	Total			3
Emergency Procedures/ Plan	2.4.6	Symptom based EOP mitigation strategies	4.0	1
	2.4.14	General guidelines for EOP flowchart use	3.9	1
	2.4.26	Requirements including fire brigade/equipment	3.3	1
	2.4.30	Operations/status reported to outside agencies	3.6	1
	2.4.32	Response to loss of all annunciators	3.5	1
	Total			5
Tier 3 Point Total				17

Methodology for Selecting KAs for RO and SRO Written Examinations

RO EXAMINATION SELECTION

1) Enter ALL NUREG-1122, Revision 2, KAs into electronic database.

2) Assign generic KAs that are applicable to individual systems and E/APEs an associated KA number. Maintain RO and SRO importance factors (i.e., 2.4.31, "Knowledge of annunciators, alarms and indications, and use of the alarm response instructions," is assigned to all Systems and E/APEs to which it may be applied, numbered as System/E/APE followed by the generic number, 0362.4.31).

3) Provide a Random Number Generator field to electronic database.

4) Allow electronic database to generate random numbers assigned to each KA.

5) Sort electronic database by random number field.

6) Select first KA sorted by random number.

7) Insert into appropriate field in ES-401-4, and ES-401-5 (RO) based on the following criteria:

   a) If RO importance is ≥ 2.5, select as topic applicable to RO examination, labeling the KA as "SELECTED".

   b) If RO importance is <2.5, discard selection and progress to next randomly selected KA, labeling the KA as "NOT SELECTED – KA < 2.5".

   c) If KA is not applicable to Westinghouse plants, and to SHNPP in particular, discard selection and progress to next randomly selected KA, labeling the KA as "NOT SELECTED – NOT WESTINGHOUSE," or "NOT SELECTED – NOT APPLICABLE TO PLANT," as appropriate.

8) Ensure Categories in each Tier are addressed by at least two KAs and Category distribution within each Group in each Tier are distributed evenly by:

   a) Determining total number of KAs in each Group within a Tier and dividing this value by the number of categories in the Group (i.e., ES-401-4, Tier 2/Group 1, requires 23 topics covered and there are 11 categories in Tier 1/Group 2. Dividing this results in a value of 2.10).

b) The maximum number of allowed KAs selected in any one category within a Tier/Group is determined by increasing the value calculated in Step 8a above to the next second highest integer (i.e., 4 KAs in the above example). If the calculated value in Step 8a is an integer, increase by 2 to determine the maximum.

c) The minimum number of allowed KAs selected in any one category within a Tier/Group is determined by decreasing the value calculated in Step 8a above to the next second lowest integer (i.e., 1 KA in the above example). If the calculated value in Step 8a is an integer, decrease by 2 to determine the minimum.

9) Continue process described in Step 7 above, limiting each System/E/APE to no more than 3 KAs, but attempting to provide an even distribution of all System/E/APEs.

10) Once the required number of KAs in a Category and/or System/E/APE has been randomly selected, discard any further selected KAs that would meet the criteria for selection, identifying the KA as "NOT SELECTED – PREVIOUSLY ADDRESSED ADEQUATELY".

11) Once the required number of KAs in a Tier/Group has been randomly selected, filter remainder of database to eliminate selection of any further KAs from the filled Tier/Group.

12) Continue this process until 100 KAs have been selected.

13) After selection of simulator scenario tasks, plant walk-through JPMs, and administrative JPMs, review entire examination for excessive coverage of topic areas. If determined that excessive coverage of topic area exists, either replace task/JPM or KA from written examination. If KA from written examination replaced, label as "REPLACED – EXCESSIVE COVERAGE." Randomly select a replacement KA from same Tier/Group as described previously, filtering to ensure KA is associated with Tier/Group. Label replacement KA as "REPLACEMENT – EXCESSIVE COVERAGE." Note that this process is performed after completion of entire draft examination outline for both RO and SRO candidates.

SRO EXAMINATION SELECTION

1) Transfer ALL KA selections from RO Examination Outline (ES-401-4 and ES-401-5) to SRO Examination Outline (ES-401-3 and ES-401-5).

2) Filter database selection as follows:

a) Identify only those KAs which are from Categories EA2, AA2, and G in Tier 1.

b) Identify only those KAs which are from Categories A2 and G in Tier 2.

c) Identify only those KAs which have ties to 10CFR55.43(b) in Tier 3.

3) Randomly select 15 additional KAs from database for Tiers 1 and 2 as described in Steps 2a and 2b above.

4) Enter selected KAs from database in SRO Examination Outline, Tiers 1 and 2.

5) Randomly select 10 additional KAs from database for Tier 3 as described in Step 2c above.

6) Enter selected KAs from database in SRO Examination Outline, Tier 3.

7) Select transferred KAs for System/E/APE for deletion which correspond to randomly selected SRO KAs for Tiers 1 and 2, labeling as "DELETED - CORRESPONDS TO SRO SELECTION." Where more than one KA has been transferred to SRO Examination Outline which corresponds to a System/E/APE selection for SROs, randomly select one of the transferred KAs for deletion, labeling as "DELETED - CORRESPONDS TO SRO SELECTION/RANDOM SELECTION." Performed by entering transferred KAs into separate electronic database, allowing random number generator to assign random numbers to each, and selecting associated transferred KAs by random number order of lowest to highest until point distribution correct.

8) Randomly select additional transferred KAs for deletion as necessary to ensure SRO Examination Outline meets required point distribution for Tiers 1 and 2, labeling as "DELETED." Performed by entering transferred KAs into separate electronic database, allowing random number generator to assign random numbers to each, and selecting associated transferred KAs by random number order of lowest to highest until point distribution correct.

9) Randomly select transferred KAs for deletion as necessary to ensure SRO Examination Outline meets required point distribution for Tier 3, labeling as "DELETED." Performed by entering transferred KAs into separate electronic database, allowing random number generator to assign random numbers to each, and selecting associated transferred KAs by random number order of lowest to highest until point distribution correct.

10) After selection of simulator scenario tasks, plant walk-through JPMs, and administrative JPMs, review entire examination for excessive coverage of topic areas. If determined that excessive coverage of topic area exists, either relace task/JPM or KA from written examination. If KA from written examination replaced, label as "REPLACED – EXCESSIVE COVERAGE." Randomly select a replacement KA from same Tier/Group as described previously, filtering to ensure KA is associated with Tier/Group. Label replacement KA as "REPLACEMENT – EXCESSIVE COVERAGE." Note that this process is performed after completion of entire draft examination outline for both RO and SRO candidates.

RANDOMLY SELECT 100 KA TOPICS FOR RO EXAM WHICH MEET USE CRITERIA AND PROVIDE CORRECT POINT DISTRIBUTION	
KA TOPIC	DISPOSITION
062AA1.05	SELECTED
068K6.07	NOT SELECTED - KA < 2.5
BE13EK1.3	NOT SELECTED - NOT WESTINGHOUSE
2.1.1	SELECTED
WE04EK1.3	SELECTED
062AA2.06	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
063K1.01	NOT SELECTED - KA < 2.5
072A2.01	SELECTED
055K2.01	NOT SELECTED - KA < 2.5
WE04EK2.1	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
007EK2.01	NOT SELECTED - KA < 2.5
013K1.07	SELECTED
024AK2.01	SELECTED
045K6.01	NOT SELECTED - KA < 2.5
005K3.01	SELECTED
011EK2.01	NOT SELECTED - KA < 2.5
007K6.05	NOT SELECTED - KA < 2.5
056A3.05	NOT SELECTED - KA < 2.5
072A4.03	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
0452.1.20	SELECTED
BA06AK3.03	NOT SELECTED - NOT WESTINGHOUSE
WE08EK1.2	SELECTED
045A2.17	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
103K1.08	SELECTED
028AK2.06	NOT SELECTED - KA < 2.5
026AA2.05	NOT SELECTED - KA < 2.5
0512.4.11	SELECTED
0172.1.27	SELECTED
035K4.06	NOT SELECTED - KA < 2.5
2.3.10	SELECTED
004K5.30	SELECTED
103A4.03	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
0222.4.4	SELECTED
026A4.03	NOT SELECTED - KA < 2.5
056K4.17	NOT SELECTED - KA < 2.5
001K6.06	NOT SELECTED - KA < 2.5
045A4.01	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
011EA1.03	SELECTED
056K5.03	NOT SELECTED - KA < 2.5
0592.4.4	SELECTED
003AK1.18	NOT SELECTED - KA < 2.5
076AA1.04	SELECTED
103A2.04	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
071K6.06	NOT SELECTED - KA < 2.5
103A4.02	NOT SELECTED - KA < 2.5
027AK2.04	NOT SELECTED - KA < 2.5
BA07AA1.3	NOT SELECTED - NOT WESTINGHOUSE
071A4.26	SELECTED
045K5.22	NOT SELECTED - KA < 2.5
103K6.02	NOT SELECTED - KA < 2.5
039A4.02	NOT SELECTED - KA < 2.5
2.4.32	SELECTED

KA TOPIC	DISPOSITION
076AA2.05	NOT SELECTED - KA < 2.5
061AK3.02	SELECTED
WE11EK3.2	SELECTED
2.3.8	NOT SELECTED - KA < 2.5
CE05EK1.1	NOT SELECTED - NOT WESTINGHOUSE
0012.1.25	SELECTED
012K2.01	SELECTED
061AA2.06	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
028AK1.01	SELECTED
007A4.07	NOT SELECTED - KA < 2.5
056A2.04	SELECTED
025A3.01	NOT SELECTED - NOT APPLICABLE TO PLANT
071A4.29	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
028AA2.13	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
028A2.01	SELECTED
BE10EA2.2	NOT SELECTED - NOT WESTINGHOUSE
BA01AA1.3	NOT SELECTED - NOT WESTINGHOUSE
017K2.01	NOT SELECTED - KA < 2.5
008A2.09	NOT SELECTED - KA < 2.5
WE11EA2.1	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
CA13AK2.2	NOT SELECTED - NOT WESTINGHOUSE
004K5.05	NOT SELECTED - KA < 2.5
2.4.14	SELECTED
015K3.01	SELECTED
015/017AK2.03	NOT SELECTED - KA < 2.5
025AA1.16	NOT SELECTED - KA < 2.5
028AA1.05	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
057AA1.05	SELECTED
033AA2.13	NOT SELECTED - KA < 2.5
051AA2.02	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
026A3.01	SELECTED
008AA2.22	SELECTED
029K2.05	NOT SELECTED - KA < 2.5
013K2.01	SELECTED
035K1.12	SELECTED
028A4.01	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
056K1.10	NOT SELECTED - KA < 2.5
026A1.03	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
029K4.03	SELECTED
0602.4.31	SELECTED
026A4.01	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
027AA2.15	SELECTED
005K6.08	NOT SELECTED - KA < 2.5
WE03EK2.1	SELECTED
067AK2.03	NOT SELECTED - KA < 2.5
039A3.02	SELECTED
005AK3.05	SELECTED
WE12EK3.2	SELECTED
029K6.07	NOT SELECTED - KA < 2.5
012A1.01	SELECTED
076A4.03	NOT SELECTED - KA < 2.5
004K3.01	SELECTED
103K1.06	NOT SELECTED - KA < 2.5
006K4.08	SELECTED

KA TOPIC	DISPOSITION
2.2.11	SELECTED
076A4.05	NOT SELECTED - KA < 2.5
2.1.3	SELECTED
012A2.06	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
055EK1.02	SELECTED
2.3.4	SELECTED
003AK1.03	SELECTED
006A4.07	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
086A2.02	SELECTED
WE03AK1.1	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
064A4.06	SELECTED
103K1.06	NOT SELECTED - KA < 2.5
001K4.22	NOT SELECTED - KA < 2.5
056K6.09	NOT SELECTED - KA < 2.5
086K3.01	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
068A1.02	NOT SELECTED - KA < 2.5
026K1.04	NOT SELECTED - KA < 2.5
BE05EK1.3	NOT SELECTED - NOT WESTINGHOUSE
005K5.08	NOT SELECTED - KA < 2.5
055EA2.04	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
076K1.16	SELECTED
086K6.03	NOT SELECTED - KA < 2.5
074EK3.02	SELECTED
078A2.01	NOT SELECTED - KA < 2.5
0752.1.20	SELECTED
060AA2.05	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
015K6.06	NOT SELECTED - KA < 2.5
015/017AA2.09	SELECTED
056A4.13	NOT SELECTED - KA < 2.5
011K5.14	NOT SELECTED - KA < 2.5
0262.4.24	SELECTED
008K4.01	SELECTED
076A2.01	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
CA16AA1.3	NOT SELECTED - NOT WESTINGHOUSE
036AK3.03	SELECTED
008K5.01	NOT SELECTED - KA < 2.5
BE14EK3.3	NOT SELECTED - NOT WESTINGHOUSE
005K4.04	NOT SELECTED - KA < 2.5
001K5.89	NOT SELECTED - KA < 2.5
011K5.10	SELECTED
029EK3.12	SELECTED
075K6.06	NOT SELECTED - KA < 2.5
WE05EK2.2	SELECTED
045A2.09	NOT SELECTED - KA < 2.5
015/017AK3.03	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
065AA2.08	SELECTED
TIER/GROUP 1/3 COMPLETE - FILTER OUT REMAINING K/As RELATED TO TIER/GROUP 1/3	
0632.1.11	SELECTED
068K4.01	SELECTED
075K6.02	NOT SELECTED - KA < 2.5
061AK3.01	NOT SELECTED - KA < 2.5
001K2.02	SELECTED
022A3.01	SELECTED
061K1.06	NOT SELECTED - KA < 2.5

KA TOPIC	DISPOSITION
015/017AA1.21	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
013A3.02	SELECTED
WE05EA1.2	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
076A2.01	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
038EK1.01	SELECTED
014A2.02	SELECTED
075A4.12	NOT SELECTED - KA < 2.5
015K5.08	NOT SELECTED - KA < 2.5
003K6.04	SELECTED
075K5.08	NOT SELECTED - KA < 2.5
007EA1.03	SELECTED
103A1.01	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
0112.4.31	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
068AK3.15	NOT SELECTED - KA < 2.5
013A3.03	NOT SELECTED - KA < 2.5
WE09EK2.2	SELECTED
061A1.04	SELECTED
010K6.01	SELECTED
004K4.05	NOT SELECTED - KA < 2.5
016K3.01	SELECTED
062K5.01	NOT SELECTED - KA < 2.5
035A4.06	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
061A3.06	NOT SELECTED - KA < 2.5
029EK2.04	NOT SELECTED - KA < 2.5
037AK3.01	NOT SELECTED - KA < 2.5
2.1.29	SELECTED
028K1.02	NOT SELECTED - KA < 2.5
079K1.01	SELECTED
025AA1.15	NOT SELECTED - KA < 2.5
BA01AK2.2	NOT SELECTED - NOT WESTINGHOUSE
BA05AK2.1	NOT SELECTED - NOT WESTINGHOUSE
029EK1.04	NOT SELECTED - KA < 2.5
2.4.16	SELECTED
2.2.13	SELECTED
016K4.02	NOT SELECTED - KA < 2.5
045A1.04	NOT SELECTED - KA < 2.5
WE02EA1.1	SELECTED
103K6.03	NOT SELECTED - KA < 2.5
041K4.14	SELECTED
041A3.04	NOT SELECTED - KA < 2.5
001A2.02	SELECTED
003A1.09	SELECTED
058AK2.01	NOT SELECTED - KA < 2.5
009EA2.25	SELECTED
TIER/GROUP 1/2 COMPLETE - FILTER OUT REMAINING K/As RELATED TO TIER/GROUP 1/2	
004A2.31	NOT SELECTED - KA < 2.5
BE13EA1.1	NOT SELECTED - NOT WESTINGHOUSE
2.1.18	SELECTED
059A2.07	SELECTED
022K4.03	SELECTED
056AA2.79	NOT SELECTED - KA < 2.5
BA02AA2.1	NOT SELECTED - NOT WESTINGHOUSE
0672.1.25	SELECTED
056K3.07	NOT SELECTED - KA < 2.5

KA TOPIC	DISPOSITION
2.2.12	SELECTED
056K5.09	NOT SELECTED - KA < 2.5
062K2.01	SELECTED
063A2.02	NOT SELECTED - KA < 2.5
0042.4.49	SELECTED
069AA2.01	SELECTED
TIER/GROUP 1/1 COMPLETE - FILTER OUT REMAINING K/As RELATED TO TIER/GROUP 1/1	
059A4.12	SELECTED
2.4.3	SELECTED
TIER/GROUP 3 COMPLETE - FILTER OUT REMAINING K/As RELATED TO TIER/GROUP 3	
061K1.07	SELECTED
033K5.02	NOT SELECTED - KA < 2.5
078K2.01	SELECTED
TIER/GROUP 2/3 COMPLETE - FILTER OUT REMAINING K/As RELATED TO TIER/GROUP 2/3	
041K6.06	NOT SELECTED - KA < 2.5
029A3.01	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
073K1.01	SELECTED
002K6.03	SELECTED
TIER/GROUP 2/2 COMPLETE - FILTER OUT REMAINING K/As RELATED TO TIER/GROUP 2/2	
013A1.04	NOT SELECTED - PREVIOUSLY ADDRESSED ADEQUATELY
015K6.02	SELECTED
TIER/GROUP 2/1 COMPLETE - RO SELECTION COMPLETE	
RANDOMLY SELECT 15 SRO KA TOPICS WHICH ARE LIMITED TO TIER 1 AND 2 A2/EA2/AA2/G TOPICS AND MEET OTHER KA USE CRITERIA	
KA TOPIC	**DISPOSITION**
032AA2.01	SELECTED
0292.4.16	SELECTED
0622.1.12	SELECTED
0672.4.27	SELECTED
056AA2.47	SELECTED
WE06EA2.1	SELECTED
WE14EA2.1	SELECTED
037AA2.10	SELECTED
WE05EA2.2	SELECTED
001A2.12	SELECTED
WE02EA2.1	SELECTED
0022.1.25	SELECTED
009EA2.39	SELECTED
059A2.04	SELECTED
WE11EA2.1	SELECTED
RANDOMLY SELECT 10 SRO KA TOPICS WHICH ARE LIMITED TO TIER 3 AND MEET OTHER KA USE CRITERIA	
2.4.30	SELECTED
2.4.6	SELECTED
2.1.34	SELECTED
2.1.33	SELECTED
2.1.14	SELECTED
2.3.1	SELECTED
2.2.17	SELECTED
2.4.26	SELECTED
2.2.21	SELECTED
2.2.26	SELECTED

SELECT FOR DELETION APPROPRIATE NUMBER OF RO KA TOPICS FROM TIER 1 AND 2 TO PROVIDE CORRECT POINT DISTRIBUTION FOR SRO TIER/GROUPS. WHERE POSSIBLE, SELECT SAME SYSTEM FOR DELETION AS ADDED. IF NOT POSSIBLE, RANDOMLY SELECT FOR DELETION.	
KA TOPIC	**DISPOSITION**
WE02EA1.1	DELETED - CORRESPONDS TO SRO SELECTION
0672.1.25	DELETED - CORRESPONDS TO SRO SELECTION
069AA2.01	DELETED - CORRESPONDS TO SRO SELECTION
009EA2.25	DELETED - CORRESPONDS TO SRO SELECTION
001A2.02	DELETED - CORRESPONDS TO SRO SELECTION/RANDOM SELECTION
059A2.07	DELETED - CORRESPONDS TO SRO SELECTION/RANDOM SELECTION
002K6.03	DELETED - CORRESPONDS TO SRO SELECTION
062K2.01	DELETED - CORRESPONDS TO SRO SELECTION
0042.4.49	DELETED
022K4.03	DELETED
059A4.12	DELETED
003A1.09	DELETED
015K6.02	DELETED
061K1.07	DELETED
013A3.02	DELETED
073K1.01	DELETED
079K1.01	DELETED
078K2.01	DELETED
041K4.14	DELETED
RANDOMLY SELECT FOR DELETION APPROPRIATE NUMBER OF RO KA TOPICS FROM TIER 3 TO PROVIDE CORRECT POINT DISTRIBUTION FOR SRO TIER/GROUPS	
2.2.12	DELETED
2.1.18	DELETED
2.4.16	DELETED
2.2.13	DELETED
2.1.29	DELETED
2.4.3	DELETED
REPLACEMENT OF KA TOPICS DUE TO EXCESSIVE COVERAGE OF TOPIC AREA	
071A4.26	REPLACED – EXCESSIVE COVERAGE - Gas releases also covered by KA 0602.4.31 and Administrative JPM.
001A4.14	REPLACEMENT – EXCESSIVE COVERAGE

INITIAL SUBMITTAL

HARRIS EXAM 2000-301

DECEMBER 11 - 15, 2000

INITIAL SUBMITTAL

OPERATING TEST
SIMULATOR SCENARIOS

Facility: **SHNPP** Scenario Number: **2** Op-Test Number: 2000-301

Examiners

Operators
(S3)
(R3)
(R1)

Objectives: To evaluate the candidates' ability to perform a power reduction at EOL. To evaluate the candidates' ability to respond to a trip of a Main Feedwater Pump, resulting in a turbine runback, a controlling channel of SG pressure failure, a trip of the running CCW Pump with a failure of the standby pump to automatically start, and a Tavg Median failure. To evaluate the response to a spurious main turbine trip with a subsequent failure of the reactor to trip automatically. EOP implementation will be evaluated based upon the candidates' ability to respond to the reactor trip, followed by a Loss of Offsite Power. Post-trip response will be evaluated based on a trip of the available motor-driven AFW pump and a subsequent overspeed trip of the turbine-driven AFW pump, resulting in a loss of heat sink event.

Initial Conditions: IC-15. 80% power EOL; Equipment out of service is EDG 1A-SA.

Turnover: 80% power, EOL. Core burnup is 439 EFPD.

Equipment out-of-service is EDG 1A-SA. Technical Specification 3.8.1.1.b was entered 14 hours ago.

Boron concentration is 271 ppm. Bank D rods are at 199 steps. 'A' BTRS demineralizer is aligned for service.

Shift orders are to continue the plant shutdown at a rate not to exceed 5 MW/min, but to be in Hot Standby within the next 6 hours. GP-006 has been completed through Step 7.

Event Number	Malfunction Number (1)	Event Type*	Event Description
1	NA	BOP(N) SRO(N)	Down Power Ramp
		RO(R) SRO(R)	Control of reactivity during down power ramp

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Event Number	Malfunction Number	Event Type*	Event Description
2	CFW-16B	BOP(C) SRO(C)	Main Feedwater Pump 'B' trip
		RO(R) SRO(R)	Control of reactivity during turbine runback
3	PT-494 @ 1300	BOP(I) SRO(I)	Controlling Channel of SG C pressure high failure
4	CCW-1A	RO(C) SRO(C)	Operating CCW Pump Trip with failure of standby pump to automatically start
	MRF CCWO 47 0 0	RO(C) SRO(C)	(Failure of standby pump to automatically start)
5	RCS-6A @ 650	RO(I) SRO(I)	High failure of RCS Median Select T-avg circuit
6	TUR-1	RO(C) SRO(C)	Spurious turbine trip concurrent with failure of reactor to automatically trip
	RPS-1B	RO(C) SRO(C)	(Failure of reactor to automatically trip)
7	CFW-1B	BOP(C) SRO(C)	Trip of AFW Pump 1B-SB breaker
8	EPS-1	RO(M) BOP(M) SRO(M)	Loss of Offsite Power
9	CFW-1C	RO(M) BOP(M) SRO(M)	Overspeed trip of Turbine Driven AFW Pump resulting in loss of heat sink

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Facility: **SHNPP** Scenario Number: **3** Op-Test Number: 2000-301

Examiners

Operators
(S2)
(R2)
(R3)

Objectives: To evaluate the candidates' ability to raise power and control reactivity. To evaluate the candidates' ability to trip of the running CSIP, a loss of a pressurizer backup heater group, a failed VCT level channel, and a partial loss of condenser vacuum. To evaluate the candidates' response to a steamline break inside containment which will require a plant trip with the failure of the reactor to trip from the Control Room. Post-trip complications will include a failure of both trains of Containment Spray to actuate, requiring manual operation and alignment.

Initial Conditions: IC-5; 49% power BOL; Equipment OOS is HDP A.

Turnover: Power is 49% at BOL, 6 hours following a startup with a power ramp of 3 MW/min.

One train of condensate and condensate booster pumps is in service. HDPs are not operating.

HDP A is out of service for oil replacement due to contaminants and is expected to be returned to service within the next hour.

Boron concentration is 1510 ppm. Bank D rods are at 149 steps.

Shift orders are to continue raising power at the current rate and restore HDP A to service when it becomes available. GOP-005, Step 139, is in effect.

Event Number	Malfunction Number (1)	Event Type*	Event Description
1	NA	BOP(N) SRO(N)	Up Power Ramp
		RO(R) SRO(R)	Control of reactivity during up power ramp
2	FT-477 @ 0	BOP(I) SRO(I)	Controlling channel of SG A feed flow fails low

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Event Number	Malfunction Number	Event Type*	Event Description
3	CVC-5A	RO(C) SRO(C)	Trip of CSIP A
4	LT-112 @ 100	RO(I) SRO(I)	VCT level channel LT-112 failed high
5	CND-3 @ 4.5	BOP(C) SRO(C)	Partial loss of condenser vacuum, 300 second ramp
6	MSS-1C @ 8E6	RO(M) BOP(M) SRO(M)	Main steamline break inside of Containment, ramped over 1200 secs, with failure of Reactor to Trip from Control Room
	RPS-1B 3 3	RO(M) BOP(M) SRO(M)	(ATWS)
7	SSPS Relay Failures TBD	RO(C) SRO(C)	Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Facility: **SHNPP** Scenario Number: **SPARE** Op-Test Number: 2000-301

Examiners

Operators

Objectives: To evaluate the candidates' ability to shift operating CW pumps, respond to a failure of the Letdown Pressure controller, a trip of the running CSIP, a SG steam flow channel failure, and a Heater Drain Pump Trip with a failure of the turbine to automatically runback. To evaluate the candidate's implementation of emergency operating procedures in response to a small break loss of coolant accident concurrent with a Loss of Offsite Power. Post-trip evaluation will determine the candidates' ability to respond to a failure of the remaining available CSIP to automatically start.

Initial Conditions: IC-20. 100% power EOL. CW Pump C is secured. HD Pump A is secured.

Turnover: 100% power, EOL.

Main Condenser Vacuum Pump B is out of service to allow maintenance to troubleshoot a high vibration condition. Heater Drain Pump 1A is out of service for oil replacement.

Boron concentration is 241 ppm. Bank D rods are at 218 steps.

Shift orders are to maintain power at 100%. Place CW Pump C in service and secure CW Pump A to allow maintenance to perform electrical checks on CW Pump A breaker. Restore Heater Drain Pump 1A to service when maintenance completes work.

Event Number	Malfunction Number (1)	Event Type*	Event Description
1	NA	BOP(N) SRO(N)	Shift Operating CW Pumps per OP-138.01
2	PT-145 @ 0	RO(I) SRO(I)	Low failure of Letdown Pressure Transmitter PT-145
3	CVC-5A	RO(C) SRO(C)	Trip of CSIP A

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Event Number	Malfunction Number	Event Type*	Event Description
4	PT-484 @ 100	BOP(I) SRO(I)	SG B steam flow channel failed high
5	CFW-12B	BOP(C) SRO(C)	Trip of HDP 1B
	PS-1006 @ 0	BOP(C) SRO(C)	PS-1006 failed in it's low pressure state resulting in a failure of the automatic turbine runback to occur
	NA	RO(R) SRO(R)	Reactivity control of reactor during/following the power reduction
6	RCS-18C @ 10%	RO(M) BOP(M) SRO(M)	SB LOCA inside containment concurrent with Loss of Offsite Power
	EPS-1	RO(M) BOP(M) SRO(M)	(Loss of Offsite Power)
7	SSPS Relay TBD	RO(C) SRO(C)	CSIP-B fails to autostart following SI concurrent with Loss of Offsite Power

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

(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

OPERATING TEST NO.: **SHNPP RO-1**

Applicant Type	Evolution Type	Minimum Number	Scenario Number					
			1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1	2	NA	NA		NA	NA
	Normal	1		NA	NA	1	NA	NA
	Instrument / Component	4	5-6	NA	NA	2-3-7	NA	NA
	Major	1	7	NA	NA	8-9-10	NA	NA
SRO-I **As RO**	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						
SRO-U	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

Instructions:

(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

Author: William Gross /

Chief Examiner:

OPERATING TEST NO.: **SHNPP RO-2**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1	NA		NA	NA	1	NA
	Normal	1	NA	1-2	NA	NA		NA
	Instrument / Component	4	NA	3-4-8-9	NA	NA	3-4-7	NA
	Major	1	NA	7	NA	NA	6	NA

Applicant Type	Evolution Type	Minimum Number	1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
SRO-I **As RO**	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

Applicant Type	Evolution Type	Minimum Number	1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
SRO-U	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

Instructions:
(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SHNPP RO-3**

Applicant Type	Evolution Type	Minimum Number	Scenario Number					
			1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1	NA	NA	1-2	NA	NA	
	Normal	1	NA	NA		NA	NA	1
	Instrument / Component	4	NA	NA	4-5-6	NA	NA	2-5
	Major	1	NA	NA	8-9-10	NA	NA	6

Applicant Type	Evolution Type	Minimum Number	1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
As RO	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
SRO-I								
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

Applicant Type	Evolution Type	Minimum Number	1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
SRO-U	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

Instructions:

(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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Chief Examiner:

OPERATING TEST NO.: **SRO(U)-1**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1						
	Normal	1						
	Instrument / Component	4						
	Major	1						
As RO	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
SRO-I								
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						
SRO-U	Reactivity	0	2		NA		NA	
	Normal	1	1-2		NA		NA	
	Instrument / Component	2	3-4-5-6-8-9		NA		NA	
	Major	1	7		NA		NA	

Instructions:

(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SRO(U)-2**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1						
	Normal	1						
	Instrument / Component	4						
	Major	1						
As RO	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
SRO-I								
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						
SRO-U	Reactivity	0	NA		NA		1	
	Normal	1	NA		NA		1	
	Instrument / Component	2	NA		NA		2-3-4-5-7	
	Major	1	NA		NA		6	

Instructions:

(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SRO(U)-3**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1						
	Normal	1						
	Instrument / Component	4						
	Major	1						
As RO	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
SRO-I								
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						
SRO-U	Reactivity	0	NA		1-2		NA	
	Normal	1	NA		1		NA	
	Instrument / Component	2	NA		2-3-4-5-6-7		NA	
	Major	1	NA		8-9-10		NA	

Instructions:

(1) Enter the operating test number and Form ES-D-1 event numbers for each evolution type.

(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.

(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SHNPP RO-1**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1	2	NA	NA		NA	NA
	Normal	1		NA	NA	1	NA	NA
	Instrument / Component	4	4-5-10	NA	NA	2-3-7	NA	NA
	Major	1	7	NA	NA	8-9	NA	NA
SRO-I **As RO**	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						
SRO-U	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

Instructions:
(1) Enter the operating test number and Form ES-D-1event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SHNPP RO-2**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1	NA		NA	NA	1	NA
	Normal	1	NA	1-2	NA	NA		NA
	Instrument / Component	4	NA	3-6-8-9	NA	NA	3-4-7	NA
	Major	1	NA	7	NA	NA	6	NA
As RO	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
SRO-I								
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						
SRO-U	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

Instructions:
(1) Enter the operating test number and Form ES-D-1event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SHNPP RO-3**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1	NA	NA	1-2	NA	NA	
	Normal	1	NA	NA		NA	NA	1
	Instrument / Component	4	NA	NA	4-5-6	NA	NA	2-5
	Major	1	NA	NA	8-9	NA	NA	6

As RO	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
SRO-I								
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

SRO-U	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

Instructions:
(1) Enter the operating test number and Form ES-D-1event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SRO(U)-1**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1						
	Normal	1						
	Instrument / Component	4						
	Major	1						
As RO	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
SRO-I								
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						
SRO-U	Reactivity	0	2		NA		NA	
	Normal	1	1-2		NA		NA	
	Instrument / Component	2	3-4-5-6-8-9-10		NA		NA	
	Major	1	7		NA		NA	

Instructions:
(1) Enter the operating test number and Form ES-D-1event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SRO(U)-2**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1						
	Normal	1						
	Instrument / Component	4						
	Major	1						
SRO-I **As RO**	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						
SRO-U	Reactivity	0	NA		NA		1	
	Normal	1	NA		NA		1	
	Instrument / Component	2	NA		NA		2-3-4-5-7	
	Major	1	NA		NA		6	

Instructions:
(1) Enter the operating test number and Form ES-D-1event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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Chief Examiner: ______________________

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OPERATING TEST NO.: **SRO(U)-3**

Applicant Type	Evolution Type	Minimum Number	Scenario Number 1 RO	1 BOP	2 RO	2 BOP	3 RO	3 BOP
RO	Reactivity	1						
	Normal	1						
	Instrument / Component	4						
	Major	1						

As RO	Reactivity	1						
	Normal	0						
	Instrument / Component	2						
	Major	1						
SRO-I								
As SRO	Reactivity	0						
	Normal	1						
	Instrument / Component	2						
	Major	1						

SRO-U	Reactivity	0	NA		1-2		NA	
	Normal	1	NA		1		NA	
	Instrument / Component	2	NA		2-3-4-5-6-7		NA	
	Major	1	NA		8-9		NA	

Instructions:
(1) Enter the operating test number and Form ES-D-1event numbers for each evolution type.
(2) Reactivity manipulations may be conducted under normal or controlled abnormal conditions (refer to Section D.4.d) but must be significant per Section C.2.a of Appendix D.
(3) Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirement.

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OPERATING TEST NO.: **SHNPP**

Competencies	SRO-1	SRO-2	SRO-3	RO-1		RO-2		RO-3	
	SCEN.	SCEN.	SCEN.	SCENARIO		SCENARIO		SCENARIO	
	1 SRO	3 SRO	2 SRO	1 RO	2 BOP	1 BOP	3 RO	2 RO	3 BOP
Understand and Interpret Annunciators and Alarms	3-4-5-6-7-8-9-10	2-3-4-5-6-7	2-3-4-5-6-7-8	4-5-7-10	2-3-7-8	3-6-7-8-9	3-4-6-7	4-5-6-8	2-5-6
Diagnose Events and Conditions	3-4-5-6-7-8-9-10	2-3-4-5-6-7	2-3-4-5-6-7-8	4-5-7-10	2-3-7-8	3-6-7-8-9	3-4-6-7	4-5-6-8	2-5-6
Understand Plant and System Response	ALL	ALL	ALL	2-4-5-7-10	1-2-3-7-8	1-2-3-6-7-8-9	1-3-4-6-7	1-2-4-5-6-8	1-2-5-6
Comply With and Use Procedures (1)	ALL	ALL	ALL	2-4-5-7-10	1-2-3-7-8	1-2-3-6-7-8-9	1-3-4-6-7	1-2-4-5-6-8	1-2-5-6
Operate Control Boards (2)	NA	NA	NA	2-4-5-7-10	1-2-3-7-8	1-2-3-6-7-8-9	1-3-4-6-7	1-2-4-5-6-8	1-2-5-6
Communicate and Interact With the Crew	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL
Demonstrate Supervisory Ability (3)	ALL	ALL	ALL						
Comply With and Use Tech. Specs. (3)	3-5	3-4	2-3						

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

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Chief Examiner: ______________________________

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OPERATING TEST NO.: **SHNPP**

Competencies	SRO-1	SRO-2	SRO-3	RO-1		RO-2		RO-3	
	SCEN.	SCEN.	SCEN.	SCENARIO		SCENARIO		SCENARIO	
	1 SRO	3 SRO	2 SRO	1 RO	2 BOP	1 BOP	3 RO	2 RO	3 BOP
Understand and Interpret Annunciators and Alarms	3-4-5-6-7-8-9	2-3-4-5-6-7	2-3-4-5-6-7-8-9-10	5-6-7	2-3-7-8-9-10	3-4-7-8-9	3-4-6-7	4-5-6-8-9-10	2-5-6
Diagnose Events and Conditions	3-4-5-6-7-8-9	2-3-4-5-6-7	2-3-4-5-6-7-8-9-10	5-6-7	2-3-7-8-9-10	3-4-7-8-9	3-4-6-7	4-5-6-8-9-10	2-5-6
Understand Plant and System Response	ALL	ALL	ALL	2-5-6-7	1-2-3-7-8-9-10	1-2-3-4-7-8-9	1-3-4-6-7	1-2-4-5-6-8-9-10	1-2-5-6
Comply With and Use Procedures (1)	ALL	ALL	ALL	2-5-6-7	1-2-3-7-8-9-10	1-2-3-4-7-8-9	1-3-4-6-7	1-2-4-5-6-8-9-10	1-2-5-6
Operate Control Boards (2)	NA	NA	NA	2-5-6-7	1-2-3-7-8-9-10	1-2-3-4-7-8-9	1-3-4-6-7	1-2-4-5-6-8-9-10	1-2-5-6
Communicate and Interact With the Crew	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL	ALL
Demonstrate Supervisory Ability (3)	ALL	ALL	ALL						
Comply With and Use Tech. Specs. (3)	3-6	2-3-4	3-4						

Notes:

(1) Includes Technical Specification compliance for an RO.

(2) Optional for an SRO-U.

(3) Only applicable to SROs.

Author: William Gross / William Gross

Chief Examiner: [signature]

INITIAL SUBMITTAL

HARRIS EXAM 2000-301

DECEMBER 11 - 15, 2000

INITIAL SUBMITTAL JPMS

ADMINISTRATIVE JPMs/QUESTIONS
SIMULATOR JPMs,
IN-PLANT JPMs, AND
INITIAL ADMIN TOPICS OUTLINE
(ES-301-1),
CONTROL ROOM SYSTEMS &
FACILITY WALK-THROUGH OUTLINE
(ES-301-2)

Facility:	SHNPP	Date of Examination:	11-Dec-00
Examination Level:	RO	Operating Test Number:	2000-301

	Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions (KA #)
A.1	CONDUCT OF OPERATIONS	Obtain and Verify Controlled Copy of Procedure. (2.1.21)
		Perform a Manual Shutdown Margin Calculation (2.1.25 / 001A4.11)
A.2	EQUIPMENT CONTROL	Equipment Deficiency Identification, Reporting, and DLE Initiation (2.2.19)
A.3	RADIATION CONTROL	Determine Entry Requirements for a Contaminated Area (2.3.4)
A.4	EMERGENCY PLAN	Notify State and County Agencies (2.4.43)

Facility: **SHNPP** Date of Examination: **11-Dec-00**

Examination Level: **SRO-U** Operating Test Number: 2000-301

	Administrative Topic/Subject Description	Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions (KA #)
A.1	CONDUCT OF OPERATIONS	Determine Main Turbine Loading Information Using Operations Curve Book (2.1.25)
		Perform a Manual Shutdown Margin Calculation (2.1.25 / 001A4.11)
A.2	EQUIPMENT CONTROL	Review of Completed Operations Surveillance Test (2.2.12)
A.3	RADIATION CONTROL	Review / Approve a Waste Release Permit (2.3.6)
A.4	EMERGENCY PLAN	Perform an Emergency Action Level Classification (2.4.41)

Facility: **SHNPP**	Date of Examination: **11-Dec-00**
Examination Level: **RO**	Operating Test Number: 2000-301

B.1 Control Room Systems

System/JPM Title	Type Code*	Safety Function (KA #)
a. Start an EDG for Testing	DS	6 (064A4.01)
b. Place Containment Cooling in 118°F Mode	MAS	5 (022A4.01)
c. Transfer to Hot Leg Recirculation	MASL	2 (006A4.05)
d. Obtain a Grab Sample on the Plant Vent Stack	NS	7 (073A4.02)
e. Respond to Decreasing CCW Surge Tank Level	DS	8 (026AA1.05)
f. Perform RHR Pump Operability Test	NSL	4P (005A4.01)
g. Perform Control Rod Exercise Test	NAS	1 (001A2.03)

B.2 Facility Walk-Through

System/JPM Title	Type Code*	Safety Function (KA #)
a. Locally Reset the Turbine Driven Auxiliary Feed Pump	DRSL	4S (WE05EA1.1)
b. Inhibit Both Trains of SSPS	DL	7 (012A4.05)
c. Emergency Makeup to the Spent Fuel Pool	MAR	8 (033A2.03)

*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: **SHNPP** Date of Examination: **11-Dec-00**

Examination Level: **SRO-U** Operating Test Number: 2000-301

B.1 Control Room Systems		
System/JPM Title	Type Code*	Safety Function (KA #)
a. Manually Align SI Following a LOSP	DASL	2 (006A4.02)
b. Obtain a Grab Sample on the Plant Vent Stack	NS	7 (073A4.02)
c. Perform RHR Pump Operability Test	NSL	4P (005A4.01)
d.		
e.		
f.		
g.		

B.2 Facility Walk-Through		
a. Locally Reset the Turbine Driven Auxiliary Feed Pump	DRSL	4S (WE05EA1.1)
b. Emergency Makeup to the Spent Fuel Pool	MAR	8 (033A2.03)
c.		

*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: **SHNPP** Scenario Number: **1** Op-Test Number: 2000-301

Examiners

Operators
(S-1)
(R-1)
(R-2)

Objectives: To evaluate the candidate's ability to shutdown the HDPs. To evaluate the candidates' ability to respond to a SG level channel failure, a pressurizer pressure high failure with a subsequent failure of a pressurizer PORV to reseat, and a failure of the main generator auto voltage regulator. During the required power reduction, the candidates will be evaluated on their ability to control reactivity. The candidates will be evaluated on their ability to diagnose and respond to a SGTR. Following the plant trip, the candidates will be required to respond to a failure of the turbine to trip when required. Post-trip complications will also include a failed open safety valve on the ruptured SG and a failure of a pressurizer spray valve to close following the required RCS depressurization.

Initial Conditions: IC-6, 38% power BOL; Equipment OOS is RHR Pump 1B-SB.

Turnover: Power is 38% at BOL. Core burnup is 52 EFPD.

RHR Pump 1B-SB has been out of service for 64 hours and is not expected to be available within the next 8 hours. Technical Specification action 3.5.2.a has been entered and a shutdown at 5 MW/min is being performed to meet Technical Specifications.

Boron concentration is 1230 ppm. Bank D rods are at 152 steps.

Shift orders are to continue the power power reduction and be prepared to perfom at reactor shutdown within the next 4 hours. GP-006 has been completed through Step 14.

Event Number	Malfunction Number (1)	Event Type*	Event Description
1	NA	BOP(N) SRO(N)	Stop both HDPs per OP-136
2	NA	BOP(N) SRO(N)	Continued plant power reduction
		RO(R) SRO(R)	Reactivity control during power reduction

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Event Number	Malfunction Number	Event Type*	Event Description
3	LT-486 @ 0	BOP(I) SRO(I)	SG B controlling level channel failed low
4	PT-444 @ 2500	RO(I) SRO(I)	Pressurizer Pressure Channel P-444 high failure
5	PRS-3F @ 1%	RO(C) SRO(C)	Pressurizer PORV PCV-444B fails to reseat following high failure of Pressurizer pressure
6	GEN-1 @ 130%	BOP(C) SRO(C)	Failure of Main Generator automatic voltage regulator, ramped over 300 secs
7	SGN-5A @ 750	RO(M) BOP(M) SRO(M)	Steam Generator Tube Rupture on SG A, ramped over 720 secs
8	TUR-2	BOP(C) SRO(C)	Main Turbine fails to trip on Reactor Trip
9	SGN-4A @ 5%	BOP(C) SRO(C)	Steam Generator Safety fails 5% open following isolation of ruptured SG
10	PRS-2A AS IS	RO(C) SRO(C)	Pressurizer Spray Valve fails to close following RCS depressurization

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM COM-A.1-2

Perform a Manual Shutdown Margin Calculation

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Perform a Manual Shutdown Margin Calculation

Alternate Path: NONE

Facility JPM #: CR-016 (Significantly Modified)

K/A Rating: 001A4.11 Importance: SRO 4.1 RO 3.5

K/A Statement: Ability to manually operate and / or monitor in the control room: Determination of SDM

Task Standard: OST-1036, Attachment 3, Manual SDM Calculation (Modes 1 and 2) completed satisfactorily.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: OST-1036, Shutdown Margin Calculation Modes 1-5
Curve Book

Validation Time: 15 minutes Time Critical: NO

Candidate: ____________________

Time Start: ________ Time Finish: ________

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ____________________

____

Examiner: ____________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OST-1036, Attachment 3.
Curve Book.

NOTE: Completed copy of Attachment 3 included at end of JPM to be used as key.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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 plant has been operating at 75% power for 6 weeks.
Core burnup is 350 EFPD.
RCS boron concentration is 300 ppm.
NO rods are believed to be immovable / untrippable.

INITIATING CUES:

You are to complete OST-1036, Shutdown Margin Calculation Modes 1-5, Attachment 3, "Manual SDM Calculation (Modes 1 and 2)" for current plant conditions.

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates OST-1036, Attachment 3, and Curve Book NOTES: ***NOTE: Completed copy of Attachment 3 included at end of JPM to be used as key.*** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Enters Reactor Power Level STANDARD: Refers to given conditions and enters 75% NOTES: ***NOTE: Given as part of initial conditions.*** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Determine Rod Insertion Limit for power level	**CRITICAL STEP**
STANDARD:	Refers to Curve F-10-1 and determines TS limit for RIL to be 140 ± 2 steps	
NOTES:	***CRITICAL TO ALLOW DETERMINING INTEGRAL ROD WORTH.***	____ SAT
COMMENTS:		____ UNSAT

STEP 4:	Enters core Burn Up	
STANDARD:	Refers to given conditions and enters 350 EFPD.	
NOTES:	***NOTE: Given as part of initial conditions.***	____ SAT
COMMENTS:		____ UNSAT

STEP 5: Enters RCS Boron Concentration STANDARD: Refers to initial conditions and enters 300 ppm NOTES: ***NOTE: Given as part of initial conditions.*** COMMENTS:	____ SAT ____ UNSAT
STEP 6: Determines Power Defect for current power level STANDARD: Refers to Curve C-10-3 and determines power defect to be 1980± 50 pcm NOTES: ***NOTE: Curve C-10-3 used due to core burn up.*** ***CRITICAL TO ENSURE PROPER POWER DEFECT INCLUDED IN CALCULATION.*** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 7: Determines Rod Worth for RIL position determined in Step 3 above STANDARD: Refers to Curve A-10-11 and determines rod worth to be 635 ± 25 pcm NOTES: ***NOTE: Curve A-10-11 used due to core burn up, equilibrium xenon conditions, and power > 10%.*** ***CRITICAL TO ENSURE PROPER ROD WORTH INCLUDED IN CALCULATION.*** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 8: Enters worth of any additional immovable or untrippable rods STANDARD: Refers to given conditions and enters 0 NOTES: ***NOTE: Given as part of initial conditions.*** COMMENTS:	____ SAT ____ UNSAT

STEP 9:	Determines Total Shutdown Margin	**CRITICAL STEP**
STANDARD:	Determines Total Shutdown Margin to be 4379$\pm$ 75 pcm	
NOTES:	***NOTE: Tolerance determined using previously allowed tolerances in reading graphs.*** **CRITICAL TO CORRECTLY DETERMINE TOTAL SHUTDOWN MARGIN.**	____ SAT ____ UNSAT
COMMENTS:		
	END OF TASK	

STOP TIME: ________

ANSWER KEY FOR JPM COM-A.1-2

Attachment 3
Sheet 1 of 1

(SHADED AREA BELOW INDICATES DATA ALREADY PROVIDED)

Manual SDM Calculation (Modes 1 and 2)

1. Reactor power level. **75** %

2. Rod insertion limit for the above power level

   140 ± 2 steps on bank **D**

3. Burn up (POWERTRAX/MCR Status Board). **350** EFPD

4. Present RCS Boron Concentration **300** ppm

NOTE: Use absolute values of numbers obtained from curves.

5. Total worth of all control and shutdown banks, minus the worth of the most reactive rod for Fuel Cycle 10.

   6994 pcm
   (a)

6. Cycle 10 Power defect for the power level recorded in Step 1. (Refer to Curves C-X-1 to C-X-3).

   Curve used **C-10-3** **1980 ± 50** pcm
   (b)

NOTE: HFP curves are used for power levels of 10% or greater.

7. Inserted control rod worth at the rod insertion limit recorded in Step 2. (Refer to Curves A-X-6 to A-X-11)

   Curve used **A-10-11** **635 ± 25** pcm
   (c)

8. Worth of any additional immovable or untrippable rods (for each stuck rod, use the most reactive single rod worth (3028 pcm) or obtain individual withdrawn rod worth from the reactor engineer).

   0 pcm
   (d)

9. Determine the Total Shutdown Margin using the following formula:

$$\underset{(e)}{\text{Total SDM } C_B} = \underset{(a)}{\mathbf{6994}} - \underset{(b)}{\mathbf{1980 \pm 50}} - \underset{(c)}{\mathbf{635 \pm 25}} - \underset{(d)}{\mathbf{0}}$$

   4379 ± 75 pcm
   (e)

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant has been operating at 75% power for 6 weeks.
Core burnup is 350 EFPD.
RCS boron concentration is 300 ppm.
NO rods are believed to be immovable / untrippable.

INITIATING CUES:

You are to complete OST-1036, Shutdown Margin Calculation Modes 1-5, Attachment 3, "Manual SDM Calculation (Modes 1 and 2)" for current plant conditions.

C
CONTINUOUS
USE

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 9

PROCEDURE TYPE: Operations Surveillance Test

NUMBER: OST-1036

TITLE: Shutdown Margin Calculation Modes 1 - 5

NOTE: This procedure has been screened per PLP-100 criteria and determined to be a CASE III procedure. No additional management involvement is required.

1.0 PURPOSE

NOTE: If the requirement to perform a SDM Calculation is time critical, the Manual Calculation has been evaluated to be the preferred method.

1. Provide methods to ensure that RCS boron concentration has a shutdown margin greater than 1770 pcm in Modes 1 and 2, through the use of calculations.

2. Provide methods to ensure that RCS has an adequate shutdown margin by verifying the RCS boron concentration is greater than the minimum required boron concentration in Modes 3 through 5.

3. This procedure satisfies the requirements of Technical Specification Surveillance Requirements 4.1.1.1.1.a, 4.1.1.2.a and 4.1.1.2.b.

2.0 REFERENCES

2.1 Plant Operating Manual Procedures

1. AP-039
2. AOP-002
3. PLP-106

2.2 Technical Specifications

1. 3.1.1.1
2. 3.1.1.2
3. 4.1.1.1.1.a
4. 4.1.1.2.a
5. 4.1.1.2.b

2.3 Final Safety Analysis Report

1. 15.4.6.2

2.4 Other

1. Plant Curve Book
2. Shearon Harris Unit 1, Cycle 10 Startup and Operations Report, Harris Engineering Calculation HNP-F/NFSA-00054.
3. EMF-1715(P) Powertrax Users Guide
4. ESR 98-00388
5. ESR 99-00028

3.0 PREREQUISITES

1. The performance of this OST has been coordinated with other plant evolutions such that the minimum equipment operating requirements of Tech Specs are met. ________

2. Obtain any tools and equipment required per Section 5.0. ________

3. The Unit SCO has granted permission to perform this OST and all prerequisites are met.

________________________ ________
Signature Date

4.0 PRECAUTIONS AND LIMITATIONS

1. If either of the following conditions exist, initiate emergency boration per AOP-002 and continue until the required shutdown margin is achieved:

 - In Modes 1 and 2, shutdown margin is less than 1770 pcm,

 OR

 - In Modes 3 - 5 shutdown margin is less than required by PLP-106, Technical Specification Equipment List Program and Core Operating Program.

2. Projected conditions should be for the minimum shutdown margin expected in the next 24 hours unless a manual Xenon free calculation is performed.

3. If POWERTRAX is being used it should have been updated with recent power history (less than 72 hours during steady state operation).

4. The POWERTRAX program cannot be run out long enough to calculate a totally Xenon-free value for SDM for any given time. To obtain Xenon Free data, either use the SOR Minimum Boron which is shown on any SDM printout, or perform a manual SDM calculation per Section 7.2.

5. Rod worth provided in this procedure for control banks, shutdown banks, and most reactive rod are the most conservative values for Cycle 10 only. Subsequent fuel cycles will require a change to this procedure.

6. If the mouse does not work as expected, then go to the Mouse program in Windows and change the mouse button setup to "unassigned".

7. The required minimum boron concentration usually varies with xenon decay. It is necessary to select a time and temperature based calculation that corresponds to planned plant evolution, and repeat this calculation as necessary if the plan changes.

4.0 PRECAUTIONS AND LIMITATIONS (continued)

8. Powertrax is an ICON based computer program. After a calculation is completed, positioning the mouse on a specific node located on the graph and clicking the center mouse button will display the parameters for that specific node. If the mouse is a two button unit the equivalent function is obtained by depressing both buttons at the same time. This function can be used as many times as desired and allow a printout of the specific time/data points needed.

9. The Powertrax Shutdown Boron Concentration Module printout will show the Xenon free boron as SOR Minimum Boron. The minimum shutdown boron for the projected time will be listed in the table specific to the temperature under the "ppm B" column.

5.0 TOOLS AND EQUIPMENT

1. EMF-1715(P) Powertrax Users Guide

2. Operations Curve Book

3. Technical Specifications

4. PLP-106 Shutdown Margin Curve

6.0 ACCEPTANCE CRITERIA

This procedure will be completed satisfactorily if any one of the following three criteria is met:

1. In Modes 3 - 5, Section 7.1 is completed satisfactorily as indicated by the current RCS boron being greater than the minimum RCS boron listed on the POWERTRAX printout for the desired condition, OR

2. In Modes 1 or 2, Section 7.3 is completed satisfactorily as indicated by the shutdown margin recorded in Item 9 of Attachment 3 being greater than or equal to 1770 pcm, OR

3. In Modes 3, 4 or 5, Section 7.2 is completed satisfactorily as indicated by the current RCS boron being greater than the calculated required shutdown boron concentration.

7.0 PROCEDURE

NOTE: Due to conflicts between the operating systems(Unix vs. Windows), the Microsoft Desktop toolbar should be disabled during Powertrax operations.

CAUTION

Do not use Section 7.1 before initial criticality on any new fuel cycle.

---

1. If this procedure is being performed to verify Shutdown Boron Concentration in Modes 3, 4, or 5 with **two or more stuck rods**, then: (N/A this Step if one or no stuck rods or if not in Modes 3, 4, or 5)

   a. The required Shutdown Boron Concentration is equal to 2085 ppm with no further calculation required. ________

   b. Complete Attachment 4, Certifications and Reviews, and inform the Unit SCO that this test has been completed. ________

7.1 Shutdown Boron Concentration Prediction Using POWERTRAX (Modes 3 - 5)

NOTE:
- Fuel burn up(EFPD) can be determined using Section 7.4.
- The review of the Control Operator's Log will ensure adequate sampling of a constant xenon condition to provide an accurate Shutdown Margin.

1. Review the Control Operator's Log to ensure steady state conditions (less than 10% power manipulations) within the previous 72 hours. ________

2. If steady state conditions have not existed for the past 72 hours, perform one of the following:(N/A if not performed)

   a. Contact Reactor Engineering and have additional MICROBURN-P triggers processed, if required. ________

   b. Discontinue this procedure section and perform Section 7.2. ________

3. Record the following parameters:

   a. RCS Sample Time: ________ Time ________ Date

   b. RCS Boron Concentration: ________ ppm

   c. Projected SDM Time and Date ________ Time ________ Date

   d. Projected SDM Temperature ________ °F

   ____

7.1 Shutdown Boron Concentration Prediction Using POWERTRAX (Modes 3 - 5) (continued)

NOTE: Powertrax is a case sensitive application. The commands listed in "apostrophes" should be typed as listed in the procedure.

4. To use the STA LAN computer perform the following steps:

   a. Go to START/STA Icons ________

   b. Double click on **PowerTrax at HNP** icon. ________

   c. Sign on User ID as "sta". ________

   d. TAB to Password ________

   e. Use "hnp_sta" as a password ________

   f. Depress ENTER. ________

NOTE: Due to conflicts between the operating systems(Unix vs. Windows), step 7.1.0.04.g may have to be performed twice.

   g. When the HNP Unix window opens, performs the following:

      (1) Enter "hnpptx" ________

      (2) Depress ENTER. ________

5. From the PowerTrax Main Menu select:

Shutdown Boron Concentration Prediction

____

6. Once the Powertrax Shutdown Boron Concentration Module screen appears, perform the following:

   a. Activate the "File" pull down menu ________

   b. Select "Open" ________

   c. Select "MB-P File" ________

NOTE: "Directories" will be listed in the following format: "/ptrax/hnp/CY10/MBP/d.YYMMDD.HHmmss". Example would be /ptrax/hnp/CY10/MBP/d.001201.090037 = 12/01/00 @ 0900.37

7.1 Shutdown Boron Concentration Prediction Using POWERTRAX (Modes 3 - 5) (continued)

7. While viewing the File Selection Menu screen, perform the following:

   a. In the Directories sub-screen, select the most recent directory. ________

   b. Verify the Time and Date of the file to be used is within 72 hours of the desired shutdown margin calculation projected Time and Date. ________

   c. Select "Filter" ________

   d. In the Files sub-screen, select the file labeled as "dat.YYMMDD.HHmmss". ________

   e. Select "OK" ________

8. On the Powertrax Shutdown Boron Concentration Module Screen, input the following POWERTRAX data fields:

   a. Calc Directory (suggest YYMMDD_XXX, where XXX is the users initials) ________

   b. Determine the hours between the last MB-P File(Step 7.1.0.07.d) and the projected SDM(24 hours into the future). ________

   c. Divide the hours(Step 7.1.0.08.b) by 2 and round up to the next whole number. ________

   d. Enter the resultant from Step 7.1.0.08.c into the Number of Calculations(Default is 12). ________

   e. Verify Delta Time (hrs) entered (Default is 2). ________

9. Activate the "File" pull down menu and perform the following:

   a. Select "Run" ________

   b. At the "Job Execution Dialog" box, select "Run". ________

7.1 Shutdown Boron Concentration Prediction Using POWERTRAX (Modes 3- 5) (continued)

NOTE: POWERTRAX will take about 6 minutes to complete the necessary calculations at 30 seconds per point.

10. After the calculation is complete, perform the following:

    a. Activate the "Output" pull down menu. _________

    b. Select "Output". _________

11. If any rod is known to be immovable or untrippable and is not completely inserted in the core, perform the following: (otherwise, mark the Step "N/A" and proceed to the next Step)

    a. For each stuck rod, use the value of the most reactive single rod worth (-1549 pcm) or obtain the individual withdrawn rod worth for each rod from Reactor Engineering. In the upper right hand portion of the screen, input the reactivity value of the known stuck rod(s). _________

12. Activate the "RCS Temperatures" pull down menu, and perform the following:

    a. Select "Select Temperatures" _________

    b. Input the desired corresponding temperature values. _________

    c. Select "OK". _________

13. Activate the "File" pull down menu, and perform the following:

    a. Select "Print" _________

    b. Select "Report" _________

    c. Select "Format" _________

    d. Select "OK" _________

14. Perform an Independent Verification from printout of the data entered in steps 7.1.0.07 through 7.1.0.012. _________

15. Verify the present RCS Boron is greater than the minimum boron concentration required for the projected conditions, by comparing PowerTrax output to data listed in Step 7.1.0.03.b. _________

16. Update the MCR Status Board with the current EFPD value. _________

7.1 <u>Shutdown Boron Concentration Prediction Using POWERTRAX (Modes 3- 5)</u> (continued)

17. To exit the PowerTrax application, perform the following:

    a. Activate the "File" pull down menu. ________

    b. Select "Close". ________

    c. Activate the "File" pull down menu. ________

    d. Select "Exit". ________

    e. Activate "Exit" pull down menu. ________

    f. Select "Exit". ________

    g. Depress Enter at the prompt. ________

    h. Type "exit". ________

    i. Depress Enter. ________

7.2 Manual SDM Calculation (Modes 3 - 5)

NOTE: Fuel burn up (EFPD) can be determined using Section 7.4.

1. Record the following information:

- EFPD ______ Core burn up from POWERTRAX/PDD/MCR Status board.
- SDM Temp ______ Temperature for which this SDM calculation is taking credit.
- C_{RCS} ______ Latest available RCS boron sample.
- A_{RCS} ______ RCS B-10 ATOM percent from MCR status board.

____

2. Check rod status as follows:

   a. If all rods are inserted, record C_{RODS} = 0 in Step 7.2.0.03.a and N/A Step 7.2.0.02.b. ________

   b. If all rods are not inserted, complete Attachment 1. ________

NOTE: Curve A-X-22 contains Notes to ensure SDM requirements are met for plant conditions.

3. Determine Xenon free SDM boron concentration, C_{SDM}, as follows:

   a. Record the following information:

   - C_{RODS} ______ Boron addition to compensate for stuck rods from Attachment 1 or Step 7.2.0.02.a.
   - C_{CURVE} ______ Uncorrected required SDM boron concentration from curve A-X-22 (Use action level line on curve.)

   ____

   b. Determine required Xenon free SDM uncorrected boron concentration C_{REQ}:

   $$C_{REQ} = C_{RODS} + C_{CURVE}$$

   C_{REQ} = ______

____

c. Determine Xenon free SDM corrected boron concentration, C_{SDM}:

$$C_{SDM} = \frac{19.9}{A_{RCS}} * (C_{REQ})$$

A_{RCS} - RCS B-10 ATOM percent from Step 7.2.0.01.

C_{SDM} = ______

C_{REQ} - Xe free SDM uncorrected boron concentration from Step 7.2.0.03.b.

______

4. Determine whether SDM requirements can be met by Xenon free SDM calculation:

a. Compare RCS boron concentration, C_{RCS}, and Xenon free SDM corrected boron concentration, C_{SDM}:

C_{RCS}	______	RCS boron sample from Step 7.2.0.01.
C_{SDM}	______	Xenon free SDM corrected boron concentration from Step 7.2.0.03.c.

______

b. If C_{RCS} is greater than C_{SDM}, then SDM requirements are met and this OST is satisfactory for the temperature recorded in Step 7.2.0.01 upon performance of the following: (otherwise N/A this Step)

(1) Perform an independent verification of this Section and applicable attachments.

______

(2) Mark remaining Steps in this Section N/A and complete Section 7.5 Test Completion.

______

c. If C_{RCS} is less than or equal to C_{SDM}, then continue with Step 7.2.0.05 to take credit for Xenon effects.

______

5. Perform Attachment 2 to calculate SDM boron requirements to account for Xenon effects.

______

6. Determine SDM boron concentration corrected for boron-10 and Xenon effects, $C_{SDM,XE}$:

- C_{XE} = ______ Boron equivalent to compensate for Xenon from Attachment 2.
- $C_{SDM,XE} = C_{SDM} - C_{XE}$ C_{SDM} - Xenon free SDM corrected boron concentration from Step 7.2.0.03.c.

$C_{SDM,XE}$ = ______

______

7.2 Manual SDM Calculation (Modes 3 - 5) (continued)

7. Determine whether SDM requirements can be met by SDM boron concentration corrected for boron-10 and Xenon effects:

   a. Compare RCS boron concentration, C_{RCS} , and SDM boron concentration corrected for boron-10 and Xenon effects, $C_{SDM, XE}$:

C_{RCS}	_______	Latest available RCS boron sample from Step 7.2.0.01.
$C_{SDM, XE}$	_______	SDM boron concentration corrected for boron-10 and Xenon effects from Step 7.2.0.06.

____

   b. If C_{RCS} is greater than $C_{SDM, XE}$, then SDM requirements are met and this OST is satisfactory for the temperature recorded in Step 7.2.0.01 until the projected time recorded in Attachment 2 upon performance of the following:

      (1) Perform an independent verification of this Section and applicable attachments. _______

      (2) Complete Section 7.5, Test Completion. _______

   c. If C_{RCS} is less than or equal to $C_{SDM, XE}$, then SDM requirements are not met and this OST is unsatisfactory. Borate to establish adequate SDM. _______

7.3 Manual SDM Calculation (Modes 1 and 2)

NOTE: Fuel burn up(EFPD) can be determined using Section 7.4.

1. Enter the absolute value for each parameter on Attachment 3. ______

2. Perform the calculation listed on Attachment 3 Item 9 for the required SDM boron concentration for the projected conditions. ______

3. Perform an independent verification of Attachment 3. ______

4. Verify that total SDM recorded on Attachment 3 is 1770 pcm or greater. ______

7.4 EFPD Determination

NOTE: Powertrax is a case sensitive application. The commands listed in "apostrophes" should be typed as listed in the procedure.

1. To use the STA LAN computer perform the following steps:

   a. Go to START/STA Icons ______

   b. Double click on HNP PowerTrax icon. ______

   c. Sign on User ID as "sta". ______

   d. TAB to Password ______

   e. Use "hnp_sta" as a password ______

   f. Depress ENTER. ______

7.4 EFPD Determination (continued)

NOTE: Due to conflicts between the operating systems (Unix vs. Windows), Step 7.4.0.01.g may have to be performed twice.

g. When the HNP Unix window opens, perform the following:

(1) Enter "hnpptx" ________

(2) Depress ENTER. ________

2. From the PowerTrax Main Menu select:

Reactivity Monitoring

____

3. Once the PowerTrax Reactivity Monitoring Module screen appears, select:

Apply Options

____

4. Record the burn up value corresponding to the last boron sample processed by PowerTrax in the third column, under column heading titled "Exposure(EFPD)"

________ EFPD ________

5. Update the MCR Status Board with the current EFPD value. ________

6. To exit the PowerTrax application, perform the following:

a. Activate the "File" pull down menu. ________

b. Select "Exit". ________

c. Activate "Exit" pull down menu. ________

d. Select "Exit". ________

e. Depress Enter at the prompt. ________

f. Type "exit". ________

g. Depress Enter. ________

7.5 Test Completion

1. If performed as a result of the detection of an inoperable control rod, document completion of task OS ER 001. (otherwise mark this step N/A)

   ____

2. If performed for the daily Modes 3, 4, and 5 requirement, document completion of task OS D 003. (otherwise mark this step N/A)

   ____

3. If sections 7.1 or 7.2 were performed and the results were satisfactory, record the following: (otherwise mark this step N/A)

   SDM Temperature ______

   Projected time after shutdown ______ Hours (N/A for Xenon Free calculations)

   ____

NOTE: If being performed for the weekly inline task, the task will require:

- The status board being updated
- A copy of this completed test being placed in the Curve Book at the ACP.

4. Complete applicable portions of Attachment 4, Certifications and Reviews, and inform the Unit SCO that this OST is completed.

   ____

8.0 DIAGRAMS/ATTACHMENTS

Attachment 1:	Boron Addition Calculation to Compensate for Stuck Rods
Attachment 2:	Boron Equivalent Calculation to Compensate for Xenon
Attachment 3:	Manual SDM Calculation (Modes 1 and 2)
Attachment 4:	Certifications and Reviews

Boron Addition Calculation to Compensate for Stuck Rods

1. Determine and record the number of rods not fully inserted into the core, N:

   N = ______ Number of rods not fully inserted into the core

NOTE: The reactivity worth of the single most reactive rod is 1549 pcm. Either this value or the individual withdrawn rod worth for each rod, as provided by the reactor engineer, may be used.

2. Determine reactivity worth of rods not fully inserted into the core:

   ρ_{RODS} = N * (1549 pcm)

   or

   ρ_{RODS} = Value provided by reactor engineering

   ρ_{RODS} = ______ Reactivity worth of rods not fully inserted into the core

3. Determine the absolute value of uncorrected differential boron worth, DBW_{UNC}, from curves A-X-16, A-X-17, or A-X-18.

   Curve used ______

   DBW_{UNC} = ______ DBW_{UNC} - Uncorrected differential boron worth

4. Determine boron addition to compensate for stuck rods, C_{RODS}:

   $$C_{RODS} = \frac{\rho_{RODS}}{DBW_{UNC}}$$

   ρ_{RODS} - Reactivity worth of rods not fully inserted into the core from Attachment 1, Step 2

   DBW_{UNC} - Uncorrected differential boron worth from Attachment 1, Step 3

   C_{RODS} = ______ Boron addition to compensate for stuck rods

5. Record value of C_{RODS} in Step 7.2.0.03.a.

Boron Equivalent Calculation to Compensate for Xenon

Note: The projected time from the shutdown margin calculation that compensates for Xenon effects should be for a minimum of 24 hours from the time this calculation is completed.

1. Determine projected time after shutdown:

   Projected Time = Time since shutdown__________Hours + 24 hours

   Projected Time =________ Hours

2. Determine the absolute value of Xenon reactivity worth at projected time from curves B-X-5, B-X-6 or B-X-7), ρ_{XE} :

   Curve used ______

   ρ_{XE} = ___ Xenon reactivity worth at projected time

3. Determine the absolute value of uncorrected differential boron worth, DBW_{UNC}, from curves A-X-16, A-X-17, or A-X-18.

   Curve used ______

   DBW_{UNC} = ______ DBW_{UNC} - Uncorrected differential boron worth

4. Determine corrected differential boron worth DBW_{corr}:

   $$DBW_{corr} = \frac{(DBW_{UNC})(A_{RCS})}{19.9}$$

   DBW_{UNC} - Uncorrected differential boron worth from Attachment 2, Step 3

   A_{RCS} - RCS B-10 ATOM percent from Step 7.2.0.01

   DBW_{corr} = _____ Corrected differential boron worth

5. Determine boron equivalent corrected for boron-10 and Xenon effects, C_{XE}:

   $$C_{XE} = \frac{\rho_{XE}}{DBW_{corr}}$$

   ρ_{XE} - Xenon reactivity worth at projected time from Attachment 2, Step 2

   DBW_{corr} - Corrected differential boron worth from Attachment 2, Step 4

   C_{XE} = ______ Boron equivalent to compensate for Xenon

6. Record value of C_{XE} in Step 7.2.0.06.

Manual SDM Calculation (Modes 1 and 2)

1. Reactor power level. ________ %

2. Rod insertion limit for the above power level

________ steps on bank ________

3. Burn up (POWERTRAX/MCR Status Board). ________ EFPD

4. Present RCS Boron Concentration ________ ppm

NOTE: Use absolute values of numbers obtained from curves.

5. Total worth of all control and shutdown banks, minus the worth of the most reactive rod for Fuel Cycle 10.

6994 pcm
(a)

6. Cycle 10 Power defect for the power level recorded in Step 1. (Refer to Curves C-X-1 to C-X-3).

Curve used ____________ ________ pcm
(b)

NOTE: HFP curves are used for power levels of 10% or greater.

7. Inserted control rod worth at the rod insertion limit recorded in Step 2.(Refer to Curves A-X-6 to A-X-11)

Curve used ____________ ________ pcm
(c)

8. Worth of any additional immovable or untrippable rods (for each stuck rod, use the most reactive single rod worth (3028 pcm) or obtain individual withdrawn rod worth from the reactor engineer).

________ pcm
(d)

9. Determine the Total Shutdown Margin using the following formula:

Total SDM C_B = ________ - ________ - ________ - ________
(e) (a) (b) (c) (d)

________ pcm
(e)

Certifications and Reviews

This OST was performed as a:

Periodic Surveillance Requirement: ________
Postmaintenance Operability Test: ________
Redundant Subsystem Test: ________

Plant Conditions: ______________________________ Mode: ________

OST Completed By: ______________________________ Date: ________
Time: ________

OST Performed By:

Initials	Name (Print)	Initials	Name (Print)

General Comments/Recommendations/Corrective Actions/Exceptions:

____
____
____

Pages Used: ______________________________
____

OST Completed with NO EXCEPTIONS/EXCEPTIONS:

______________________________ Date: ________
Unit SCO

After receiving the final review signature, this OST becomes a QA RECORD and should be submitted to Document Services.

Revision 17 Summary

General

This revision addresses AR 17174 to provide instructions in the procedure for Required Shutdown Boron Concentration for Modes 3, 4, and 5 with two or more stuck rods.

Description of Changes

Page	Section	Change Description
All		Updated to Rev. 17
5	7.0.1	Added step that in Modes 3-5 with two or more stuck rods, the Required Boron concentration is equal to the Refueling Boron concentration (2085 ppm) and that no further calculation is required.

Revision 18 Summary

General

This is an Administrative Correction to correct targeting errors which referenced incorrect step numbers.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM COM-A.3

Determine Entry Requirements for a Contaminated Area

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Determine Entry Requirements for a Contaminated Area

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 2.3.4 Importance: SRO 3.1 RO 2.5

K/A Statement: Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.

Task Standard: Determination made of appropriate requirements for entry to remove clearance on 1CS-95.

Preferred Evaluation Location: Simulator ______ In Plant X

Preferred Evaluation Method: Perform ______ Simulate X

References: NGGM-PM-0002, Radiation Control and Protection Manual
AP-535, Performing Work in Radiation Control Areas

Validation Time: 15 minutes Time Critical: NO

Candidate: ______________________________

Time Start: __________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________________

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

NOTE: This task should be performed after the candidate has completed in-plant JPMs which are located in the RCA and the candidate is still in the RCA.

Attached General RWP H00-0003.
Attached Survey Map # 082900-1.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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:

1CS-95, MOD HX BYPASS INLET ISOL VLV, has a clearance hung on it that must be removed.

INITIATING CUES:

You have just been directed to remove the clearance tag from 1CS-95, located in the RAB 236 Letdown Heat Exchanger valve gallery.

Once the tag is removed, you are to OPEN the valve.

START TIME: ________

STEP 1: Locates area and determines area is contaminated STANDARD: Locates Letdown Heat Exchanger valve gallery room on RAB 236 and determines area is contaminated NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 2: Proceed to HP to obtain survey map, dress requirements, and discuss entry with HP STANDARD: Proceeds to HP to obtain survey map, dress requirements, and discuss entry with HP NOTES: ***CUE: Provide candidate with attached survey map and RWP after determining candidate is obtaining them.*** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Review survey map to determine contamination level at valve	**CRITICAL STEP**
STANDARD:	Reviews survey map and determines contamination level at 1CS-95 is 250,000 DPM/100 cm^2	
NOTES:	***CRITICAL TO DETERMINE LEVEL TO DETERMINE FURTHER REQUIREMENTS.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Review General RWP to determine entry requirements into contaminated area	**CRITICAL STEP**
STANDARD:	Reviews RWP H00-0003 and determines entry requirements for contaminated areas > 100,000 DPM/cm^2 are FULL PROTECTIVE CLOTHING, and Radiation Control Coverage must be INTERMITTENT	
NOTES:	***CRITICAL TO ENSURE ALL RADIOLOGICAL REQUIREMENTS MET.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

INSERT SURVEY MAP # 082900-1 and GENERAL RWP H00-0003 HERE.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

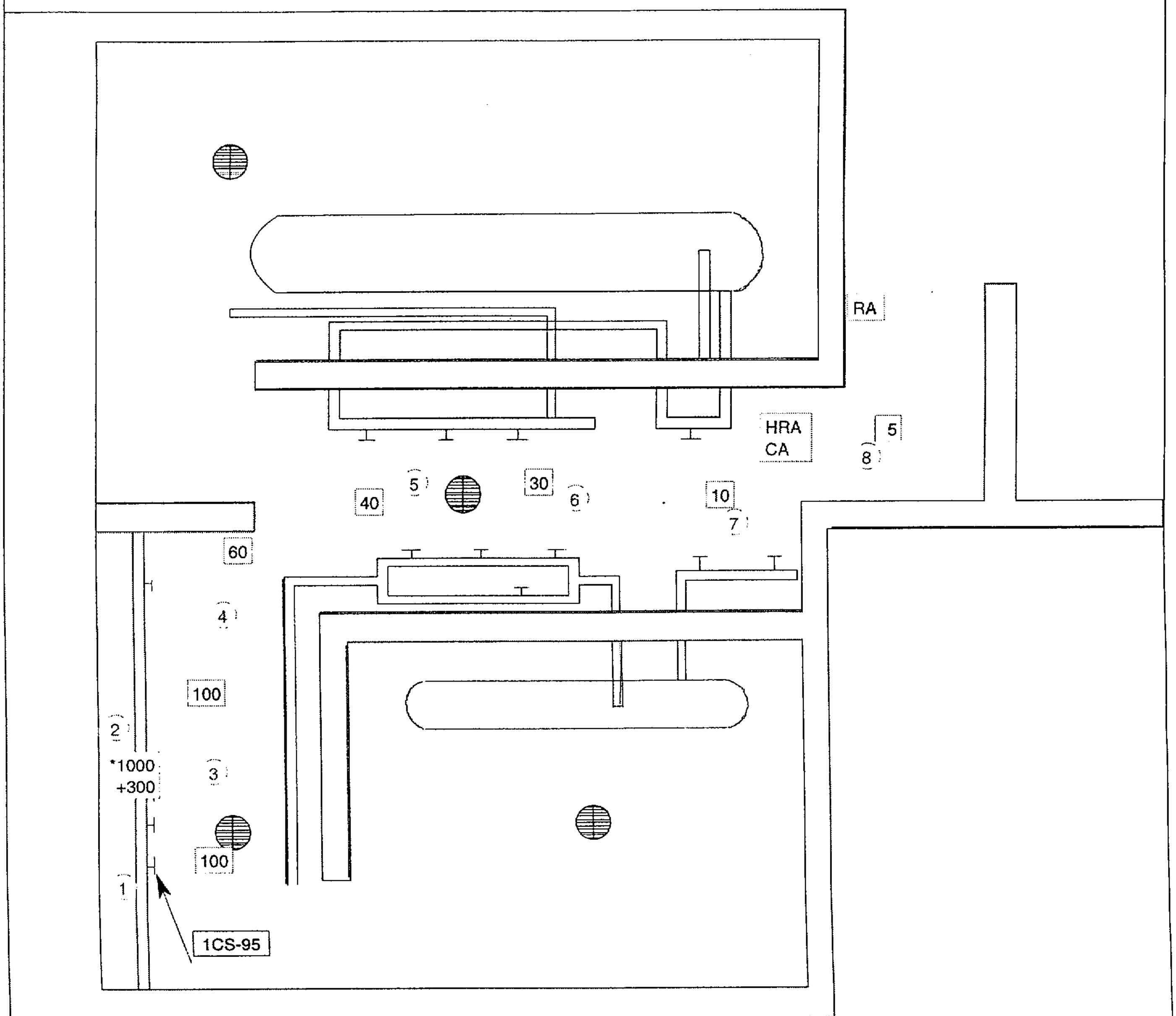
1CS-95, MOD HX BYPASS INLET ISOL VLV, has a clearance hung on it that must be removed.

INITIATING CUES:

You have just been directed to remove the clearance tag from 1CS-95, located in the RAB 236 Letdown Heat Exchanger valve gallery.

Once the tag is removed, you are to OPEN the valve.

RAB 236 Letdown Ht Exchanger V/G	Survey # 082900-1	Date/Time: 08/29/2000 03:30



Comments: RAB 236 Letdow Hx V/G support Ops removing clearance from 1CS-95 Required upon entry survey of travel path only
HP dose received 1.9 mrem

Symbol Legend (For Example Only)			
Dose Rate		HS-50	Hot Spot
*150	Contact Reading	RCA	Posting
+ 75	30 cm Reading		Drip
20	General Area		
15 Smear	15 Air Sample	0 RM	15 Wipe

All dose rates in mrem/hr unless noted

Type: Ops removing clearance	
RWP: 00-0003	
Reactor Power = 100%	

See attached page(s)
for
survey data details

Surveyor: Donald Terry	Reviewed by: Eddie Krajack 8/29/2000

Survey printed on: 09/20/2000 at: 9:12:38 AM

Survey 082900-1 - Data Point Details - Page 1 of 1

Additional Information:

WR/Task #:	N/A
Work Area Code:	A
Component / Tag Name:	N/A
Tag Suffix Name:	N/A
Short Name:	N/A

Instruments Used:

Survey Instruments	ID #
RO-2	2542
L-177	45605
NA	NA
NA	NA

Counted by:

Postings Legend:

RCA = Radiologically Controlled Area
RA = Radiation Area
HRA = High Radiation Area
LHRA = Locked High Radiation Area
VHRA = Very High Radiation Area
ARA = Airborne Radioactivity Area
CA = Contamination Area
RMA = Radioactive Material Area

Dose Rate (DR) Object Prefixes / Suffixes:

* = Contact
+ = 30 cm
HS = Hot Spot
No prefix = General Area Dose Rate
Suffixes: 'n' = Neutron, 'b' = Beta

All dose rates in mrem/hr unless noted

No.	Type	Value	Units	Position	Notes
1	Smear	b/g 250000	DPM/100 cm2	1CS-95	
2	Smear	b/g 30000	DPM/100 cm2	lead shielding	
3	Smear	b/g 100000	DPM/100 cm2	floor	
4	Smear	b/g 40000	DPM/100 cm2	floor	
5	Smear	b/g 20000	DPM/100 cm2	floor	
6	Smear	b/g 30000	DPM/100 cm2	floor	
7	Smear	b/g 15000	DPM/100 cm2	floor	
8	Smear	b/g <1000	DPM/100 cm2	floor	
DR	g	100	mrem/hr		
DR	g	100	mrem/hr		
DR	g	5	mrem/hr		
DR	g	10	mrem/hr		
DR	g	30	mrem/hr		
DR	g	40	mrem/hr		
DR	g	60	mrem/hr		
DR	g	* 1000	mrem/hr		
		+ 300	mrem/hr		
	Text	1CS-95			

Survey printed on: 09/20/2000 at: 9:12:38 AM

```
G_E_N_E_R_A_L  RWP: H00-0003     @@   @@      @@   @@   @@  @@@@        @@  @@@@
               REV: 02          @  @ @  @    @  @ @  @ @  @    @       @  @    @
INITIAL: 11/01/99 13:50         @  @ @  @ === @  @ @  @ @  @ @@@@ REV @  @ @@@@
REVISED: 05/11/00 11:03         @  @ @  @    @  @ @  @ @  @    @       @  @ @
VALID THROUGH: 12/31/00          @@   @@      @@   @@   @@  @@@@        @@  @@@@
ALARA:         GROUP: OPS
```

---------------------------------- LOCATION ----------------------------------

ALL AREAS EXCEPT AREAS POSTED VHRA AND CONTAINMENT WHEN REACTOR CRITICAL.

WORK DESCRIPTION

OPERATIONS ACTIVITIES. TO INCLUDE ROUTINE ROUNDS BY FIRE PROTECTION PERSONNEL.

---------------------------- RADIOLOGICAL CONDITIONS ----------------------------

--DOSE RATES--

GENERAL AREA:	*	MREM/HR
WORK AREA:	*	MREM/HR
MAX READING:	*	MREM/HR
NEUTRON:	*	MREM/HR
BETA:	*	MRAD/HR

--AIR ACTIVITY--

			DAC RATIO
PARTICULATE:	0.0E-00	UCI/CC	<25%
IODINE:		UCI/CC	
GASEOUS:		UCI/CC	

--SMEARABLE CONTAMINATION--

GENERAL AREA:	*	DPM/100CM2
MAX READING:	*	DPM/100CM2

ADMINISTRATIVE DOSE LIMIT: 40 MREM

DOSE ALAMR: 30 MREM

DOSE RATE ALARM: 500 MREM/HR

---------------- REQUIRED DOSIMETRY AND PROTECTIVE EQUIPMENT ----------------

---- DOSIMETRY ----

--- TLD ---   --- SRPDS ---

CHEST

ALARMING DOSIMETER REQUIRED

---- PROTECTIVE CLOTHING ----

DRESS PER INSTRUCTIONS

-------------------------------- INSTRUCTIONS --------------------------------

* REVIEW SURVEYS AT THE RCC FOR SPECIFIC WORK AREA RADIOLOGICAL DATA
1. NOTIFY THE RCC PRIOR TO PERFORMING ANY ACTIVITY WHICH COULD CHANGE RADIOLOGICAL CONDITIONS.
2. NOTIFY RADIATION CONTROL PRIOR TO CLIMBING IN THE OVERHEAD.
3. ALARMING DOSIMETER DOSE ALARM IS 50 MREM AND DOSE RATE ALARM IS 100 MREM/HR IN 'RIMS DOWN' MODE (ADMINISTRATIVE LIMIT STILL APPLIES).
4. IN HIGH NOISE AREAS, USE VIBRATING ALARMING DOSIMETERS OR WEAR ALARMING DOSIMETER OUTSIDE THE PC POCKET.
5. CONTAMINATED SYSTEM BREECHES ON LINES GREATER THAN ONE INCH (1") IN DIAMETER NOT ALLOWED ON THIS RWP.

(INSTRUCTIONS CONTINUED ON NEXT PAGE)

SAMPLING REQUIRED: NONE
BRIEFING REQUIRED: NO
SURVEYS:*

RESPONSIBLE PERSON: OPS MANAGER

APPROVED BY: [signature] DATE: 5/11/00 TIME: 11:00

CP&L - HARRIS PLANT

TERMINATION DATE: __/__/__ TIME: __:__

INSTRUCTIONS (CONTINUED)

TASK DESCRIPTION: CONTAMINATION AREA - UPPER EXTREMITY

DRESS REQUIREMENTS	RADIATION CONTROL COVERAGE
PER INSTRUCTIONS	INTERMITTENT

ADDITIONAL REQUIREMENTS:
1. > 100,000 DPM/100CM2: LABCOAT AND SURGEON GLOVES.
2. < 100,000 DPM/100CM2: SURGEON GLOVES.

TASK DESCRIPTION: CONTAMINATION AREA ENTRIES/WORK <100,000 DPM/100CM2

DRESS REQUIREMENTS	RADIATION CONTROL COVERAGE
PER INSTRUCTIONS	INTERMITTENT

ADDITIONAL REQUIREMENTS:
1. SHOECOVERS AND RUBBER GLOVES REQUIRED AS A MINIMUM.
2. MULTIPLE SURGEON GLOVES MAY BE USED IN LIEU OF RUBBER GLOVES FOR TASKS REQUIRING MANUAL DEXTERITY.
3. FOR CLIMBING OR CRAWLING: FULL SET OF PROTECTIVE CLOTHING AND A CLOTH HOOD.
4. FOR WORK IN A WET ENVIRONMENT: FULL SET OF PROTECTIVE CLOTHING, WATERPROOF BOTTOMS AND PLASTIC SHOECOVERS REQUIRED AS A MINIMUM.

TASK DESCRIPTION: CONTAMINATION AREA ENTRIES/WORK >100,000 DPM/100CM2

DRESS REQUIREMENTS	RADIATION CONTROL COVERAGE
FULL PROTECTIVE CLOTHING	INTERMITTENT

ADDITIONAL REQUIREMENTS:
1. MULTIPLE SURGEON GLOVES MAY BE USED IN LIEU OF RUBBER GLOVES FOR TASKS REQUIRING MANUAL DEXTERITY.
2. FOR CLIMBING OR CRAWLING: FULL SET OF PROTECTIVE CLOTHING AND A CLOTH HOOD.
3. FOR WORK IN A WET ENVIRONMENT: WATERPROOF BOTTOMS AND PLASTIC SHOECOVERS REQUIRED AS A MINIMUM.

TASK DESCRIPTION: LOCKED HIGH RADIATION AREA ENTRIES

DRESS REQUIREMENTS	RADIATION CONTROL COVERAGE
PER INSTRUCTIONS	CONTINUOUS

ADDITIONAL REQUIREMENTS:
1. PRE-JOB BRIEFING REQUIRED.
2. HP SUPERVISOR APPROVAL REQUIRED PRIOR TO EACH ENTRY INTO LHRA'S.
3. CONTINUOUS HP COVERAGE REQUIRED IN LOCKED HIGH RADIATION AREAS.
4. WHEN PERFORMING CONTINUOUS COVERAGE, HP PERSONNEL SHALL NOT ENGAGE IN ANY ACTIVITIES WHICH COULD DISTRACT THEM FROM MONITORING WORKERS AND THE WORK ENVIRONMENT.

(INSTRUCTIONS CONTINUED ON NEXT PAGE) 5/11/00 11:00

INSTRUCTIONS (CONTINUED)

TASK DESCRIPTION: HOT PARTICLE AREA WORK

DRESS REQUIREMENTS	RADIATION CONTROL COVERAGE
FULL PROTECTIVE CLOTHING W/HOOD	INTERMITTENT

ADDITIONAL REQUIREMENTS:
1. FACESHIELD, DOUBLE RUBBER SHOE COVERS AND DOUBLE RUBBER GLOVES.
2. NOTIFY THE RCC PRIOR TO EACH HPA ENTRY.
3. HOT PARTICLE MONITORING REQUIRED UPON EXIT OF HPA.
4. CHANGE OUTER GLOVES OFTEN WHEN HANDLING HOT PARTICLE GENERATING ITEMS.
5. IF ANY HOT PARTICLE AREA WORK INVOLVES BARE SKIN, HP WILL MONITOR AT THE FREQUENCY PER HPP-626.

TASK DESCRIPTION: REMOVAL OF MATERIAL FROM SPENT FUEL POOL

DRESS REQUIREMENTS	RADIATION CONTROL COVERAGE
FULL PROTECTIVE CLOTHING	CONTINUOUS

ADDITIONAL REQUIREMENTS:
1. NOTIFY RADIATION CONTROL PRIOR TO REMOVING ANY MATERIAL FROM THE SPENT FUEL POOL.
2. NOTIFY CONTROL ROOM PRIOR TO ADDING ANY WATER TO THE SPENT FUEL POOL.
3. WIPE/WASH DOWN MATERIAL WHEN REMOVING FROM THE SPENT FUEL POOL.
4. AIRBORNE ENGINEERING CONTROLS AS PER RADIATION CONTROL.

TASK DESCRIPTION: FIRE BRIGADE RESPONSE TO INCLUDE THE RCB WITH THE REACTOR CRITICAL

DRESS REQUIREMENTS	RADIATION CONTROL COVERAGE
PER INSTRUCTIONS	CONTINUOUS

ADDITIONAL REQUIREMENTS:
1. FIRE BRIGADE TEAM MEMBERS SHALL RESPOND UTILIZING TURNOUT GEAR.
2. UTILIZE ELECTRONIC ALARMING DOSIMETERS ATTACHED TO THE SCBA.
3. VERIFY THE ALARMING DOSIMETER IS ON.
4. ADMINISTRATIVE DOSE LIMIT: 1000 MREM
5. ALARM SETPOINT: DOSE ALARM 750 MREM
   : DOSE RATE ALARM 10000 MREM/HR
6. NO ENTRY INTO INCORE SUMP WHEN REACTOR IS CRITICAL.

(END OF INSTRUCTIONS) KQQQQ 5/11/00
1l:00

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-A.1-1

Determination of Inoperable Instrument During Daily Surveillance

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Determination of Inoperable Instrument During Daily Surveillance

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 2.1.18 Importance: SRO NA RO 2.9

K/A Statement: Ability to make accurate, clear and concise logs, records, status boards, and reports.

Task Standard: Determines pressurizer pressure fails to meet acceptance criteria for Daily Surveillance Requirements.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: OST-1021, Daily Surveillance Requirements Daily Interval Mode 1, 2

Validation Time: 5 minutes Time Critical: NO

Candidate: ____________________

Time Start: ______ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ____________________

____

Examiner: ____________________ Date: ______

Signature

Tools/Equipment/Procedures Needed:

OST-1021, Attachment 4, Sheet 3

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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:

You are performing the 0300 set of readings for OST-1021, Daily Surveillance Requirements Daily Interval Mode 1, 2.

INITIATING CUES:

Perform the 0300 Daily Surveillance Requirement for Pressurizer Pressure.

NOTE: FOR PURPOSES OF THIS JPM ONLY, INDEPENDENT VERIFICATION IS NOT REQUIRED.

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates OST-1021, Attachment 4, Sheet 3 NOTES: ***NOTE: Provide candidate with blank copy of sheet.*** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Locates MCB instrumentation STANDARD: Locates MCB meters for Pressurizer Pressure, PI-457, PI-456, and PI-455 NOTES: ***NOTE: Either the MCB meters or ERFIS computer points are to be used, but NOT both. If MCB is used mark JPM Step 3 as "NA".*** ***CUE: Once candidate locates meters, provide the following MCB indications:*** ***- PI-457 2230 psig*** ***- PI-456 Out-of-service*** ***- PI-455 2210 psig*** COMMENTS:	____ SAT ____ UNSAT ____ NA

STEP 3: Locates ERFIS points	
STANDARD: Locates ERFIS points for Pressurizer Pressure, PRC0457, PRC0456, and PRC0455	
NOTES: ***NOTE: Either the MCB meters or ERFIS computer points are to be used, but NOT both. If ERFIS is used mark JPM Step 2 as "NA".*** ***CUE: Once candidate locates ERFIS points, provide the following indications:*** ***- PR0457 2221 psig*** ***- PR0456 Out-of-service*** ***- PR0455 2209 psig***	
	____ SAT
COMMENTS:	____ UNSAT
	____ NA

STEP 4: Records indications from MCB or ERFIS	**CRITICAL STEP**
STANDARD: Records MCB indications as: - PI-457 2230 psig - PI-456 N/A - PI-455 2210 psig **OR** Records ERFIS points as: - PRC0457 2221 psig - PRC0456 N/A - PRC0455 2209 psig	
NOTES: ***CRITICAL TO ALLOW CALCULATING DATA CORRECTLY.***	____ SAT
COMMENTS:	____ UNSAT

STEP 5:	Sums available indications	**CRITICAL STEP**
STANDARD:	Calculates AND records sum of available instruments: MCB meters 4440 psig **OR** ERFIS points 4430 psig	
NOTES:	***CRITICAL TO CALCULATE DATA CORRECTLY.***	____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Determines pressurizer pressure	**CRITICAL STEP**
STANDARD:	Calculates AND records average of available instruments: MCB meters 2220 psig **OR** ERFIS points 2215 psig	
NOTES:	***CRITICAL TO CALCULATE DATA CORRECTLY.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Determines if acceptance criteria met	**CRITICAL STEP**
STANDARD:	Determines acceptance criteria NOT met: If MCB meters used, lowest channel indicates less than 2220 psig (2210 psig) **OR** If ERFIS points used, lowest channel indicates less than 2211 psig (2209 psig)	
NOTES:	***CRITICAL TO IDENTIFY INDICATIONS NOT MEETING ACCEPTANCE CRITERIA.*** ***NOTE: Average of instruments meets acceptance criteria.***	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	Notifies Unit-SCO of discrepancy	
STANDARD:	Notifes Unit-SCO	
NOTES:	***CUE: Unit-SCO acknowledges report.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

You are performing the 0300 set of readings for OST-1021, Daily Surveillance Requirements Daily Interval Mode 1, 2.

INITIATING CUES:

Perform the 0300 Daily Surveillance Requirement for Pressurizer Pressure.

NOTE: FOR PURPOSES OF THIS JPM ONLY, INDEPENDENT VERIFICATION IS NOT REQUIRED.

Daily Surveillance Requirements Log

TECH SPEC	4.2.5; 4.3.1.1.9, 10; 4.3.2.1.1d, 3a3, 3c3, 5c, 6d						
PARAMETER	PRESSURIZER PRESSURE						
INSTRUMENT (MCB OR ERFIS)	PRC0457 PI-457	PRC0456 PI-456	PRC0455 PI-455	CALCULATION COMPLETED	INDEPENDENT VERIFICATION COMPLETED	ACCEPTANCE CRITERIA MET	N/A
ACCEPTANCE CRITERIA	SEE BELOW			N/A	N/A	N/A	CHANNEL CHECK
MODE	1						1, 2, 3
0300							
0900							
1500							
2100							

INSTRUCTIONS

NOTE:
- Calculations must be done with either the MCB Indicators OR ERFIS indications, NOT a combination.
- If all operable channels are greater than or equal to the acceptance criteria, calculations are not required.

CALCULATIONS FOR PRESSURIZER PRESSURE

0300: ________ + ________ + ________ = _______ ÷ (# Operable Channels used Normally 3) = ____________
PRC0457 PI-457 | PRC0456 PI-456 | PRC0455 PI-455 | PRESSURIZER PRESSURE

0900: ________ + ________ + ________ = _______ ÷ (# Operable Channels used Normally 3) = ____________
PRC0457 PI-457 | PRC0456 PI-456 | PRC0455 PI-455 | PRESSURIZER PRESSURE

1500: ________ + ________ + ________ = _______ ÷ (# Operable Channels used Normally 3) = ____________
PRC0457 PI-457 | PRC0456 PI-456 | PRC0455 PI-455 | PRESSURIZER PRESSURE

2100: ________ + ________ + ________ = _______ ÷ (# Operable Channels used Normally 3) = ____________
PRC0457 PI-457 | PRC0456 PI-456 | PRC0455 PI-455 | PRESSURIZER PRESSURE

ACCEPTANCE CRITERIA FOR PRESSURIZER PRESSURE (must meet one of the following):

1. Average of operable MCB indicator channels greater than or equal to 2205 psig.
2. Average of operable ERFIS points greater than or equal to 2202 psig.
3. If three MCB indicators are not available, then the lowest channel should be greater than or equal to 2220 psig.
4. If three ERFIS points are not available, then the lowest channel should be greater than or equal to 2211 psig.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-A.2

Determine Clearance Requirements

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Determine Clearance Requirements

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 2.2.13 Importance: SRO NA RO 3.6

K/A Statement: Knowledge of tagging and clearance tagging procedures.

Task Standard: Complete electrical and mechanical isolation is provided.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: SFD 2165 S-0544, -0545, -0547
OP-137, Auxiliary Feedwater System

Validation Time: 15 minutes Time Critical: NO

Candidate: ______________________________

Time Start: ________ Time Finish: ________

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________________

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OP-137.
SFD 2165 S-0544, -0545, -0547.

NOTE: Answer Key is attached to JPM which identifies those items which must be completed.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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 plant is in Mode 3.

The pump shaft for AFW Pump 1A-SA must be replaced. A clearance is required to be developed.

The S-SO has authorized single valve isolation on the pump discharge.

INITIATING CUES:

You have been directed to determine the clearance requirements using the SFDs and System Operating Procedures. Provide complete electrical and mechanical protection. Provide the necessary vent and drain paths.

NOTE: IT IS NOT INTENDED THAT YOU ACTUALLY GENERATE A CLEARANCE. ONLY PROVIDE THE EVALUATOR WITH A LISTING OF THE REQUIRED COMPONENTS AND POSITIONS.

START TIME: ________

STEP 1:	Locates proper procedure and required information.	
STANDARD:	Locates OP-137, SFD 2165 S-0544, -0545 and -0547	
NOTES:	***NOTE: Answer Key is attached to JPM which identifies those items which must be completed.*** ***JPM steps may be performed in any order since the clearance is not actually being generated.***	
COMMENTS:		____ SAT ____ UNSAT
STEP 2:	Determines electrical clearance requirements for AFW Pump 1A-SA	**CRITICAL STEP**
STANDARD:	Determines electrical supply breaker for AFW Pump 1A-SA to be: • Breaker 1A-SA-4 (RACKED OUT) • DC Control Pwr Knife Switch 1A-SA-4 (OPEN) • MCB hand switch (STOP/AUTO) • ACP hand switch (AS IS)	
NOTES:	***CRITICAL TO PREVENT OPERATION OF PUMP.*** ***NOTE: Tags on MCB and ACP hand switches are information tags and are NOT critical.***	
COMMENTS:		____ SAT ____ UNSAT

STEP 3:	Determines the ESW suction supply to AFW Pump 1A-SA	**CRITICAL STEP**
STANDARD:	Determines the ESW suction supply to be 1SW-123, SW to AFWP 1A SUPPLY VLV: • Breaker 1A35-SA-11A (OFF) • Manual valve operator 1SW-123 (SHUT) • MCB hand switch (SHUT/NORMAL) • ACP hand switch (AS IS)	
NOTES:	***CRITICAL TO PREVENT OPENING SUCTION SOURCE.*** ***NOTE: Tags on MCB and ACP hand switches are information tags and are NOT critical.***	
COMMENTS:		____ SAT ____ UNSAT
STEP 4:	Determines the CST suction supply to AFW Pump 1A-SA	**CRITICAL STEP**
STANDARD:	Determines the CST suction supply to be 1CE-35, CST ISOLATION to 1A-SA AFW PUMP: • Manual valve operator (SHUT)	
NOTES:	***CRITICAL TO PREVENT OPENING SUCTION SOURCE.***	
COMMENTS:		____ SAT ____ UNSAT

STEP 5:	Determines the discharge for AFW Pump 1A-SA	**CRITICAL STEP**
STANDARD:	Determines the discharge to be 1AF-207, AFWP 1A DISCHARGE ISOLATION VALVE: • Manual valve operator (SHUT)	
NOTES:	***CRITICAL TO ISOLATE DISCHARGE OF PUMP.*** ***NOTE: If manual valve operator is in a contaminated and/or high radiation area,***	____ SAT
COMMENTS:		____ UNSAT

STEP 6:	Determines vent path for AFW Pump 1A-SA	**CRITICAL STEP**
STANDARD:	Determines vent path to be 1CE-40, PX INNER ISOLATION VLV on 1A-SA AFW PUMP SUCTION AND 1CE-41, PX OUTER ISOLATION VLV on 1A-SA AFW PUMP SUCTION: • **OPTIONAL** tag on manual valve operator for 1CE-40 (OPEN) • **OPTIONAL** tag on manual valve operator for 1CE-41 (OPEN WITH CAP REMOVED) **OR** Determines vent path to be 1AF-12, PX INNER ISOLATION VLV on 1A-SA AFW PUMP DISCHARGE AND 1AF-13, PX OUTER ISOLATION VLV on 1A-SA AFW PUMP DISCHARGE: • **OPTIONAL** tag on manual valve operator for 1AF-12 (OPEN) • **OPTIONAL** tag on manual valve operator for 1AF-13 (OPEN WITH CAP REMOVED)	
NOTES:	***CRITICAL TO PROVIDE VENT PATH TO DEPRESSURIZE PIPING.*** ***NOTE: Critical to identify vent path valves, but acceptable to state tags NOT required. Vent path is required on EITHER suction OR discharge, but NOT both.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Determines drain path for AFW Pump 1A-SA	**CRITICAL STEP**
STANDARD:	Determines drain path to be 1CE-43, INNER DRAIN VLV on 1A-SA AFW PUMP SUCTION <u>AND</u> 1CE-44, OUTER DRAIN VLV on 1A-SA AFW PUMP SUCTION: • **OPTIONAL** tag on manual valve operator for 1CE-43 (OPEN) • **OPTIONAL** tag on manual valve operator for 1CE-44 (OPEN WITH CAP REMOVED) **OR** Determines drain path to be 1AF-1, INNER DRAIN VLV on 1A-SA AFW PUMP DISCHARGE <u>AND</u> 1AF-2, OUTER DRAIN VLV on 1A-SA AFW PUMP DISCHARGE: • **OPTIONAL** tag on manual valve operator for 1AF-1 (OPEN) • **OPTIONAL** tag on manual valve operator for 1AF-2 (OPEN WITH CAP REMOVED)	
NOTES:	***CRITICAL TO PROVIDE DRAIN PATH TO DRAIN PIPING.*** ***NOTE: Critical to identify vent path valves, but acceptable to state tags NOT required. Drain path is required on EITHER suction OR discharge, but NOT both.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

ANSWER KEY FOR JPM RO-A.2

AFW PUMP 1A-SA	
Breaker 1A-SA-4	RACKED OUT
DC Control Pwr Knife Switch 1A-SA-4	OPEN
MCB Switch (NOT REQUIRED)	STOP/AUTO
ACP Switch (NOT REQUIRED)	AS IS
1SW-123, SW to AFWP 1A SUPPLY VLV	
Breaker 1A35-SA-11A	OFF
Manual Valve Operator	SHUT
MCB Switch (NOT REQUIRED)	SHUT/NORMAL
ACP Switch (NOT REQUIRED)	AS IS
1CE-35, CST ISOLATION to 1A-SA AFW PUMP	
Manual Valve Operator	SHUT
1AF-207, AFWP 1A DISCHARGE ISOLATION VALVE	
Manual Valve Operator	SHUT
1CE-40, PX INNER ISOLATION VLV on 1A-SA AFW PUMP SUCTION (Note 1)	
Manual Valve Operator (TAG NOT REQUIRED)	OPEN
1CE-41, PX OUTER ISOLATION VLV on 1A-SA AFW PUMP SUCTION (Note 1)	
Manual Valve Operator (TAG NOT REQUIRED)	OPEN WITH CAP REMOVED
1CE-43, INNER DRAIN VLV on 1A-SA AFW PUMP SUCTION (Note 1)	
Manual Valve Operator (TAG NOT REQUIRED)	OPEN
1CE-44, OUTER DRAIN VLV on 1A-SA AFW PUMP SUCTION (Note 1)	
Manual Valve Operator (TAG NOT REQUIRED)	OPEN WITH CAP REMOVED
1AF-12, PX INNER ISOLATION VLV on 1A-SA AFW PUMP DISCHARGE (Note 1)	
Manual Valve Operator (TAG NOT REQUIRED)	OPEN
1AF-13, PX OUTER ISOLATION VLV on 1A-SA AFW PUMP DISCHARGE (Note 1)	
Manual Valve Operator (TAG NOT REQUIRED)	OPEN WITH CAP REMOVED
1AF-1, INNER DRAIN VLV on 1A-SA AFW PUMP DISCHARGE (Note 1)	
Manual Valve Operator (TAG NOT REQUIRED)	OPEN
1AF-2, OUTER DRAIN VLV on 1A-SA AFW PUMP DISCHARGE (Note 1)	
Manual Valve Operator (TAG NOT REQUIRED)	OPEN WITH CAP REMOVED

Note 1: Vent and Drain path can be selected for either suction or discharge. Valves must be selected in pairs (1CE-40 and 1CE-41 OR 1AF-12 and 1AF-13 for vent AND 1CE-43 and 1CE-44 OR 1AF-1 and 1AF-2 for drain).

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant is in Mode 3.

The pump shaft for AFW Pump 1A-SA must be replaced. A clearance is required to be developed.

The S-SO has authorized single valve isolation on the pump discharge.

INITIATING CUES:

You have been directed to determine the clearance requirements using the SFDs and System Operating Procedures. Provide complete electrical and mechanical protection. Provide the necessary vent and drain paths.

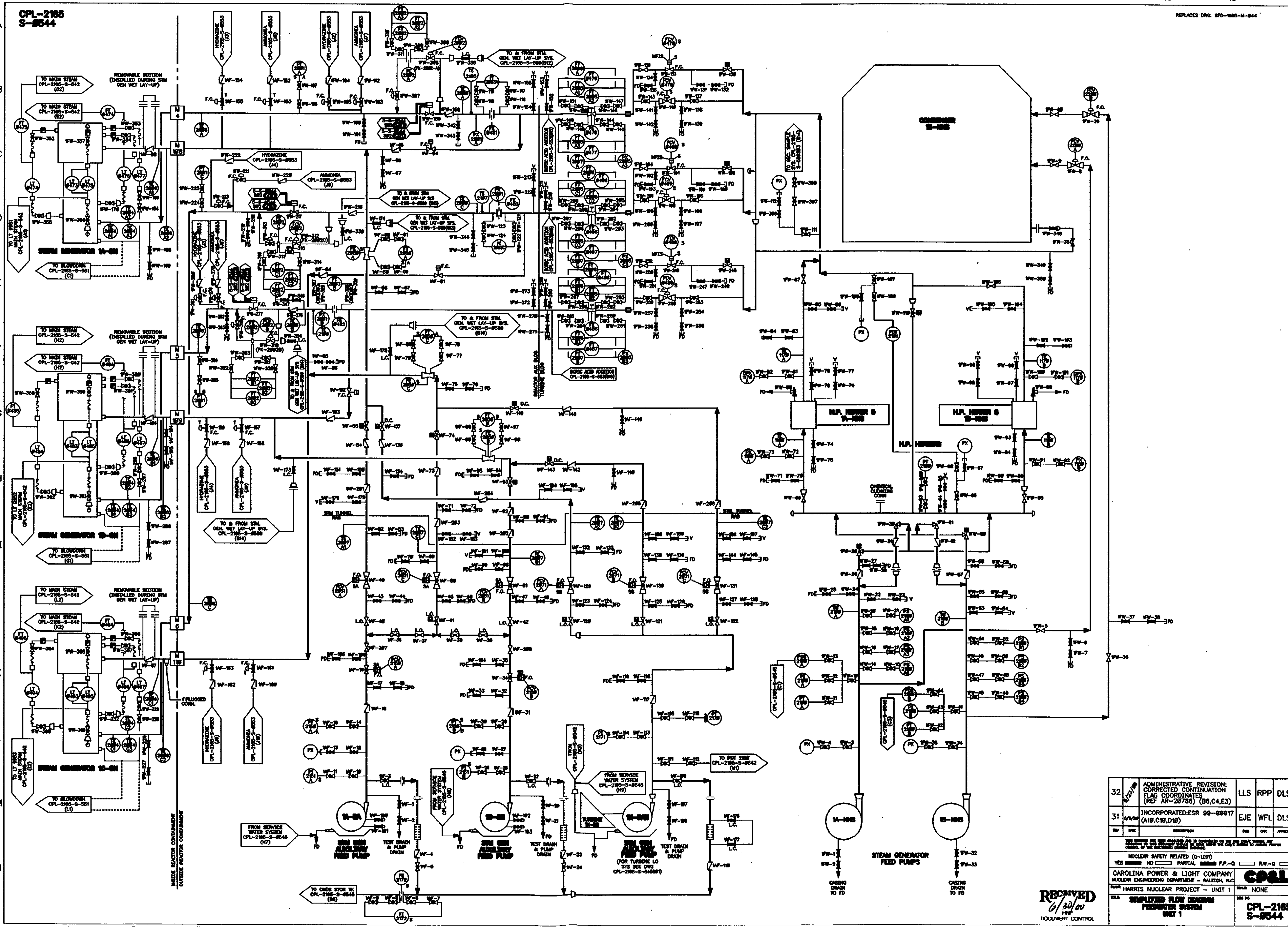
NOTE: IT IS NOT INTENDED THAT YOU ACTUALLY GENERATE A CLEARANCE. ONLY PROVIDE THE EVALUATOR WITH A LISTING OF THE REQUIRED COMPONENTS AND POSITIONS.

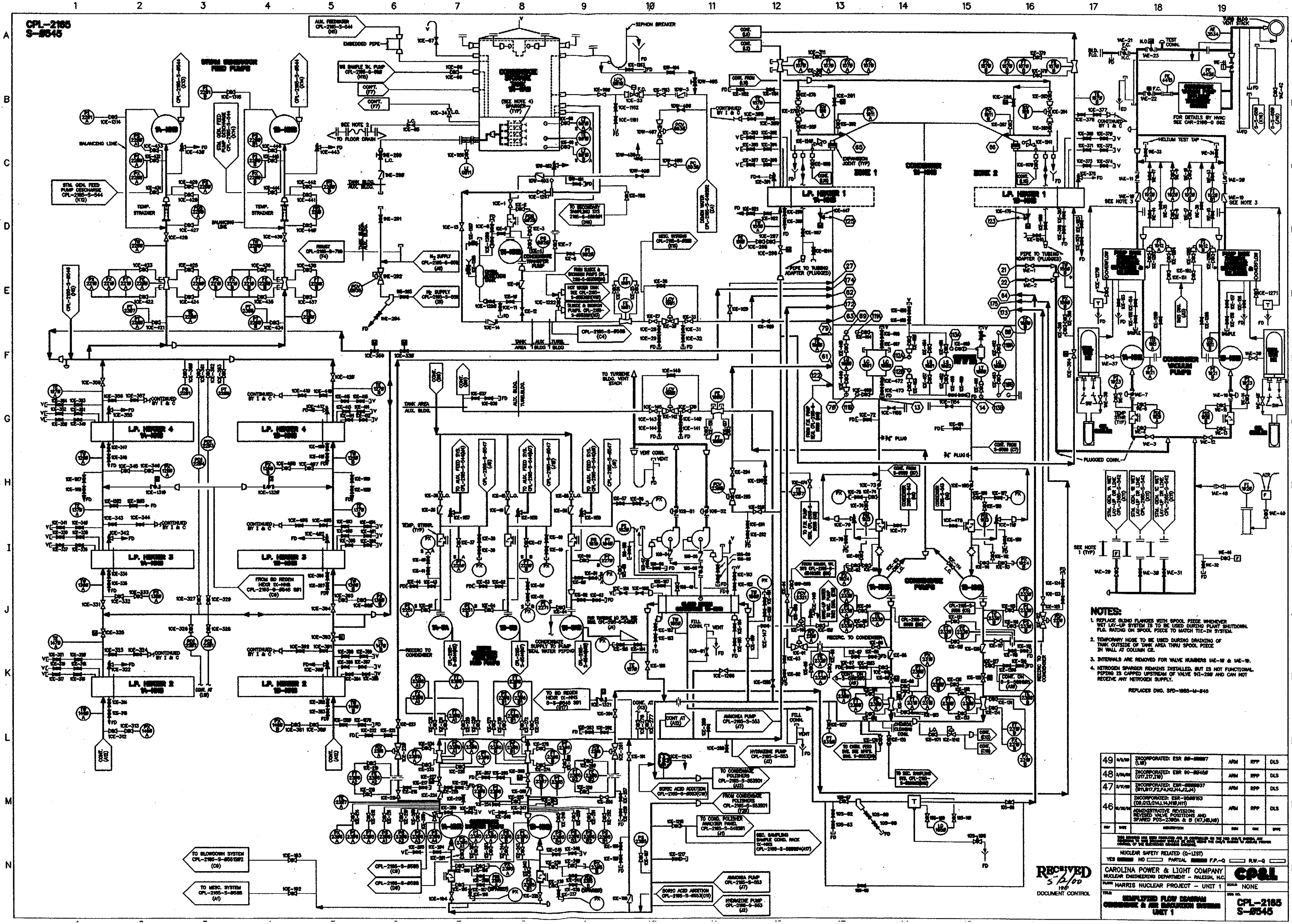
AFW System Electrical Lineup Checklist

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
	RAB 286 Swgr Room A			
1A-SA-4	AFW pump 1A-SA	RACKED IN & CONTROL POWER ON	____	____
1A-SA-4	Mtr Htr Discnt Switch (20A)	ON	____	____
	RAB 286 Swgr Ventilation Room A			
DP-1A2-SA-1B	Aux Feed Pump 1X MO Isol. Vlv. 1AF-143 to B SG	ON	____	____
DP-1A2-SA-1C	Aux Feed Pump 1X MO Isol. Vlv. 1AF-149 to C SG	ON	____	____
DP-1A2-SA-2C	Aux Feed Pump 1X MO Isol. Vlv. 1AF-137 to A SG	ON	____	____
	RAB 286 Swgr Room B			____
1B-SB-3	AFW Pump 1B-SB	RACKED IN & CONTROL POWER ON	____	____
1B-SB-3	Mtr Htr Discnt Switch (20A)	ON	____	____
	RAB 286 Swgr Ventilation Room B			
1B31-SB-9A	1AF-55 Aux Feedwater A Isolation	ON	____	____
1B31-SB-9A	Test Switch	NORM	____	____
1B31-SB-9B	1AF-74 Auxiliary Feedwater C Isolation	ON	____	____
1B31-SB-9B	Test Switch	NORM	____	____
1B31-SB-13B	1AF-93 Auxiliary Feedwater B Isolation	ON	____	____
1B31-SB-13B	Test Switch	NORM	____	____
	RAB 261			
LP-115-17	Terry Turbine Vib Mon	ON	____	____

Service Water System Electrical Lineup Checklist

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
	MCC 1A35-SA (RAB 261)			
1A35-SA-2B	NSW Supply to Header A Isol (1SW-39)	ON		
1A35-SA-9C	SW Return Header A Shutoff (1SW-270)	ON		
1A35-SA-10A	SW Headers Return to NSW (1SW-276)	ON		
1A35-SA-10B	SW Backup to AFWP 1X-SAB (1SW-124)	ON		
1A35-SA-10C	SW Backup to AFWP 1X-SAB (1SW-126)	ON		
1A35-SA-11A	SW Backup to AFWP 1A-SA (1SW-123)	ON		
1A35-SA-11B	SW Backup to AFWP 1A-SA (1SW-121)	ON		
	MCC 1B35-SB (RAB 261)			
1B35-SB-1D	SW Backup to AFWP 1B-SB (1SW-132)	ON		
1B35-SB-2E	SW Backup to AFWP 1X-SAB (1SW-129)	ON		
1B35-SB-5D	SW Return Header B Shutoff (1SW-271)	ON		
1B35-SB-8A	NSW Supply to Header B Isol (1SW-40)	ON		
1B35-SB-11C	SW Backup to AFWP 1X-SAB (1SW-127)	ON		
1B35-SB-13A	SW Backup to AFWP 1B-SB (1SW-130)	ON		
1B35-SB-13B	SW Header B Return to NSW (1SW-274)	ON		
1B35-SB-13C	SW Header A Return to NSW (1SW-275)	ON		


CPL-2165
S-0544
REPLACES DWG. 9FD-1065-M-044
STEAM GENERATOR 1A-SN
STEAM GENERATOR 1B-SN
STEAM GENERATOR 1C-SN
CONDENSER
H.P. HEATER 6
H.P. HEATERS
CHEMICAL CLEANING CONN
STEAM GENERATOR FEED PUMPS
1A-NNS
1B-NNS
STM GEN AUXILIARY FEED PUMP
TURBINE
TEST DRAIN & PUMP DRAIN
FROM SERVICE WATER SYSTEM
CASING DRAIN TO FD
INSIDE REACTOR CONTAINMENT
OUTSIDE REACTOR CONTAINMENT
REACTOR AUX BLDG
TURBINE BLDG
RECEIVED 6/30/00 DOCUMENT CONTROL
32 | 6/23/00 | ADMINISTRATIVE REVISION: CORRECTED CONTINUATION FLAG COORDINATES (REF AR-20786) (B6,C4,E3) | LLS | RPP | DLS
31 | INCORPORATED:ESR 99-00017 (A10,C10,D10) | EJE | WFL | DLS
NUCLEAR SAFETY RELATED (Q-LIST)
YES NO PARTIAL F.P.-Q R.W.-Q
CAROLINA POWER & LIGHT COMPANY
NUCLEAR ENGINEERING DEPARTMENT - RALEIGH, N.C.
CP&L
HARRIS NUCLEAR PROJECT - UNIT 1
NONE
SIMPLIFIED FLOW DIAGRAM
FEEDWATER SYSTEM
UNIT 1
CPL-2165
S-0544



NOTES:

1. REPLACE BLIND FLANGES WITH SPOOL PIECE WHENEVER WET LAY-UP SYSTEM IS TO BE USED DURING PLANT SHUTDOWN. FLG. RATING ON SPOOL PIECE TO MATCH TIE-IN SYSTEM.
2. TEMPORARY HOSE TO BE USED DURING DRAINING OF TANK OUTSIDE OF TANK AREA THRU SPOOL PIECE IN WALL AT COLUMN C2.
3. INTERNALS ARE REMOVED FOR VALVE NUMBERS 1AE-18 & 1AE-19.
4. NITROGEN SPARGER REMAINS INSTALLED, BUT IS NOT FUNCTIONAL. PIPING IS CAPPED UPSTREAM OF VALVE 1NI-298 AND CAN NOT RECEIVE ANY NITROGEN SUPPLY.

REPLACES DWG. SFD-1085-M-046

RECEIVED 5/12/00 HNP DOCUMENT CONTROL

REV	DATE	DESCRIPTION			
49	[illegible]	INCORPORATED: ESR [illegible] (L10)	ARM	RPP	DLS
48	[illegible]	INCORPORATED: ESR 99-[illegible] (G17,I17,I19)	ARM	RPP	DLS
47	[illegible]	INCORPORATED: ESR-[illegible]37 (B11,B17,F2,F4,H2,H4,J2,J4)	ARM	RPP	DLS
46	[illegible]	INCORPORATED: ESR-95[illegible]153 (D9,G13,G14,L14,N10,N11) ADMINISTRATIVE REVISION: REVISED VALVE POSITIONS AND SPARED PDS-2306A & B (N7,N8,N9)	ARM	RPP	DLS

NUCLEAR SAFETY RELATED (Q-LIST)
YES ☐ NO ☐ PARTIAL ☐ F.P.-Q ☐ R.W.-Q ☐

CAROLINA POWER & LIGHT COMPANY
NUCLEAR ENGINEERING DEPARTMENT - RALEIGH, N.C.

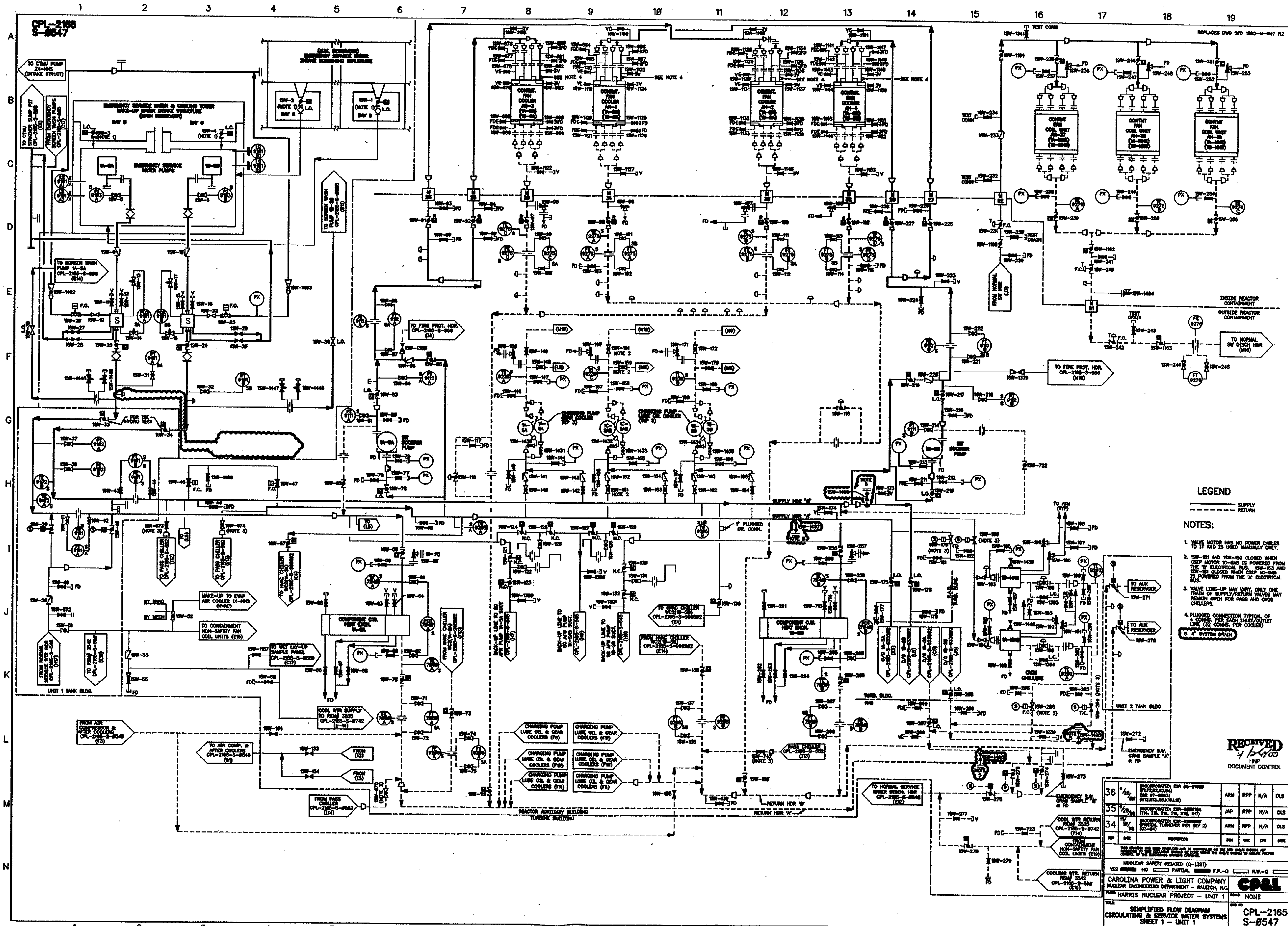
CP&L

PLANT: HARRIS NUCLEAR PROJECT - UNIT 1

SCALE: NONE

TITLE: SIMPLIFIED FLOW DIAGRAM CONDENSATE & AIR EVACUATION SYSTEMS UNIT 1

DWG. NO. CPL-2165 S-0545


CPL-2165
S-Ø547
REPLACES DWG SFD 1965-M-047 R2
LEGEND
SUPPLY
RETURN
NOTES:
1. VALVE MOTOR HAS NO POWER CABLES TO IT AND IS USED MANUALLY ONLY.
2. 1SW-151 AND 1SW-150 CLOSED WHEN CSIP MOTOR 1C-SAB IS POWERED FROM THE 'B' ELECTRICAL BUS. 1SW-153 AND 1SW-151 CLOSED WHEN CSIP 1C-SAB IS POWERED FROM THE 'A' ELECTRICAL BUS.
3. VALVE LINE-UP MAY VARY. ONLY ONE TRAIN OF SUPPLY/RETURN VALVES MAY REMAIN OPEN FOR PASS AND CVCS CHILLERS.
4. PLUGGED CONNECTION TYPICAL OF 4 CONNS. PER EACH INLET/OUTLET LINE (32 CONNS. PER COOLER)
5. 4" SYSTEM DRAIN
INSIDE REACTOR CONTAINMENT
OUTSIDE REACTOR CONTAINMENT
SUPPLY HDR "B"
SUPPLY HDR "A"
RETURN HDR "B"
RETURN HDR "A"
REACTOR AUXILIARY BUILDING
TURBINE BUILDING
UNIT 1 TANK BLDG.
UNIT 2 TANK BLDG
TO AUX RESERVOIR
1SW-271
TO AUX RESERVOIR
1SW-275
TO FIRE PROT. HDR.
TO NORMAL SW DISCH HDR
EMERGENCY S.W. GRAB SAMPLE "A" & FD
EMERGENCY S.W. GRAB SAMPLE "B" & FD
COOL WTR. RETURN
CHARGING PUMP LUBE OIL & GEAR COOLERS
COMPONENT CLG. WATER HEAT EXCH.
SW BOOSTER PUMP
EMERGENCY SERVICE WATER PUMPS
RECEIVED
HNP
DOCUMENT CONTROL
36
35
34
ARM
RPP
N/A
DLS
JAP
NUCLEAR SAFETY RELATED (Q-LIST)
YES
NO
PARTIAL
F.P.-Q
R.W.-Q
CAROLINA POWER & LIGHT COMPANY
NUCLEAR ENGINEERING DEPARTMENT - RALEIGH, N.C.
HARRIS NUCLEAR PROJECT - UNIT 1
NONE
SIMPLIFIED FLOW DIAGRAM
CIRCULATING & SERVICE WATER SYSTEMS
SHEET 1 - UNIT 1
CPL-2165
S-Ø547

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-A.4

Notify State and County Agencies

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Notify State and County Agencies

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 2.4.43 Importance: SRO NA RO 2.8

K/A Statement: Knowledge of emergency communication systems and techniques.

Task Standard: Attachment 9 of PEP-310 has been communicated to all appropriate State and County agencies.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: PEP-310, Notifications and Communications

Validation Time: 10 minutes Time Critical: YES*

**** JPM Step 9 must be completed within 10 minutes.***

Candidate: ______________________________

Time Start: ________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________________

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

Completed PEP-310, Attachment 9, available to hand to candidate.
PEP-310, Attachment 12.

Access to Selective Signaling System phone lines.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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:

A Site Area Emergency has been declared.

PEP-310, Attachment 9, has been completed.

INITIATING CUES:

You are to communicate PEP-310, Attachment 9, to the State and County agencies using the Manual Method on the Selective Signaling System, Attachment 12.

Notification of the event must be completed within the next 10 minutes.

NOTE: THIS IS A TIME CRITICAL JPM.

START TIME: ________

STEP 1:	Locates proper procedure and required information.	
STANDARD:	Locates completed PEP-310, Attachment 9, and PEP-310, Attachment 12	
NOTES:	***NOTE: Provide candidate Attachment 9 with INITIATING CUE.*** ***Attachment 12 provides instructions for the MANUAL METHOD of communicating with the State and County agencies.***	____ SAT
COMMENTS:		____ UNSAT
STEP 2:	Obtain verification code words	**CRITICAL STEP**
STANDARD:	Obtains verification code words from Emergency Communicator desk in MCR	
NOTES:	***CRITICAL TO ALLOW VERIFICATION OF PROPER AGENCIES CONTACTED.***	____ SAT
COMMENTS:		____ UNSAT

STEP 3:	Contact Warning Points from MCR	**CRITICAL STEP**
STANDARD:	Uses Selective Signaling System, dials "10", listens for tone, then dials "22"	
NOTES:	***CUE: Pausing several seconds between each response, respond with the following:*** ***"Chatham County"*** ***"State of North Carolina"*** ***"Lee County"*** ***"Wake County"*** ***"Hartnett County"*** ***CRITICAL TO ALLOW CONTACTING ALL AGENCIES.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Identifies plant and requests roll call	**CRITICAL STEP**
STANDARD:	Says "This is Harris Nuclear Plant, standby" and when responses cease says "This is Harris Nuclear Plant, answer to roll call" "State" "Wake County" "Chatham County" "Hartnett County" "Lee County"	
NOTES:	***CUE: Respond with repeat of agency contacted after each called, i.e., when candidate says "State" respond with "State."*** ***CRITICAL TO ENSURE ALL AGENCIES RECEIVE MESSAGE.***	____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Informs agencies of event classification	**CRITICAL STEP**
STANDARD:	Says "This is the Harris Nuclear Plant. Please record the following information on an Emergency Notification Form."	
NOTES:	***CRITICAL TO ENSURE AGENCIES KNOW EXTENT OF EMERGENCY.***	____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Provides Line 1 information	**CRITICAL STEP**
STANDARD:	Says, "Line 1, this is a drill, initial notification, message #1"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Provides Line 5 information	**CRITICAL STEP**
STANDARD:	Says "Line 5, a Site Area Emergency has been declared."	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 8:	Provides Line 15 information	**CRITICAL STEP**
STANDARD:	Says "Line 15, No recommended protective actions."	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 9:	Records current time and date	**TIME CRITICAL STEP**
STANDARD:	Records current time and date	
NOTES:	***TIME CRITICAL TO HAVE COMPLETED PREVIOUS STEPS WITHIN 10 MINUTES.***	____ SAT
COMMENTS:		____ UNSAT
STEP 10:	Inform agencies of Line 2 data	**CRITICAL STEP**
STANDARD:	Identifies line 2 by stating "Line 2" and reads "Site - Harris", "Unit 1", and "Reported by (CANDIDATE NAME)"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 11:	Inform agencies of Line 3 data	**CRITICAL STEP**
STANDARD:	Identifies line 3 by stating "Line 3" and reads "Transmittal Time/Date - (TIME/DATE RECORDED)" and "Confirmation Telephone Number - 919-362-3493"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT
STEP 12:	Request authenication and record	**CRITICAL STEP**
STANDARD:	Says "State please supply an authenication number," records number on Line 4, locates and responds with corresponding code word "__________", and records code word on Line 4	
NOTES:	***CUE: Respond with authenication number ______.*** ***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 13:	Inform agencies of Line 6 data	**CRITICAL STEP**
STANDARD:	Identifies line 6 by stating "Line 6" and reads "Emergency Declaration at (TIME/DATE)"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT
STEP 14:	Inform agencies of Line 7 data	**CRITICAL STEP**
STANDARD:	Identifies line 7 by stating "Line 7" and reads "EAL 2-1-3, Leakage of primary coolant to secondary coolant with a steam release to the atmosphere"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 15:	Inform agencies of Line 8 data	**CRITICAL STEP**
STANDARD:	Identifies line 8 by stating "Line 8" and reads "Plant Condition Stable"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT
STEP 16:	Inform agencies of Line 9 data	**CRITICAL STEP**
STANDARD:	Identifies line 9 by stating "Line 9" and reads "Reactor Status is shutdown at (TIME/DATE)"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 17:	Inform agencies of Line 10 data	**CRITICAL STEP**
STANDARD:	Identifies line 10 by stating "Line 10" and reads "Emergency Release is occurring"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT
STEP 18:	Inform agencies of Line 11 data	**CRITICAL STEP**
STANDARD:	Identifies line 11 by stating "Lines 11" and states "Type of release is Ground Level, airborne, started (TIME/DATE)"	
NOTES:	***CRITICAL TO PROVIDE CORRECT INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 19:	Inform agencies of lack of Line 12-14 data	
STANDARD:	Identifies lines 12-14 by stating "Lines 12-14" and states "Information is not yet available" (or similar)	
NOTES:		____ SAT
COMMENTS:		____ UNSAT
STEP 20:	Ask if any questions exist	
STANDARD:	Asks if there are any questions	
NOTES:	***CUE: Respond with "No questions."***	____ SAT
COMMENTS:		____ UNSAT

STEP 21:	Inform agencies copies to be sent	
STANDARD:	Says "Copies of this notification will be sent to you via Fax."	
NOTES:		____ SAT
COMMENTS:		____ UNSAT
STEP 22:	Log and record responders	**CRITICAL STEP**
STANDARD:	Says "Respond to roll call with your name" and records name on Attachment 12 of PEP-310 "State" "Chatham County" "Hartnett County" "Lee County" "Wake County"	
NOTES:	***CUE: Respond with the following after each called, i.e., when candidate says "State" respond with "Jones."*** ***State "Jones"*** ***Chatham County "Smith"*** ***Hartnett County "Brown"*** ***Lee County "White"*** ***Wake County "Green"*** ***CRITICAL TO ENSURE ALL AGENCIES RECEIVED INFORMATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 23:	Notify end of notification	
STANDARD:	Says "This is the end of the emergency notification. You may leave the network. This is the Harris Nuclear Plant. Out"	
NOTES:		____ SAT
COMMENTS:		____ UNSAT
STEP 24:	Fax the form to proper agency locations	
STANDARD:	Faxes the form to the applicable WPs	
NOTES:	***CUE: Form has been faxed.***	____ SAT
COMMENTS:		____ UNSAT

STEP 25: Fax the form to proper plant locations STANDARD: Faxes the form to the TSC and EOF NOTES: ***CUE: Form has been faxed.*** COMMENTS:	____ SAT ____ UNSAT
STEP 26: Signs completion of notification STANDARD: Signs name and time/date on Attachment 12 of PEP-310 NOTES: COMMENTS: ***END OF TASK***	____ SAT ____ UNSAT

STOP TIME: ________

INSERT COMPLETED PEP-310, ATTACHMENT 9, HERE.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A Site Area Emergency has been declared.

PEP-310, Attachment 9, has been completed.

INITIATING CUES:

You are to communicate PEP-310, Attachment 9, to the State and County agencies using the Manual Method on the Selective Signaling System, Attachment 12.

Notification of the event must be completed within the next 10 minutes.

NOTE: THIS IS A TIME CRITICAL JPM.

MANUAL STATE/COUNTY EMERGENCY NOTIFICATION FORM MESSAGE# 1

1. ☑A. THIS IS A DRILL ☐B. ACTUAL EMERGENCY ☑INITIAL ☐FOLLOW-UP*
2. Site: HARRIS PLANT Unit: 1 Reported by: (CANDIDATE NAME)
3. Transmittal Time/Date: ______ / / Confirmation Phone Number: 919-362-3493
4. Authentication (If required): ______ (Number) ______ (Codeword)

5. Emergency Classification:
☐A. NOTIFICATION OF AN UNUSUAL EVENT ☐B. ALERT
☑C. SITE AREA EMERGENCY ☐D. GENERAL EMERGENCY

6. ☑A. Emergency Declaration at: ☐B Termination at: Time/Date: (5 MIN AGO - TODAY) / / (If B, go to 16)
7. Emergency Description/Remarks: (EAL 2-1-3) Leakage of primary coolant to secondary coolant with a steam release to the atmosphere

8. Plant Condition: ☐A. Improving ☑B. Stable ☐C. Degrading
9. Reactor Status: ☑A. Shutdown: Time/Date: (20 MIN AGO - TODAY) ☐B. ______% Power
10. Emergency Releases: ☐A. None (go to 14) ☐B. Potential (go to 14) ☑C. Is Occurring ☐D. Has Occurred

**11. Type of Release: ☐Elevated ☑Ground Level

	Started: Time	Date	Stopped: Time	Date
☑A. Airborne	(10 MIN AGO - TODAY)	/	N/A	/ /
☐B. Liquid		/ /		/ /

**12. Release Magnitude: ☐Curies/sec ☐Curies Normal Operating Limits: ☐Below ☐Above
☐A. Noble Gases ______ ☐B. Iodines ______ (NOT AVAILABLE)
☐C. Particulates ______ ☐D. Other ______

**13. Estimate of Projected Offsite Dose: ☐New ☐Unchanged Projection Time: ______
Estimated Duration: ______ Hrs

	TEDE mrem	Thyroid CDE mrem
Site Boundary		
2 Miles		
5 Miles		
10 Miles		

(NOT AVAILABLE)

**14. Meteorological Data: (NOT AVAILABLE)
A.Wind Direction(from)____ ☐B.Speed (mph)____ ☐C.Stability Class____ ☐D Precipitation (type)____

15. RECOMMENDED PROTECTIVE ACTIONS:
☑A. No recommended Protective Actions
☐B. Evacuate ______
☐C. Shelter In-place ______
☐D. Other ______

16. Approved By: John Johnson (Name) SEC (Title) Time/Date: (5 MIN AGO - TODAY)

* If items 8-14 have not changed, only items 1-7 and 15-16 are required to be completed.
** Information may not be available on Initial Notifications

S/C Use Only — Received By: ______ Time: ____ Date: ____ Transmitted By: ______

3.4 Notification of Selected Personnel During an Unusual Event

For an Unusual Event, without staffing of the Emergency Response Facilities, selected personnel are notified using Part "A" of Form PEP-310-8 (Attachment 8).

3.5 State and County Emergency Notifications

CAUTIONS

- Initial notification must occur within 15 minutes after the declaration of an emergency, a change in the classification level or a change in a Protective Action Recommendation.
- Follow-up notification must occur within 60 minutes of the last notification while in a declared emergency.

---

1. Prepare the Notification Message

   A. Prepare the transmitted portion of the Emergency Notification Form (ENF), referring the guidelines in Form PEP-310-10 (Attachment 10) as necessary, by :

      1) Using ERFIS/RTIN to prepare an automated version, or.

      2) Preparing an electronic equivalent of Form PEP-310-9, or hand writing a paper copy of Form PEP-310-9 (Attachment 9).

   B. The SEC-CR (or ERM if the EOF is activated) must review the message content, edit as necessary, and approve it for release.

2. Transmit the Notification Message

NOTES: Once the State and/or County Emergency Operations Centers (EOC's) are activated, they will request that notification be transmitted directly to the EOCs rather than the Warning Points (WPs).

ERFIS/RTIN prepared ENFs simultaneously faxed to each of the WPs and then each of the EOCs.

   A. If the required locations have been sent a copy of the Emergency Notification Form via ERFIS (1.A.1 above), communicate the content of the form using Form PEP-310-11 (Attachment 11, ERFIS Method).

   B. If using the PEP-310-9 Emergency Notification Form (1A.2 above), communicate the content using Form PEP-310-12 (Attachment 12, Manual Method).

State/County Notification Checklist - Manual Method

NOTE: If the Selective Signaling phone is inoperable, use the normal telephone system or the UHF State frequency radio in the TSC or EOF.

1. Contacting the Offsite Authorities:
A. Obtain the **verification code words** from the following storage locations: 1. Emergency Communicator's position notebook in the Main Control Room (MCR). 2. Key locker at the Auxiliary Control Panel (ACP). 3. EOF supply cabinet.
NOTE: If you do not hear a tone, a conference network may already be established.
B. Using the Selective Signaling System, **dial '10'** and listen for a tone.
C. At the tone, perform one of the following: ☐ Dial **22** to contact the **Warning Points** (normally used by the MCR). ☐ Dial **33** to contact the State and County **EOCs** (commonly used by the EOF). ☐ Dial **44** to contact **all Warning Points and EOCs** (during EOC activation, as requested).
D. Wait for the initial response and say: ***"This is the Harris Nuclear Plant, stand by."***
E. After the responses cease, say: ***"This is Harris Nuclear Plant, answer to roll call,"*** ☐ ***"State"*** (Pause for response). ☐ ***"Chatham County"*** (Pause for response). ☐ ***"Harnett County"*** (Pause for response). ☐ ***"Lee County"*** (Pause for response). ☐ ***"Wake County"*** (Pause for response).
F. If one or more organizations did not respond to roll call: 1. Say ***"Standby while I re-dial the missing location(s)"*** 2. Re-enter the appropriate 2 digit code from step "C" above. 3. Repeat the roll call for the missing locations.
G. If a location(s) still does not respond, request an assistant to contact the missing organization(s) by phone (see EPL-001) and read the message to them.
H. Continue with the locations that are on the line.
2. For Initial Notifications (15 minute notification requirements):
A. Say ***"This is the Harris Nuclear Plant, Please record the following information on an Emergency Notification Form."*** (pause to allow the locations to retrieve a form).
B. Say ***"Line 1,*** _____ (Read each checked item) , ***Emergency Notification number*** _____
C. Say ***"Line 5, a*** _____ (state the classification level) ***has been declared/remains in effect."***
D. Say ***"Line 15"*** and then report the PARs as listed.
E. Record the current time and date (24 hour clock) _________/_________.

(Continued on next page)

State/County Notification Checklist - Manual Method

3. Communicate contents of notification form:
A. If not done in step 2, say "***This is the Harris Nuclear Plant. A*** __________(state the classification level) ***continues to be in effect. Please record the following information on an Emergency Notification Form.***" (pause to allow the locations to retrieve a form).
B. Read the form to the responding locations as follows: 1. Identify each line by number before communicating the content. 2. Spell difficult words. 3. Print and provide your name on line 2 of the form for "Reported By:" 4. When you get to line 4, say ***"State please supply an authentication number"*** 5. Respond with the corresponding word from the list of verification code words. 6. Record the authentication information on the form (line 4). 7. Complete reading the remainder of the form.
C. Say ***"are there any questions?"***
D. If necessary, correct any errors or clarify misunderstood information.
E. Say ***"Copies of this notification will be sent to you via Fax."***

4. Completion:
A. Say ***"respond to roll call with your name."***, call roll and record the information below. Identify the applicable location for each agency (WP is not used for notification/communication after EOC is activated).

Agency:	WP:	EOC:	Name of Person Contacted:
State			
Chatham County			
Harnett County			
Lee County			
Wake County.			

B. When completed, say ***"This is the end of the emergency notification. You may leave the network. This is the Harris Nuclear Plant, out."***
C. Fax a copy of the Emergency Notification Form to the applicable WPs and/or EOCs.
D. If performed from the MCR, fax the Emergency Notification Form to the TSC and the EOF.
E. If telecommunications problems were encountered, notify the Help Desk (refer to EPL-001)
F. Manual State/County Notification Completed:________________ ________________ (signature) (date/time)

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM SRO-A.1-1

Determine Main Turbine Loading Information Using Operations Curve Book

CANDIDATE: ____________________

EXAMINER: ____________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Determine Main Turbine Loading Information Using Operations Curve Book

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 2.1.25 Importance: SRO 3.1 RO NA

K/A Statement: Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data.

Task Standard: GP-005, Step 19, completed satisfactorily.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: GP-005, Power Operation (Mode 2 to Mode 1)
Curve G-1

Validation Time: 10 minutes Time Critical: NO

Candidate: ______________________

Time Start: ________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________

____

Examiner: ______________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

GP-005, Section 5.0, completed through Step 18.
Curve G-1.

Values to be entered in GP-005 are:
Step 14) 52
Step 15) 130
Step 16) 150

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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:

A plant startup is being performed per GP-005.

Step 19 is to be completed.

INITIATING CUES:

You are to complete Step 19 of GP-005. Maximum Loading Rate is ONLY to be determined up to 20% power due to fuel loading rate limitations being limiting above 20%.

START TIME: ________

STEP 1:	Locates proper procedure and required information.	
STANDARD:	Locates GP-005 and Curve G-1	
NOTES:	**NOTE: Supply completed copy of GP-005.**	____ SAT
COMMENTS:		____ UNSAT
STEP 2:	Determines Initial Applied Load.	**CRITICAL STEP**
STANDARD:	Refers to Curve G-1 and determines Initial Applied Load to be 45 MWe.	
NOTES:	***CRITICAL TO ENSURE INITIAL LOADING CORRECT.*** ***NOTE: Determined by locating given temperature on bottom axis of curve and locating Initial Applied Load on top axis of curve. Conversion is 9 Mwe = 1%.***	____ SAT
COMMENTS:		____ UNSAT

STEP 3:	Determines Duration of Hold at 5% power	**CRITICAL STEP**
STANDARD:	Refers to Curve G-1 and determines Duration of Hold at 5% power to be 50 minutes$\pm$ 10 minutes	
NOTES:	***CRITICAL TO ENSURE PROPER HEATING OF TURBINE.*** ***NOTE: Determined by taking difference between 5% curve and rolling curve at 150° F line.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Determines Maximum Average Acceleration Rate	**CRITICAL STEP**
STANDARD:	Refers to Curve G-1 and determines Maximum Acceleration Rate to be 40$\pm$ 10 rpm/minute	
NOTES:	***CRITICAL TO ENSURE PROPER HEATING OF TURBINE.*** ***NOTE: Determined by dividing 1800 rpm by time equivalent to intersection of Rolling curve and 150° F line (approximately 3/4 hour).***	____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Determines Maximum Loading Rate	**CRITICAL STEP**
STANDARD:	Refers to Curve G-1 and determines Maximum Loading Rate to be 2.7± 1.0 MWe/minute	
NOTES:	***CRITICAL TO ENSURE PROPER EXPANSION OF TURBINE.*** ***NOTE: Determined by taking difference between time at 20% and intersection of 150° F line (approximately 2.4 hours or 144 minutes) and time at 5% and intersection of 150° F line (approximately 1.6 hours or 96 minutes). Difference is approximately 48 minutes. 15% load change divided by 48 minutes is approximately 0.3% per minute loading rate. Conversion is 9 Mwe = 1%.***	____ SAT
COMMENTS:		____ UNSAT

STEP 6:	Determines Desired Average Acceleration Rate	**CRITICAL STEP**
STANDARD:	Determines Desired Average Acceleration Rate to be ≤ value determined in Step 4 above	
NOTES:	***CUE: If candidate asks for S-SO input on this, direct candidate to determine this value.*** ***CRITICAL TO ENSURE PREVIOUS LIMITS DETERMINED NOT EXCEEDED.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Determines Desired Loading Rate	**CRITICAL STEP**
STANDARD:	Determines Desired Loading Rate to be ≤ value determined in Step 5 above	
NOTES:	***CUE: If candidate asks for S-SO input on this, direct candidate to determine this value.*** ***CRITICAL TO ENSURE PREVIOUS LIMITS DETERMINED NOT EXCEEDED.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

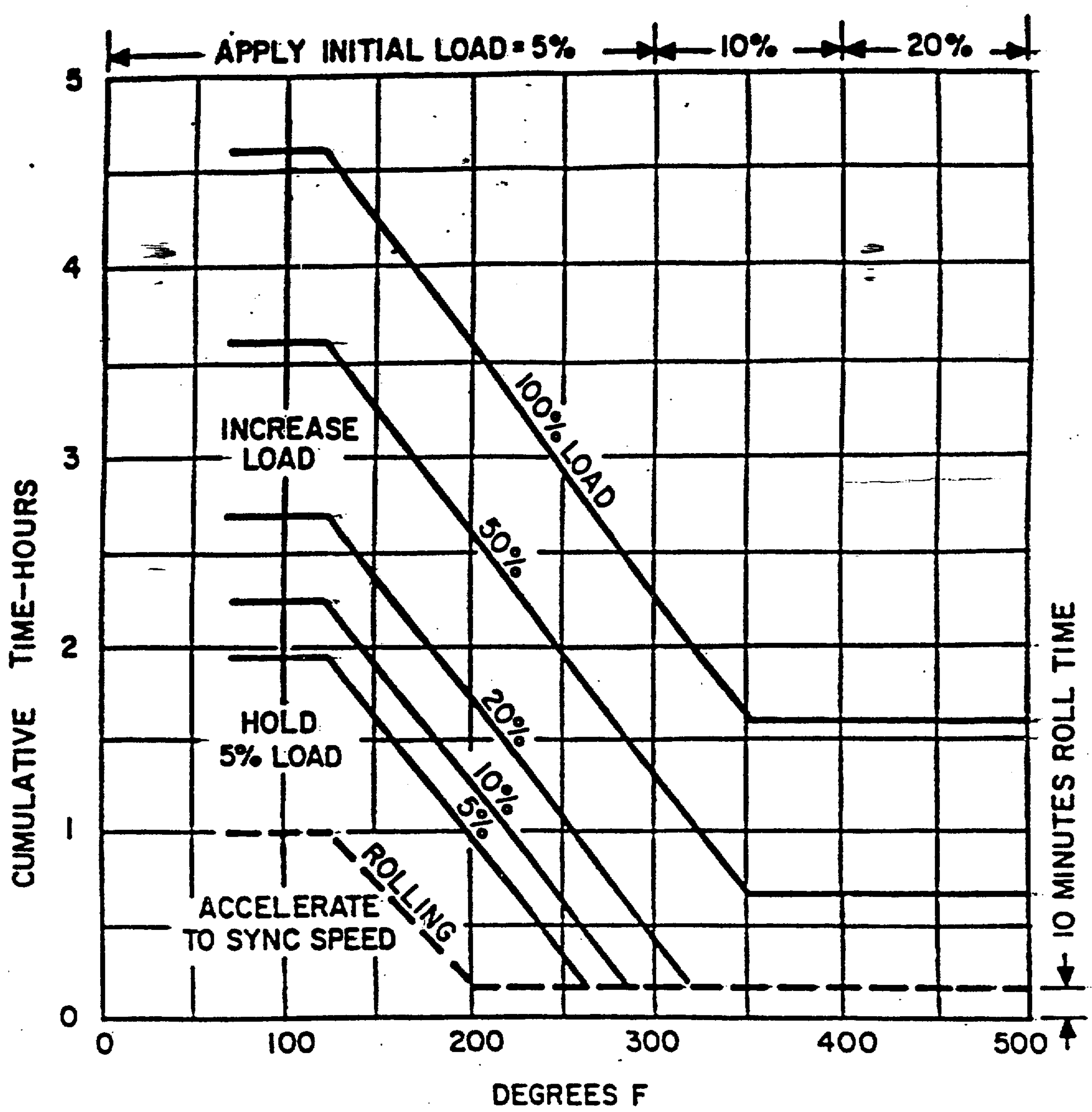
INITIAL CONDITIONS:

A plant startup is being performed per GP-005.

Step 19 is to be completed.

INITIATING CUES:

You are to complete Step 19 of GP-005. Maximum Loading Rate is ONLY to be determined up to 20% power due to fuel loading rate limitations being limiting above 20%.



INITIAL HP TURBINE FIRST-STAGE
METAL TEMPERATURE

6936-BM-093A

Curve No. G-1	Rev 2
Orig	Date 1/7/87
Supv	Date 1/7/87
Op Supv	Date 1-9-87

5.0 PROCEDURE

NOTE:

- If safe and efficient operation of the plant will not be compromised, procedure Steps may be performed simultaneously or out of sequence at the discretion of the Superintendent - Shift Operations.
- All Steps should be initialed when performed or, if the Step is met by existing plant conditions, it may be marked N/A and initialed by the Superintendent - Shift Operations.
- All personnel who initial Steps in this procedure should enter their names and initials on Attachment 3, Certifications and Reviews.

1. Check that Control Bank D rod height is 95 to 115 steps for turbine startup. If rod height is correct, N/A all of Step 5.0.0.02. Otherwise N/A this Step.

2. If Control Bank D rod height is **NOT** 95 to 115 steps, take one of the following actions and N/A the Substep not performed:

   a. Borate or dilute as necessary to position the rods in the target band.

   OR

   b. Develop an alternate rod strategy with the Unit SCO and Reactor Engineering concurrence. N/A

3. Before initial operation above 5% power after refueling, verify Shutdown Margin is greater than 1770 pcm using EST-701.

4. Verify the following exist in preparation for warming up the steamlines:

   a. Main condenser vacuum has been established.

   b. At least one Main Turbine Overspeed Protection System is operable.

   c. R Steam Dump Valves are shut with the Steam Dump Controller in Manual. (Reference 2.5.0.04)

5. Warm-up/pressurize the Main Steam piping and open the MSIVs per OP-126, while maintaining T_{avg} between 555 and 559°F.

6. R When the MSIVs are open, verify the Steam Dump Pressure Controller is set at 84% (1092 PSIG), and the STEAM DUMP MODE SELECTOR Switch is in the STM PRESS position. (Reference 2.5.0.04)

Verified

5.0 PROCEDURE (continued)

NOTE: The initial Steam Dump Controller setpoint is based on operating experience. Some adjustment may be required to maintain T_{avg} between 555 and 559°F.

7. Verify the STM HDR DMP PRESS CONT PK-464.1 in AUTO, and verify steam dumps are operating to maintain T_{avg} between 555 and 559°F.

8. Verify the following MN STEAM PORV Controllers are adjusted to 1135 PSIG (nominal 87%) and in AUTO to accommodate startup:

   PK-308A1 SA

   PK-308B1 SB

   PK-308C1 SA

9. Line up Auxiliary Steam to be supplied from Main Steam.

10. Verify DEH fluid temperature is at least 70°F.

11. While the Main Turbine is on the Turning Gear, check the operation of the Bearing Oil Pumps and Pressure Switches as follows:

   a. Place the 250 VDC battery chargers in parallel operation per OP-156.01.

   b. Verify the DC EMERGENCY BEARING OIL PUMP starts by placing the BRG OIL & SEAL OIL BU FROM MAIN RSVR Switch in STOP PULL TO LOCK, and hold.

NOTE: The Bearing Oil Pump will not start if the Emergency Bearing Oil Pump is operating properly.

   c. Place the BRG OIL & SEAL OIL BU FROM MAIN RSVR switch to AUTO.

NOTE:
- The SEAL OIL BU PUMP FROM MAIN RSVR has an auto start at 13.0 PSIG sensed at PS-01TA-4132. (contact #2)
- The NORMAL BEARING OIL PUMP has an auto start at 11.5 PSIG sensed at PS-01TA-4132. (contact #1)
- Based on the auto start features listed above either or both pumps may start when the DC EMERGENCY BEARING OIL PUMP is stopped.

   d. Check the SEAL OIL BU PUMP FROM MAIN RSVR and/or NORMAL BEARING OIL PUMP start by placing the DC EMERGENCY BEARING OIL PUMP switch to STOP PULL TO LOCK, and hold.

5.0 PROCEDURE (continued)

NOTE: The Emergency Oil Pump will not automatically stop on rising pressure. If the pump is still running when the switch is returned to AUTO, the switch will have to be momentarily turned to STOP to secure the pump.

e. After the Normal Bearing Oil Pump starts, release the DC EMERGENCY BEARING OIL PUMP Switch to AUTO. JB

f. Remove the 250 VDC battery chargers from parallel operation per OP-156.01. JB

12. Verify the following Main Turbine Lube Oil Pumps are in automatic by verifying the following switches are in AUTO:

a. DC EMERGENCY BEARING OIL PUMP AUTO JB

b. BRG OIL & SEAL OIL BU FROM MAIN RSVR AUTO JB

13. At least 1 hour before starting Feedwater Forward Flushing per Step 5.0.0.0122.c, start data collection per ORT-1409. JB

NOTE: 55 PSIG is the maximum pressure allowed for a cold generator. If the generator has not fully cooled, the pressure can be maintained at the present pressure.

14. Verify the Generator hydrogen pressure is 45 psig or above. If pressure is below 45 psig, adjust hydrogen generator pressure to 45 to 55 psig per OP-153.02.

H_2 Pressure 52 PSIG JB

15. Record the lowest LP Turbine inlet metal temperature from ERFIS Computer Points TTA4172 and TTA4171. This temperature is used in Step 5.0.0.017.

Metal Temperature 130 °F JB

16. Record the HP Turbine first stage metal temperature using the Turbine Steam and Metal Temperature recorder MR-1000 or ERFIS Computer Point TTA1061.

Metal temperature 150 °F JB

5.0 PROCEDURE (continued)

NOTE: The following Step assumes that the MSR Controller is functioning properly. If the MSR Computer is not working, then OP-131.04 Section 8.3 provides direction for a manual start of the MSRs.

17. Align the Moisture Separators Reheaters for startup per OP-131.04, using one of the following Sections. N/A the Substep not performed.

    a. Section 5.1 for LP Turbine inlet metal temperature less than 300°F; ß

    OR

    b. Section 5.2 for LP Turbine inlet metal temperature greater than or equal to 300°F. N/A

18. R Using the fuel warranty restrictions listed in Precautions and Limitations 4.0.0.08 and 4.0.0.09, determine the maximum power for which no power ramp rate restriction applies. Power ramp rate is restricted to 3% per hour above this power level. (Reference 2.6.0.06)

    Maximum power level 20 % ß

NOTE: In the following Step, rated Main Turbine load of 900 MWe should be used when converting percent load on Curve G-1 to MWe.

19. Determine the following Main Turbine loading information using Curve G-1 in the Operations Curve Book.

    - Initial Applied Load ________ MWe
    - Duration of Hold at 5% Load ________ MIN
    - Maximum Average Acceleration Rate ________ RPM/MIN
    - Maximum Loading Rate ________ MW/MIN
    - Desired Average Acceleration Rate from Unit SCO ________ RPM/MIN
    - Desired Loading Rate from Unit SCO ________ MW/MIN

    Calculation By ________

    Calculation Verified ________

20. Verify SG level is being controlled between 61% and 71% using the Main Feed System. ________

21. Verify the AFW system is in Automatic Standby Alignment per OP-137. ________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM SRO-A.2

Review of Completed Operations Surveillance Test

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Review of Completed Operations Surveillance Test

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 2.2.12 Importance: SRO 3.4 RO NA

K/A Statement: Knowledge of surveillance procedures.

Task Standard: Identifies the following errors in the performance of OST-1411:
1) Attachment 2, Sheet 3, incorrect calculation in Step 7.1.0.067
2) Attachment 5, Sheet 1, not identified SAT/UNSAT in Step 7.1.0.43

Preferred Evaluation Location: Simulator X In Plant _______

Preferred Evaluation Method: Perform X Simulate _______

References: OST-1411, Auxiliary Feedwater Pump 1X-SAB and 1AF-68, 1AF-106, 1AF-87 Forwatd Flow Operability Test Quarterly Interval Modes 1-3

Validation Time: 20 minutes Time Critical: NO

Candidate: ________________________________

Time Start: _________ Time Finish: _______

Performance Time: _______ minutes

Performance Rating: SAT _______ UNSAT _______

Comments: ____

____

Examiner: ______________________________ Date: _______
Signature

Tools/Equipment/Procedures Needed:

Completed OST-1411 containing watermark stating FOR NRC EXAM USE ONLY.

NOTE: A completed copy of OST-1411 containing watermark stating NRC EXAM KEY is included, identifying the items which are missing / incorrect / outside limits.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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:

OST-1411 has just been completed in its entirety.

No exceptions to satisfactory test performance were noted.

INITIATING CUES:

You are to review the attached OST-1411 for completeness.

If you agree that the test is complete with no exceptions, submit the test to the responsible IST engineer for review. If you note that the test is not complete, or exceptions do exist, identify the exceptions or missed parts of the test.

NOTE THAT ALL INITIALS (PERFORMANCE & VERIFICATION) AND ALL TEST EQUIPMENT USED ARE ASSUMED TO BE VALID.

START TIME: ________

STEP 1: Reviews OST-1411 STANDARD: Reviews given copy of OST-1411 NOTES: ***NOTE: Supply completed copy of OST-1411 marked FOR NRC EXAM USE ONLY.*** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Review body of OST-1411 STANDARD: Reviews body of OST-1411, noting no discrepancies NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Reviews Attachment 1 of OST-1411	
STANDARD:	Reviews Attachment 1 of OST-1411 and notes no discrepancies	
NOTES:		
COMMENTS:		____ SAT ____ UNSAT
STEP 4:	Reviews Attachment 2 of OST-1411	**CRITICAL STEP**
STANDARD:	Reviews Attachment 2 of OST-1411 and notes discrepancy on Sheet 3. Calculation for Step 7.1.083 performed incorrectly.	
NOTES:	***NOTE: Calculation performed by dividing 3712 by 3700 instead of dividing 3700 by 3712.*** ***CRITICAL TO IDENTIFY IMPROPERLY PERFORMED CALCULATION TO ENSURE TEST COMPLETED SATISFACTORILY.***	
COMMENTS:		____ SAT ____ UNSAT

STEP 5:	Reviews Attachment 3 of OST-1411	
STANDARD:	Reviews Attachment 3 of OST-1411 and notes no discrepancies	
NOTES:		____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Reviews Attachment 4 of OST-1411	
STANDARD:	Reviews Attachment 4 of OST-1411 and notes no discrepancies	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Reviews Attachment 5 of OST-1411	**CRITICAL STEP**
STANDARD:	Reviews Attachment 5 of OST-1411 and notes discrepancy. Step 7.1.0.43 (1MS-73) not identified as SAT or UNSAT.	
NOTES:	***NOTE: Either SAT or UNSAT must be circled.*** ***CRITICAL TO IDENTIFY MISSED DOCUMENTATION TO ENSURE TEST COMPLETED SATISFACTORILY.***	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	Reviews Attachment 6 of OST-1411	
STANDARD:	Reviews Attachment 6 of OST-1411 and notes discrepancy.	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 9: Reviews Attachment 7 of OST-1411 STANDARD: Reviews Attachment 7 of OST-1411 and notes no discrepancies NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 10: Reviews Attachment 8 of OST-1411 STANDARD: Reviews Attachment 8 of OST-1411 and notes no discrepancies NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 11:	Reviews Attachment 9 of OST-1411	
STANDARD:	Reviews Attachment 9 of OST-1411 and notes that discrepancies / exceptions not noted. DOES NOT SIGN completion and notifies S-SO.	
NOTES:	***NOTE: Exceptions should have been identified by OST performer.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

OST-1411 has just been completed in its entirety.

No exceptions to satisfactory test performance were noted.

INITIATING CUES:

You are to review the attached OST-1411 for completeness.

If you agree that the test is complete with no exceptions, submit the test to the responsible IST engineer for review. If you note that the test is not complete, or exceptions do exist, identify the exceptions or missed parts of the test.

NOTE THAT ALL INITIALS (PERFORMANCE & VERIFICATION) AND ALL TEST EQUIPMENT USED ARE ASSUMED TO BE VALID.

Performance Data Auxiliary Feedwater Pump 1X-SAB

* Surveillance Requirement 4.7.1.2.1.a.2.a

NOTE 5: $62.31 \times \underset{Dp_{ind}}{\underline{1284}} \times \underset{U_{ind}}{\underline{0.016072}} = \underset{Dp_{corr}}{\underline{1285.9}}$

Dp_{corr} = Corrected Differential Pressure

Dp_{ind} = Indicated Discharge Pressure minus Indicated Suction Pressure

U_{ind} = Specific Volume (ft^3/lbm) for saturated liquid water (υ_f) for suction temperature recorded in Step 7.1.0.061. This number can be determined from Sheet 4 of this Attachment or Standard Steam Tables.

NOTE 6: Satisfactory Tech Spec Acceptance Criteria for pump differential pressure is determined by using the following equation and verifying the calculated differential pressure is greater than 1167 psid.

$(3700 \text{ rpm} \div \underset{\text{Step 7.1.0.055}}{\underline{3712}})^2 \times \underset{\text{Step 7.1.0.081}}{\underline{1285.9}} \text{ psid} = \underset{\text{Step 7.1.0.083}}{\underline{1290.1}} \text{ psid}$

Step	Step Description	Performance Data	Acceptance Criteria
7.1.0.081	Differential Pressure-Pump Calculated per NOTE 5 (Corrected(DP_{corr}))	1285.9 psid	N/A
7.1.0.083	Calculated Differential Pressure Corrected to 3700 rpm per NOTE 6	1290.1 psid	≥ 1167 psid
7.1.0.067	C(B) SG Pressure MCB PI-496.1 SB (PI-486 SB)	940 psig	N/A
7.1.0.068	Steam Supply Pressure (ERFIS point PMS0430 or MCB PI-430.1 SB)	242 psig	> 210 psig *

INCORRECT CALCULATION
SHOULD BE 1277.6

Valve Test Data for Main Steam Valves, Check Valves, and Skid Valves

PRETEST ALIGNMENT			FULL STROKE TEST			POSTTEST ALIGNMENT			ACCEPTANCE CRITERIA (sec)					
									CODE CRITERIA				LIMITING VALUE	
				STROKE TIME (sec)					OPEN		SHUT			
Valve Number	Pretest Position	Init	Verification of Travel by Ind Lights (Init)	OPEN	SHUT	Post Test Position	Pos Init	Verf Init	LOW	HIGH	LOW	HIGH	OPEN	SHUT
1MS-70	SHUT	JB	JB	42.61	43.84	SHUT	JB	DV	38.69	52.33	37.44	50.64	60.70	60.70
1MS-72	SHUT	JB	JB	44.31	39.74	SHUT	JB	DV	36.89	49.91	35.31	47.75	60.70	60.70
1MS-T (Trip & Throttle Valve)	OPEN	JB	JB	14.16	13.62	OPEN	JB	DV	N/A	N/A	N/A	N/A	14.60	13.90

VALVE NUMBER	ACCEPTANCE CRITERIA	STEP	SAT/UNSAT (Circle one)
1AF-204	TAF2007B temperature less than 135° verifies stroke close.	7.1.0.01	SAT / UNSAT
1AF-205	TAF2007D temperature less than 135° verifies stroke close.	7.1.0.01	SAT / UNSAT
1AF-206	TAF2007F temperature less than 135° verifies stroke close.	7.1.0.01	SAT / UNSAT
1MS-71 (1MS-73)	Proper startup of the TDAFW pump verifies partial stroke open.	7.1.0.043	SAT / UNSAT
1MS-G (Governing Valve)	Proper startup of the TDAFW pump verifies proper governor valve operation.	7.1.0.043	SAT / UNSAT
1CE-56	Pump Flow ≥ 89 gpm satisfies partial stroke open.	7.1.0.052	SAT / UNSAT
1AF-110	Pump Flow ≥ 81 gpm satisfies full stroke open.	7.1.0.053	SAT / UNSAT
1MS-73 (1MS-71)	Proper operation of the TDAFW pump verifies partial stroke open.	7.1.0.069	SAT / UNSAT

Comments: ______

MISSED DOCUMENTATION
MUST BE MARKED
SAT or UNSAT

C
CONTINUOUS
USE

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 9

PROCEDURE TYPE: Operations Surveillance Test

NUMBER: OST-1411

TITLE: Auxiliary Feedwater Pump 1X-SAB
and 1AF-68, 1AF-106, 1AF-87 Forward Flow
Operability Test
Quarterly Interval
Modes 1 - 3

<u>NOTE</u>: This procedure has been screened per PLP-100 criteria and determined to be a CASE III procedure. No additional management involvement is required.

Table of Contents

1.0 PURPOSE

1. This test demonstrates the operability of Auxiliary Feedwater Pump 1X-SAB and associated valves at least once every 92 days by satisfying the following Technical Specification Surveillance Requirements:

   - 4.7.1.2.1.a.2.a
   - 4.3.2.1, Table 4.3-2 Item 6a
   - 4.0.5

2. This test also satisfies Surveillance Requirement 4.6.3.1 for Containment Isolation Valve operability following maintenance.

3. This test also performs the following as required for IST testing:

   - partial stroke open testing of:
     - 1CE-56, CST Suction Check Valve to 1X-SAB AFW Pump
     - 1MS-71, MS Line B to Stm Driven Aux FW Turb Ck Vlv
     - 1MS-73, MS Line C to Stm Driven Aux FW Turb Ck Vlv
   - full stroke open testing of:
     - 1AF-110, Aux Feed Pmp 1X Recirc to CST Check Valve
     - 1AF-68, A SG Preheater Bypass Header Chk Valve
     - 1AF-106, B SG Preheater Bypass Header Chk Valve
     - 1AF-87, C SG Preheater Bypass Header Chk Valve
   - stroke close testing of:
     - 1AF-204
     - 1AF-205
     - 1AF-206
   - Proper operation of the TDAFW Governor valve and T&T valve.

4. This test locally trips the Trip and Throttle Valve to assure
R freedom of movement for the trip mechanism. (Reference 2.7.0.03)

2.0 REFERENCES

2.1 Plant Operating Manual Procedures

1. OP-126
2. OP-137
3. SD-137
4. ISI-111
5. ISI-800
6. ISI-801

2.2 Technical Specifications

1. 3.7.1.2
2. 4.6.3.1
3. 4.7.1.2.1.a.2.a
4. 4.3.2.1 Table 4.3-2 Item 6a
5. 4.0.5

2.3 Final Safety Analysis Report

1. 7.3.2
2. 10.4.9
3. 10.4.9a
4. TMI Appendix

2.4 Drawings

1. 5-S-0542, Main Steam System
2. 5-S-0544, Feedwater System
3. 5-S-0545, Condensate & Air Evacuation Systems

2.5 Technical Manuals

1. VM-BJH-VO2, Pumps, Tur Drvn Aux Feedwater
2. VM-MDY, Turbine, AFW Pump
3. VM-MDZ, Valves

2.6 Corrective Action Program (CAP) Items

1. 86H0138

2.7 Other

1. Curve H-X-19, TDAFWP Recirculation Flow vs Pump Speed
2. ESR 95-01007
3. SOER 89-1, Testing of Steam Turbine/Pump Overspeed Trip Devices
4. HNP-IST-002, HNP IST Program - 2nd Interval

3.0 PREREQUISITES

1. Review the Main Control Room Status File and verify that the system is aligned in a manner that will support the performance of this test. ~~β~~

2. Coordinate the performance of this OST with other plant evolutions such that the minimum equipment operating requirements of Tech Specs are met. ~~β~~

3. Obtain any tools and equipment required per Section 5.0. ~~β~~

4. Verify instrumentation needed for the performance of this test is free of deficiencies that may affect instrument indication. ~~β~~

5. If ERFIS point PAF2170 is **NOT** available to determine discharge pressure, initiate a WR/JO to have a Digital Multimeter, with at least ± 0.010 VDC accuracy, connected to TP5 of Card 0235 in PIC-10 to measure 1 to 5 VDC output. (Otherwise N/A this Step) N/A

6. Complete the Calibration Data Sheet and verify instrumentation is within calibration. ~~β~~

7. Verify Maintenance support is available to support the performance of this test with the installation of a 0 to 60 psig liquid filled test gauge (or gauge with a snubber), with an accuracy of ± 2% of span, at 1CE-64-V2, PI-2271 Instrument Valve and for jumper installation. ~~β~~

8. Tavg is greater than or equal to 425°F. ~~β~~

9. Verify personnel taking vibration measurements are qualified per Reference 2.1.0.04. ~~β~~

10. Notify Health Physics of approximate start time, so they can evaluate if any actions are required to prevent the steam coming from the floor drains from contaminating a clean area. ~~β~~

11. The Unit SCO has been informed that the performance of this OST during MODE 1, 2, or 3 initiates an LCO per Technical Specification 3.7.1.2. ~~β~~

12. Verify all prerequisites are met, then obtain Unit SCO permission to perform this OST.

Bob Oswood
Signature

TODAY
Date

4.0 PRECAUTIONS AND LIMITATIONS

1. Only one Auxiliary Feedwater Pump shall be tested at a time.

2. The TDAFW pump should **NOT** be operated below the following minimum
R flow requirements. (Reference 2.6.0.01)

   a. Pump operation of less than or equal to 60 minutes:

      - within the acceptable range of Curve H-X-19 (this is normally provided by the minimum flow line.)

   b. Pump operation greater than 60 minutes but less than or equal to three (3) hours:

      - 275 gpm (138 KPPH)

   c. Pump operation greater than 3 hours:

      - 375 gpm (188 KPPH)

3. If an AFW initiation signal is received during the performance of this test, terminate this test and perform Attachment 8 while maintaining 1MS-70 SA, MAIN STEAM B TO AUX FW TURBINE, and 1MS-72 SB, MAIN STEAM C TO AUX FW TURBINE, open.

4. Before admitting steam to the Auxiliary Feedwater Pump 1X-SAB personnel should be cautioned to stand clear of the pumps atmospheric exhaust.

5. If any valve stroke time falls outside its Code Criteria, the valve will be retested per the retest instructions as soon as possible or declared inoperable.

5.0 TOOLS AND EQUIPMENT

1. Calibrated Vibrometer per ISI-111 with an accuracy of ± 5%

2. Calibrated Stopwatch

3. Two way radios or sound powered phones

4. Handheld Tachometer, if ERFIS is **NOT** available for speed monitoring with an accuracy of ± 2%

5. Handheld Pyrometer, if ERFIS is **NOT** available for temperature monitoring

6. Digital Multimeter that will measure voltage with plus or minus 0.010 VDC accuracy, if ERFIS is **NOT** available for discharge pressure monitoring

7. 0 to 60 psig liquid filled test gauge (or gauge with snubber), with an accuracy of ± 2% of span, Ashcroft or equivalent

8. Jumper

6.0 <u>ACCEPTANCE CRITERIA</u>

1. This test will be completed satisfactorily if the following conditions are verified:

   a. The following valves pass flow in the forward direction as demonstrated on Attachments 3 and 5.

      - 1AF-68, A SG Preheater Bypass Header Chk Valve
      - 1AF-106, B SG Preheater Bypass Header Chk Valve
      - 1AF-87, C SG Preheater Bypass Header Chk Valve
      - 1AF-110, Aux Feed Pmp 1X Recirc to CST Check Valve
      - 1MS-71, MS Line B to Stm Driven Aux FW Turb Ck Vlv
      - 1MS-73, MS Line C to Stm Driven Aux FW Turb Ck Vlv

   b. The following check valves stroke closed as demonstrated on Attachment 5.

      - 1AF-204
      - 1AF-205
      - 1AF-206

   c. The TDAFW governor responds normally during pump start as demonstrated on Attachment 5.

   d. Valves are full stroked with the stroke times less than the Acceptance Criteria listed on Attachments 5, 6 and 7.

2. Auxiliary Feedwater Pump 1X-SAB:

   a. Maintains required pressure and flow with steam being supplied through 1MS-70 and then 1MS-72.

   b. Performance Data is within the Acceptance Criteria listed on Attachment 2.

   c. Vibration Data is within the Acceptance Criteria value listed on Attachment 4.

7.0 PROCEDURE

NOTE: The following Steps should be initialed after this test is completed.

1. If, during the performance of this test, a valve stroke time exceeds its Code Criteria, retest the valve per Attachment 8. (Otherwise N/A this Step) N/A

2. If during the performance of this test, a valve exhibits abnormal or erratic action, document the condition in the comments section of Attachment 9. (Otherwise N/A this Step) N/A

7.1 Auxiliary Feedwater Pump 1X-SAB

NOTE: The following Step will verify proper stroke closed of the indicated check valves.

1. Verify the following computer points are less than 135°F. Document proper stroke closed testing for indicated check valves on Attachment 5.
   - TAF2007B, Turbine Driven AFW to SG A (1AF-204)
   - TAF2007D, Turbine Driven AFW to SG B (1AF-205)
   - TAF2007F, Turbine Driven AFW to SG C (1AF-206)

2. Verify the test gauge is installed at 1CE-64-V2, PI-2271 Instrument Valve.

3. Valve in the suction pressure test gauge installed at 1CE-64-V2, PI-2271 Instrument Valve, on 1X-SAB AFW Pump Suction.

4. From the test gauge at 1CE-64-V2, PI-2271 Instrument Valve, record idle suction pressure on Attachment 2.

5. Perform prestart checks on Auxiliary Feedwater Pump 1X-SAB per OP-137.

6. Establish communications between the Main Control Room and Auxiliary Feedwater Pump 1X-SAB.

NOTE: The shutting of any one valve in Step 7.1.0.09 will initiate an LCO for Auxiliary Feedwater Pump 1X-SAB per Technical Specification 3.7.1.2.

7. Inform the Control Operator and Unit SCO that the Auxiliary Feedwater Pump 1X-SAB will be made inoperable.

8. Record the time and date that Auxiliary Feedwater Pump 1X-SAB was made inoperable on Attachment 9.

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

NOTE: Performance of Step 7.1.0.09 will isolate Auxiliary Feedwater Pump 1X-SAB from the Steam Generators.

9. Refer to Attachment 6 and time test the valves to the Shut position per the following instructions:

   a. Obtain a calibrated stopwatch.

NOTE: Steps 7.1.0.09.b through 7.1.0.09.g are to be signed off when testing of all the valves listed in Attachment 6 are completed.

   b. Verify the valve to be tested is aligned to the Pretest Position and initial on Attachment 6.

   c. Simultaneously start the stopwatch and place the control switch for the valve in test to the position opposite the Pretest Position.

   d. When the valve has completed travel as indicated by a singular position indicating light for the demanded position (no dual indication) stop the stopwatch.

   e. Record the valve stroke time on Attachment 6.

   f. Repeat Step 7.1.0.09.b thru 7.1.0.09.e for all remaining valves to be tested on Attachment 6.

   g. Ensure all stroke times are within the stated Acceptance Criteria and inform the Unit SCO of any out of tolerance reading.

10. At the MCB, verify PDK-2180.1, AUX TURBINE SPD, controller is in AUTO and the setpoint is set at 28%.

11. Verify the valves on Attachment 5 valve test data table are in their Pretest Position and initial in the space provided.

12. At the MCB, simultaneously start the stopwatch and place the control switch for AUX FW TURBINE TRIP & THROTTLE VLV to SHUT.

13. When Aux FW Turbine Trip & Throttle Valve has completed its travel to the shut position as indicated by a singular indicating light (no dual indication) stop the stopwatch.

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

14. Record the Aux FW Turbine Trip & Throttle Valve stroke time on Attachment 5. β

15. At the MCB, simultaneously start the stopwatch and place the control switch for AUX FW TURBINE TRIP & THROTTLE VLV to OPEN. β

16. When Aux FW Turbine Trip & Throttle Valve has completed its travel to the open position as indicated by a singular indicating light (no dual indication), stop the stopwatch. β

17. Record the stroke time for Aux FW Turbine Trip & Throttle Valve in the space provided on Attachment 5. β

18. Initial on Attachment 5 for Aux FW Turbine Trip & Throttle Valve full stroke test. β

NOTE: Step 7.1.0.019 is **NOT** applicable on even numbered months.

19. On odd numbered months perform the following. Otherwise N/A Substeps:

a. R Locally trip Auxiliary Feedwater Pump 1X-SAB by depressing the Manual Trip Lever located on the top of the outside bearing pedestal and verify, by Observation, free movement of the Trip Linkage and Tappet Assembly. (Reference 2.7.0.03) N/A

b. Verify that the Trip & Throttle Valve is shut. N/A

c. Verify ALB-17/7-4, AUX FEEDWATER PUMP TURBINE TRIP, is lit. N/A

d. Locally reset the Mechanical Trip Linkage by pulling the Connecting Rod toward the Trip and Throttle Valve until the rod locks in place. N/A

e. Verify the flat side of the Tappet Nut is against the Tappet Lever (FLAT side toward the Trip and Throttle Valve) and the latch lever is being held by the trip hook. N/A

f. At the MCB, place the control switch for AUX FW TURBINE TRIP & THROTTLE VLV to OPEN. N/A

g. Verify ALB-17/7-4, AUX FEEDWATER PUMP TURBINE TRIP, is **NOT** lit. N/A

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

NOTE: Step 7.1.0.020 is **NOT** applicable on odd numbered months.

20. On even numbered months perform the following. Otherwise N/A Substeps:

    a. Locally trip the Auxiliary Feedwater Pump 1X-SAB by depressing the TURBINE TRIP pushbutton on the Auxiliary Feedwater Control Panel 1X-SAB. ___

    b. Verify that the Trip & Throttle Valve is shut. ___

    c. Verify ALB-17/7-4, AUX FEEDWATER PUMP TURBINE TRIP, is lit. ___

    d. Verify that the Trip & Throttle Valve is latched. ___

    e. At the MCB, place the control switch for AUX FW TURBINE TRIP & THROTTLE VLV to OPEN. ___

    f. Verify ALB-17/7-4, AUX FEEDWATER PUMP TURBINE TRIP, is **NOT** lit. ___

NOTE:
- The following Step will cause ALB-17/7-1 and ALB-17/7-2 to alarm, due to simulating 1MS-70 or 1MS-72 being open.
- Concurrent verification is preferred when installing and removing jumpers.

21. At ARP-19B(SB)(R2), direct Maintenance to install a jumper between terminals 20 and 24. ___

22. Obtain a calibrated stopwatch. ___

23. At the MCB, verify the following valves are open and initial for Pretest Position on Attachment 7:

    - FCV-2071A (1AF-129), SG A ___
    - FCV-2071B (1AF-130), SG B ___
    - FCV-2071C (1AF-131), SG C ___

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

NOTE:
- Steps 7.1.0.024 through 7.1.0.026 will time the TDAFW FCVs shut. It is recommended that only one valve at a time be timed. However, it is permissible to time all three FCVs simultaneously.
- The demand output signal indicator accuracy is 2% for the following controllers:
  - FK-2071A1 SB, AUX FW A REGULATOR 1AF-129
  - FK-2071B1 SB, AUX FW B REGULATOR 1AF-130
  - FK-2071C1 SB, AUX FW C REGULATOR 1AF-131

24. At the MCB, simultaneously start the stopwatch and set the demand output signals for the following controllers at 0%:
    - FK-2071A1 SB, AUX FW A REGULATOR 1AF-129 ____
    - FK-2071B1 SB, AUX FW B REGULATOR 1AF-130 ____
    - FK-2071C1 SB, AUX FW C REGULATOR 1AF-131 ____

25. Stop the stopwatch when the following AUX FW TURBINE FLOW CONTROL VLVS indicate shut:
    - FCV-2071A (1AF-129), SG A ____
    - FCV-2071B (1AF-130), SG B ____
    - FCV-2071C (1AF-131), SG C ____

26. Record the FCV stroke times on Attachment 7. ____

NOTE:
- Steps 7.1.0.027 through 7.1.0.029 will time the TDAFW FCVs open. It is recommended that only one valve at a time be timed. However, it is permissible to time all three FCVs simultaneously.
- The demand output signal indicator accuracy is 2% for the following controllers:
  - FK-2071A1 SB, AUX FW A REGULATOR 1AF-129
  - FK-2071B1 SB, AUX FW B REGULATOR 1AF-130
  - FK-2071C1 SB, AUX FW C REGULATOR 1AF-131

27. At the MCB, simultaneously start the stopwatch and set the demand output signal for the following controllers at 100%:
    - FK-2071A1 SB, AUX FW A REGULATOR 1AF-129 ____
    - FK-2071B1 SB, AUX FW B REGULATOR 1AF-130 ____
    - FK-2071C1 SB, AUX FW C REGULATOR 1AF-131 ____

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

28. Stop the stopwatch when the following AUX FW TURBINE FLOW CONTROL VLVS indicate open:

- FCV-2071A (1AF-129), SG A
- FCV-2071B (1AF-130), SG B
- FCV-2071C (1AF-131), SG C

29. Record the FCV stroke times on Attachment 7.

30. Initial for FULL STROKE TEST on Attachment 7:

- FCV-2071A (1AF-129), SG A
- FCV-2071B (1AF-130), SG B
- FCV-2071C (1AF-131), SG C

31. At the MCB, set the demand output signal for the following controllers to 0%:

- FK-2071A1 SB, AUX FW A REGULATOR 1AF-129
- FK-2071B1 SB, AUX FW B REGULATOR 1AF-130
- FK-2071C1 SB, AUX FW C REGULATOR 1AF-131

32. At the MCB, verify that the following AUX FW TURBINE FLOW CONTROL VLVS shut:

- FCV-2071A (1AF-129), SG A
- FCV-2071B (1AF-130), SG B
- FCV-2071C (1AF-131), SG C

NOTE:
- The following Step will cause the AUX FW TURBINE FLOW CONTROL VLVS to fail open.
- Concurrent verification is preferred when installing and removing jumpers.

33. At ARP-19B(SB)(R2), direct Maintenance to remove the jumper between terminals 20 and 24.

Jumper removed ____

Verified ____

34. At the MCB, verify that the following AUX FW TURBINE FLOW CONTROL VLVS open and initial for FAIL SAFE TEST and Post Test Position Pos Init on Attachment 7:

- FCV-2071A (1AF-129), SG A
- FCV-2071B (1AF-130), SG B
- FCV-2071C (1AF-131), SG C

7.1 <u>Auxiliary Feedwater Pump 1X-SAB</u> (continued)

35. Independently verify the following AUX FW TURBINE FLOW CONTROL VLVS open and initial for Post Test Position Verf Init on Attachment 7:

- FCV-2071A (1AF-129), SG A
- FCV-2071B (1AF-130), SG B
- FCV-2071C (1AF-131), SG C

36. At the MCB, set the demand output signal for the following controllers at 100%: (Reference 2.2.0.04)

- FK-2071A1 SB, AUX FW A REGULATOR 1AF-129 — Verified
- FK-2071B1 SB, AUX FW B REGULATOR 1AF-130 — Verified
- FK-2071C1 SB, AUX FW C REGULATOR 1AF-131 — Verified

37. Determine which steam admission valve to use for starting the Turbine Driven Auxiliary Feedwater Pump as follows:

a. If this is the first or third quarter of the year, use 1MS-70, MAIN STEAM B TO AUX FW TURBINE. (N/A this Step if not used.) N/A

<u>OR</u>

b. If this is the second or fourth quarter of the year, use 1MS-72, MAIN STEAM C TO AUX FW TURBINE. (N/A this Step if not used.)

<u>NOTE</u>: Component nomenclature in parentheses is used to start Auxiliary Feedwater Pump 1X-SAB during the second and fourth quarters of the year.

<u>CAUTION</u>

- Personnel should be cautioned to stand clear of the Auxiliary Feedwater Pump 1X-SAB atmospheric exhaust before admitting steam.
- The following Step starts Auxiliary Feedwater Pump 1X-SAB.

---

38. At the MCB, simultaneously start the stopwatch and position the control switch for 1MS-70 (1MS-72), MAIN STEAM B (C) TO AUX FW TURBINE, to OPEN. (Reference 2.2.0.04)

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

39. When 1MS-70 (1MS-72) has completed its travel to the open position as indicated by a singular indicating light (no dual indication) stop the stopwatch. ß

40. Record stroke time for 1MS-70 (1MS-72) on Attachment 5. ß

41. Record start time for Auxiliary Feedwater Pump 1X-SAB.

Time started: 0145 ß

42. Based on pump speed, verify adequate recirculation flow on local indicator FI-2172S. (Reference 4.0.0.02) ß

43. Verify proper startup of the TDAFW pump, and document partial stroke open of 1MS-71 (1MS-73) and proper governor valve operation on Attachment 5. ß

44. Record B (C) Steam Generator pressure from MCB Indicator PI-486 SB (PI-496.1 SB) on Attachment 2. ß

45. Record steam supply pressure from ERFIS point PMS0430 or MCB Indicator PI-430.1 SB, THROT STM PRESS, on Attachment 2. ß

46. At the MCB, simultaneously start the stopwatch and position the control switch for 1MS-72 (1MS-70), MAIN STEAM C (B) TO AUX FW TURBINE, to OPEN. ß

47. When 1MS-72 (1MS-70) has completed its travel to the open position as indicated by a singular indicating light (no dual indication) stop the stopwatch. ß

48. Record the stroke time for 1MS-72 (1MS-70) on Attachment 5. ß

NOTE:
- Steps 7.1.0.049 through 7.1.0.051 ensure repeatable data by establishing a target speed of 3700 to 3725 rpm and a target flow of 89 to 91 gpm before obtaining pump differential pressure.
- Steps 7.1.0.049 and 7.1.0.050 may need to be repeated until a pump speed of 3700 to 3725 rpm and recirculation flow of 89 to 91 gpm are obtained.
- A calibrated tachometer may be used for turbine speed instead of ERFIS point SAF1978.

49. At the MCB, place PDK-2180.1 in manual and adjust the demand output signal to obtain 3700 to 3725 rpm as indicated by ERFIS Computer Point SAF1978 or handheld tachometer. ß

50. Obtain a recirculation flow of 89 to 91 gpm as indicated on local indicator FI-2172S, by locally unlocking and throttling 1AF-109, AFWP 1X Recirc to CST Isolation. ß

51. Maintain Auxiliary Feedwater Pump 1X-SAB speed 3700 to 3725 rpm and recirculation flow 89 to 91 gpm. ß

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

52. Document partial stroke open of 1CE-56, CST Suction Check Valve to 1X-SAB AFW Pump, as shown by flow greater than 89 gpm, on Attachment 5. ____

53. Document full stroke open of 1AF-110, Aux Feed Pmp 1X Recirc to CST Check Valve, as shown by flow greater than 81 gpm, on Attachment 5. ____

54. Record Auxiliary Feedwater Pump 1X-SAB recirculation flow, as indicated on FI-2172S, on Attachment 2. ____

55. Record Auxiliary Feedwater Pump 1X-SAB speed, as indicated on SAF1978 or handheld tachometer, on Attachment 2. ____

56. Allow the pump to run at stable conditions for at least 2 minutes. ____

57. Record lube oil pressure, from local indicator PI-2181, on Attachment 2. ____

NOTE:
- The IST Program requires all readings to be taken in units of velocity (inches/second).
- To ensure consistent readings are being recorded the vibration data recorded on Attachment 4 should be the values which the qualified operator stored for each point in the Vibrometer.

58. Measure vibration and complete Attachment 4 using the values that were stored in the vibrometer. ____

59. Determine Auxiliary Feedwater Pump 1X-SAB discharge pressure:

a. If ERFIS point PAF2170 is available, record pump discharge pressure on Attachment 2 and N/A Step 7.1.0.059.b. ____

OR

b. If ERFIS point PAF2170 **NOT** available perform the following and N/A Step 7.1.0.059.a:

(1) AT PIC-10, direct Maintenance to connect a DVM, to TP-5 and SIG COM at Card 0235. N/A

(2) At the DVM, installed at Card 0235 in PIC-10, record DC voltage on Attachment 2. N/A

(3) Calculate and record the discharge pressure on Attachment 2. N/A

(4) Independently verify calculation performed in Step 7.1.0.059.b.(3). N/A

(5) At PIC-10 card 0235, direct Maintenance to remove the DVM, from TP-5 and SIG COM. N/A

N/A
Verified

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

60. From installed gauge at 1CE-64-V2, PI-2271 Instrument Valve, record operating suction pressure on Attachment 2.

61. From ERFIS Computer Point TCE9010 or handheld pyrometer, record suction temperature, on Attachment 2.

62. Lock open 1AF-109, AFWP 1X Recirc To CST Isolation.

Verified

NOTE: Component nomenclature in parentheses is used when testing Auxiliary Feedwater Pump 1X-SAB during the second and fourth quarters of the year.

63. At the MCB, simultaneously start the stopwatch and position the control switch for 1MS-70 (1MS-72), MAIN STEAM B (C) TO AUX FW TURBINE, to SHUT.

64. When 1MS-70 (1MS-72) has completed its travel to the shut position as indicated by a singular indicating light(no dual indication) stop the stopwatch.

65. Record stroke time for 1MS-70 (1MS-72) on Attachment 5.

66. Initial for 1MS-70 (1MS-72) Full Stroke Test on Attachment 5.

67. Record C (B) Steam Generator pressure from MCB indicator PI-496.1 SB (PI-486 SB) on Attachment 2.

68. Record steam supply pressure from ERFIS point PMS0430 or MCB indicator PI-430.1 SB, THROT STM PRESS, on Attachment 2.

69. Verify proper TDAFW Pump operation and initial for partial stroke open testing for 1MS-73 (1MS-71) on Attachment 5.

70. At the MCB, simultaneously start the stopwatch and position the control switch for 1MS-72 (1MS-70), MAIN STEAM C (B) TO AUX FW TURBINE to SHUT.

71. When 1MS-72 (1MS-70) has completed its travel to the shut position as indicated by a singular indicating light (no dual indication) stop the stopwatch.

72. Record the stroke time for 1MS-72 (1MS-70) on Attachment 5.

73. Initial for 1MS-72 (1MS-70) Full Stroke Test on Attachment 5.

74. Record the time that Auxiliary Feedwater Pump 1X-SAB was stopped:

Time stopped: 0231

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

75. At the MCB, verify turbine speed is decreasing as indicated by SI-2180.1 SB, TURBINE SPEED. ______

76. At the MCB verify PDK-2180.1, AUX FW TURBINE SPEED, controller is set at 28% and place in AUTO.

AUTO ______

______ Verified

Setpoint at 28% ______

______ Verified

77. Calculate and record suction differential pressure on Attachment 2. ______

78. Independently verify the calculation performed in Step 7.1.0.077. ______

79. Calculate and record pump differential pressure on Attachment 2. ______

80. Independently verify the calculation performed in Step 7.1.0.079. ______

81. Calculate and record the corrected pump differential pressure on Attachment 2. ______

82. Independently verify the calculation performed in Step 7.1.0.081. ______

83. Calculate and record the pump differential pressure corrected to 3700 rpm on Attachment 2. ______

84. Independently verify the calculation performed in Step 7.1.0.083. ______

85. Complete Attachment 5. ______

NOTE: Performance of Step 7.1.0.086 will restore Auxiliary Feedwater Pump 1X-SAB to operable status.

86. Refer to Attachment 6 and time test the valves to the Open position per the following instructions:

a. Obtain a calibrated stopwatch. ______

NOTE: Steps 7.1.0.086.b through 7.1.0.086.e are to be signed off when testing of all the valves listed in Attachment 6 are completed.

b. Simultaneously start the stopwatch and place the control switch for the valve in test to the OPEN position. ______

7.1 Auxiliary Feedwater Pump 1X-SAB (continued)

c. When the valve has completed travel as indicated by a singular position indicating light for the demanded position (no dual indication) stop the stopwatch. ___

d. Record the valve stroke time on Attachment 6. ___

e. Repeat Step 7.1.0.086.b thru 7.1.0.086.d for all remaining valves to be tested on Attachment 6. ___

87. Initial and verify the Post Test Position for 1AF-137, 1AF-143, and 1AF-149 on Attachment 6. ___

88. Inform the Control Operator and Unit SCO that Auxiliary Feedwater Pump 1X-SAB is operable. ___

89. Record the time and date that Auxiliary Feedwater Pump 1X-SAB is operable on Attachment 9. ___

90. Shut 1CE-64-V2, PI-2271 Instrument Valve, and then direct Maintenance to remove the test gauge installed at that valve. ___

91. Verify 1CE-64-V2, PI-2271 Instrument Valve, shut and plugged. ___ Verified

7.2 AFW Check Valve Forward Flow Check

1. Record SG FW Flow from the following MCB indicators on Attachment 3:

   a. FI-0476

   b. FI-0486

   c. FI-0496

2. Independently verify the conversion of MPPH to KPPH in Step 7.2.0.01.

<u>NOTE</u>: Steps 7.2.0.03 and 7.2.0.04 are **NOT** applicable if MCB indicators FI-2003A, B, and C indication is not on scale.

3. Record FW Nozzle Flow from the following MCB indicators on Attachment 3:

   a. FI-2003A

   b. FI-2003B

   c. FI-2003C

4. Independently verify the conversion of MPPH to KPPH in Step 7.2.0.03.

<u>NOTE:</u> Step 7.2.0.05 is **NOT** applicable if Step 7.2.0.03 is completed or if MCB indicators FI-2002A, B, and C indication is not on scale.

5. Record FWIV BYP Flow from the following MCB indicators on Attachment 3:

   a. FI-2002A N/A

   b. FI-2002B N/A

   c. FI-2002C N/A

6. Calculate and record the difference between the SG FW Flow and FW Nozzle Flow or FWIV BYP Flow for the following on Attachment 3:

   a. SG A

   b. SG B

   c. SG C

7. Independently verify the calculations performed in Step 7.2.0.06.

7.3 Test Completion

1. Review Attachments 1 through 8 for completeness. ______

2. Complete applicable portions of Attachment 9, Certifications and Reviews, and inform the Unit SCO that this OST is completed. ______

8.0 DIAGRAMS/ATTACHMENTS

Attachment 1 - Calibration Data Sheet

Attachment 2 - Performance Data Auxiliary Feedwater Pump 1X-SAB

Attachment 3 - Performance Data AFW Check Valve Forward Flow Check

Attachment 4 - Vibration Data

Attachment 5 - Valve Test Data for Main Steam Valves, Check Valves, and Skid Valves

Attachment 6 - Valve Test Data for 1AF-137, 1AF-143, and 1AF-149

Attachment 7 - Valve Test Data for 1AF-129, 1AF-130, and 1AF-131

Attachment 8 - Valve Retest Data Sheet

Attachment 9 - Certifications and Reviews

Calibration Data Sheet

INST/MODEL DESCRIPTION	INST ID NO.	CAL DUE DATE
Calibrated Vibrometer	CT-1845	01-21-01
Calibrated Stopwatch	CT-1448	02-01-01
Digital Multimeter	N/A	N/A
Handheld Pyrometer	N/A	N/A
Handheld Tachometer	N/A	N/A
Pressure Gauge, 0 to 60 psig liquid filled or with snubber Ashcroft (or equivalent)	CT-956	01-12-01

Performance Data Auxiliary Feedwater Pump 1X-SAB

* Surveillance Requirement 4.7.1.2.1.a.2.a

NOTE 1: Normal range is 13 to 17 psig.

NOTE 2: Discharge Pressure is determined by subtracting one (1) from the voltage (VDC) recorded from the DVM in Step 7.1.0.059.b.(2) and then multiplying by 500.

500 x (N/A - 1) = N/A

Step 7.1.0.059.b.(2) (VDC) Step 7.1.0.059.b.(3) (PSIG)

Step	Step Description	Performance Data	Acceptance Criteria
7.1.0.04	Idle Suction Pressure (Installed Gauge at 1CE-64-V2)	24 psig	≥ 15 psig
7.1.0.044	B (C) SG Pressure MCB PI-486 SB (PI-496.1 SB)	940 psig	N/A
7.1.0.045	Steam Supply Pressure (ERFIS point PMS0430 or MCB PI-430.1 SB)	246 psig	>210 psig *
7.1.0.055	Turbine Speed (ERFIS Computer Point SAF1978 or hand held tachometer)	3712 rpm	3700 to 3725 rpm
7.1.0.054	Recirc Flow 1AF-110 (Local FI-2172S)	90 gpm	89 - 91 gpm
7.1.0.057	Lube Oil Pressure PI-2181	15.5 psig	NOTE 1
7.1.0.059.a	Pump Discharge Pressure (ERFIS Point PAF2170)	1306 psig	N/A
7.1.0.059.b.(2)	DC Voltage from DVM installed at RIC-10 Card 0235	N/A VDC	N/A
7.1.0.059.b.(3)	Pump Discharge Pressure per NOTE 2	N/A psig	N/A
7.1.0.060	Operating Suction Pressure (Installed Gauge at 1CE-64-V2)	22 psig	≥ 15 psig
7.1.0.061	Suction Temperature (ERFIS Point TCE9010 or Handheld Pyrometer)	80 °F	N/A

Performance Data Auxiliary Feedwater Pump 1X-SAB

* Surveillance Requirement 4.7.1.2.1.a.2.a

NOTE 5: $62.31 \times \dfrac{1284}{Dp_{ind}} \times \dfrac{0.016072}{U_{ind}} = \dfrac{1285.9}{DP_{corr}}$

Dp_{corr} = Corrected Differential Pressure

Dp_{ind} = Indicated Discharge Pressure minus Indicated Suction Pressure

U_{ind} = Specific Volume (ft³/lbm) for saturated liquid water (v_f) for suction temperature recorded in Step 7.1.0.061. This number can be determined from Sheet 4 of this Attachment or Standard Steam Tables.

NOTE 6: Satisfactory Tech Spec Acceptance Criteria for pump differential pressure is determined by using the following equation and verifying the calculated differential pressure is greater than 1167 psid.

(3700 rpm ÷ 3712 (Step 7.1.0.055))² x 1285.9 psid (Step 7.1.0.081) = 1290.1 psid (Step 7.1.0.083)

Step	Step Description	Performance Data	Acceptance Criteria
7.1.0.081	Differential Pressure-Pump Calculated per NOTE 5 (Corrected(DP_{corr}))	1285.9 psid	N/A
7.1.0.083	Calculated Differential Pressure Corrected to 3700 rpm per NOTE 6	1290.1 psid	≥ 1167 psid
7.1.0.067	C(B) SG Pressure MCB PI-496.1 SB (PI-486 SB)	940 psig	N/A
7.1.0.068	Steam Supply Pressure (ERFIS point PMS0430 or MCB PI-430.1 SB)	242 psig	> 210 psig *

Performance Data Auxiliary Feedwater Pump 1X-SAB

Specific Volume (ft^3/lbm) for Saturated Liquid Water (υ_f)

Temperature (°F)	Water (υ_f)
105	0.016147
104	0.016144
103	0.016140
102	0.016137
101	0.016133
100	0.016130
99	0.016127
98	0.016123
97	0.016120
96	0.016117
95	0.016114
94	0.016111
93	0.016108
92	0.016105
91	0.016102
90	0.016099
89	0.016096
88	0.016093
87	0.016090
86	0.016087
85	0.016085
84	0.016082
83	0.016079
82	0.016077
81	0.016074
80	0.016072
79	0.016070
78	0.016067
77	0.016065
76	0.016063
75	0.016060
74	0.016058
73	0.016056
72	0.016054
71	0.016052
70	0.016050
69	0.016048
68	0.016046
67	0.016044
66	0.016043
65	0.016041
64	0.016039
63	0.016038
62	0.016036
61	0.016035
60	0.016033
59	0.016032

Performance Data Auxiliary Feedwater Pump 1X-SAB

NOTE 3: Differential Press-Suction is determined by subtracting Suction Press recorded in Step 7.1.0.060 from Suction Press recorded in Step 7.1.0.04.

24 - 22 = 2

Step 7.1.0.04 - Step 7.1.0.060 = Step 7.1.0.077

NOTE 4: Differential Pressure-Pump is determined by subtracting Suction Pressure recorded in Step 7.1.0.060 from Discharge Pressure determined in Step 7.1.0.059.a or 7.1.0.059.b.(3).

1306 - 22 = 1284

Step 7.1.0.059.a or Step 7.1.0.059.b.(3) - Step 7.1.0.060 = Step 7.1.0.079 (DP_{ind})

Step	Step Description	Performance Data	Acceptance Criteria
7.1.0.077	Differential Pressure-Suction per NOTE 3	2 psid	≤ 5 psid
7.1.0.079	Differential Pressure-Pump Calculated per NOTE 4 (Non Corrected(DP_{ind}))	1284 psid	1167 - 1356.85 psid

Performance Data AFW Check Valve Forward Flow Check

NOTE 1: FW Flow through the AFW Check Valve is determined by subtracting either FWIV BYP Flow (Steps 7.2.0.05.a, 7.2.0.05.b, and 7.2.0.05.c) or FW Nozzle Flow (Steps 7.2.0.03.a, 7.2.0.03.b and 7.2.0.03.c) from FW Flow (Steps 7.2.0.01.a, 7.2.0.01.b and 7.2.0.01.c).

507 - 260 = 247
Step 7.2.0.01.a - Step 7.2.0.03.a or Step 7.2.0.05.a = Step 7.2.0.06.a

492 - 242 = 250
Step 7.2.0.01.b - Step 7.2.0.03.b or Step 7.2.0.05.b = Step 7.2.0.06.b

505 - 256 = 249
Step 7.2.0.01.c - Step 7.2.0.03.c or Step 7.2.0.05.c = Step 7.2.0.06.c

NOTE 2: To convert MPPH to KPPH use the following formula:

KPPH = MPPH x 1000

Step	Step Description	Performance Data	Acceptance Criteria
7.2.0.01.a	SG A FW Flow (MCB FI-0476) per NOTE 2	507 KPPH	N/A
7.2.0.01.b	SG B FW Flow (MCB FI-0486) per NOTE 2	492 KPPH	N/A
7.2.0.01.c	SG C FW Flow (MCB FI-0496) per NOTE 2	505 KPPH	N/A
7.2.0.03.a	SG A FW Nozzle Flow (MCB FI-2003A) per NOTE 2	260 KPPH	N/A
7.2.0.03.b	SG B FW Nozzle Flow (MCB FI-2003B) per NOTE 2	242 KPPH	N/A
7.2.0.03.c	SG C FW Nozzle Flow (MCB FI-2003C) per NOTE 2	256 KPPH	N/A
7.2.0.05.a	SG A FWIV BYP Flow (MCB FI-2002A)	N/A KPPH	N/A
7.2.0.05.b	SG B FWIV BYP Flow (MCB FI-2002B)	N/A KPPH	N/A
7.2.0.05.c	SG C FWIV BYP Flow (MCB FI-2002C)	N/A KPPH	N/A
7.2.0.06.a	FW Flow through 1AF-68 per NOTE 1	247 KPPH	> 215 KPPH
7.2.0.06.b	FW Flow through 1AF-106 per NOTE 1	250 KPPH	> 215 KPPH
7.2.0.06.c	FW Flow through 1AF-87 per NOTE 1	249 KPPH	> 215 KPPH

Vibration Data

Auxiliary Feedwater Pump 1X-SAB

INSTRUCTIONS:

1. If pump vibration data is greater than the Acceptable Range but within the Alert Range:
   a. Prepare an E-mail or Memo to the Surveillance Testing Scheduling Coordinator directing the test frequency of the pump to be doubled.
   b. Attach a copy of the E-mail or Memo to the test package.

2. If pump vibration data meets the Required Action Criteria:
   a. Declare the pump INOPERABLE.
   b. Initiate a Condition Report (CR).

Parameter	In/Sec	Acceptable Range	Acceptance Criteria	
			Alert Range	Required Action
Inbd Brg Horiz	0.216	≤ 0.325	>0.325 to < 0.70	≥ 0.70 in/sec
Inbd Brg Vert	0.281	< 0.325	>0.325 to < 0.70	> 0.70 in/sec
Outbd Brg Horiz	0.194	< 0.325	>0.325 to < 0.70	> 0.70 in/sec
Outbd Brg Vert	0.187	< 0.325	>0.325 to < 0.70	> 0.70 in/sec
Axial	0.264	≤ 0.325	>0.325 to < 0.70	≥ 0.70 in/sec

Valve Test Data for Main Steam Valves, Check Valves, and Skid Valves

PRETEST ALIGNMENT			FULL STROKE TEST			POSTTEST ALIGNMENT			ACCEPTANCE CRITERIA (sec)					
									CODE CRITERIA				LIMITING VALUE	
				STROKE TIME (sec)					OPEN		SHUT			
Valve Number	Pretest Position	Init	Verification of Travel by Ind Lights (Init)	OPEN	SHUT	Post Test Position	Pos Init	Verf Init	LOW	HIGH	LOW	HIGH	OPEN	SHUT
1MS-70	SHUT	B	B	42.61	43.84	SHUT	B	W	38.69	52.33	37.44	50.64	60.70	60.70
1MS-72	SHUT	B	B	44.31	39.74	SHUT	B	W	36.89	49.91	35.31	47.75	60.70	60.70
1MS-T (Trip & Throttle Valve)	OPEN	B	B	14.16	13.62	OPEN	B	W	N/A	N/A	N/A	N/A	14.60	13.90

VALVE NUMBER	ACCEPTANCE CRITERIA	STEP	SAT/UNSAT (Circle one)
1AF-204	TAF2007B temperature less than 135° verifies stroke close.	7.1.0.01	SAT / UNSAT
1AF-205	TAF2007D temperature less than 135° verifies stroke close.	7.1.0.01	SAT / UNSAT
1AF-206	TAF2007F temperature less than 135° verifies stroke close.	7.1.0.01	SAT / UNSAT
1MS-71 (1MS-73)	Proper startup of the TDAFW pump verifies partial stroke open.	7.1.0.043	SAT / UNSAT
1MS-G (Governing Valve)	Proper startup of the TDAFW pump verifies proper governor valve operation.	7.1.0.043	SAT / UNSAT
1CE-56	Pump Flow ≥ 89 gpm satisfies partial stroke open.	7.1.0.052	SAT / UNSAT
1AF-110	Pump Flow ≥ 81 gpm satisfies full stroke open.	7.1.0.053	SAT / UNSAT
1MS-73 (1MS-71)	Proper operation of the TDAFW pump verifies partial stroke open.	7.1.0.069	SAT / UNSAT

Comments:

Valve Test Data for 1AF-137, 1AF-143, and 1AF-149

NOTE: All spaces next to valve number shall be filled in with initials, data or N/A as applicable.

PRETEST ALIGNMENT			FULL STROKE TEST			POSTTEST ALIGNMENT			ACCEPTANCE CRITERIA (SEC)					
									CODE CRITERIA				LIMITING VALUE	
				Stroke Time (Sec)					OPEN		SHUT			
Valve Number	Pretest Position	Init	Verification of Travel by Ind Lights (Init)	Open	Shut	Post Test Position	Pos Init	Verf Init	LOW	HIGH	LOW	HIGH	OPEN	SHUT
1AF-137	OPEN	JB	JB	14.26	15.11	OPEN	JB	ZW	12.25	16.57	13.11	17.73	21.61	23.13
1AF-143	OPEN	JB	JB	15.79	16.57	OPEN	JB	ZW	12.23	16.53	12.82	17.34	21.57	22.62
1AF-149	OPEN	JB	JB	14.60	16.62	OPEN	JB	ZW	12.92	17.46	13.20	17.84	22.78	23.28

Comments: ____

Valve Test Data for 1AF-129, 1AF-130, and 1AF-131

NOTE: All spaces next to valve number shall be filled in with initials, data or N/A as applicable.

PRETEST ALIGNMENT			FULL STROKE TEST			FAIL SAFE TEST		POSTTEST ALIGNMENT			ACCEPTANCE CRITERIA (SEC)					
											CODE CRITERIA				LIMITING VALUE	
				Stroke Time (Sec)							OPEN		SHUT			
Valve Number	Pretest Position	Init	Verification of Travel by Ind Lights(Init)	OPEN	SHUT	Fail Safe Position	Verified	Post Test Position	Pos Init	Verf Init	LOW	HIGH	LOW	HIGH	OPEN	SHUT
1AF-129	OPEN	JB	JB	10.01	9.63	OPEN	JB	OPEN	JB	ZW	4.75	14.23	4.75	14.25	23.72	15.00
1AF-130	OPEN	JB	JB	9.41	10.06	OPEN	JB	OPEN	JB	ZW	3.58	10.72	4.92	14.76	17.87	15.00
1AF-131	OPEN	JB	JB	8.42	11.65	OPEN	JB	OPEN	JB	ZW	3.48	10.42	4.24	12.72	17.37	15.00

Comments: ____

Valve Retest Data Sheet

NOTE: This entire Attachment is N/A if no valve is retested due to exceeding the Code Criteria.

Determine if the stroke time exceeds the Limiting Value.

1. If the stroke time exceeds the Limiting Value, declare the valve inoperable and initiate a CR. (N/A if stroke time is less than the Limiting Value)

2. If the stroke time is less than the Limiting Value, but outside the Code Criteria limits, perform the following Steps:

   a. If the cause is known to be mechanical failure, or if a retest cannot be performed expeditiously, declare the valve inoperable and initiate a CR.

   b. If retesting the valve is desired, perform the following:

NOTE: If necessary, separate marked up sheets of this OST may be used to document necessary manipulations. These sheets would be attached to this procedure and noted in the comments Section of Attachment 9.

(1) Determine which Steps need to be performed to set up conditions for testing the valve. Unit SCO concurrence must be obtained and documented in the Comments section of Attachment 9.

(2) Perform the Steps determined in the previous Step and document stroke times/valve positioning on Sheet 2.

(3) If retest results are still outside the Code Criteria, declare the valve inoperable and initiate a CR.

(4) If retest results are within the Code Criteria, perform the following:

(a) Declare the valve operable.

(b) Initiate a CR identifying test findings for the first and second tests.

(c) Send test results to Responsible Engineer (IST) for evaluation and documentation on the CR.

Valve Retest Data Sheet

(1) Fill out PRETEST ALIGNMENT, POSTTEST ALIGNMENT, and ACCEPTANCE CRITERIA values for the valve(s) being tested using the values in the initial test Attachment.

PRETEST ALIGNMENT (1)			FULL STROKE TEST		POSTTEST ALIGNMENT (1)			ACCEPTANCE CRITERIA (SEC) (1)					
			Stroke Time (SEC)					CODE CRITERIA				LIMITING VALUE	
								OPEN		SHUT			
Valve Number	Pretest Position	Init	OPEN	SHUT	Post Test Position	Pos Init	Verf Init	Low	High	Low	High	OPEN	SHUT
						N/A							

Certifications and Reviews

This OST was performed as a:

Periodic Surveillance Requirement: B
Post Maintenance Operability Test: ______
Redundant Subsystem Test: ______

Plant Conditions: 100% Mode: 1

OST Completed By: Bob Oswood Date: TODAY Time: 0350

OST Performed By:

Initials	Name (Print)	Initials	Name (Print)
B	Bob Oswood	W	David Varn
TT	Thomas Terden		
JS	John Smith		

General Comments/Recommendations/Corrective Actions/Exceptions:

Step			Time	Date
7.1.0.08	Auxiliary Feedwater Pump 1X-SAB	Inoperable	0100	TODAY
7.1.0.089	Auxiliary Feedwater Pump 1X-SAB	Operable	0307	TODAY

Pages Used: All

OST Completed with NO EXCEPTIONS/EXCEPTIONS:

Reviewed By: ______________ Date: ______
Unit SCO

Reviewed By: ______________ Date: ______
Responsible Engineer (IST)

Reviewed By: ______________ Date: ______
ANII

After receiving the final review signature, this OST becomes a QA RECORD and should be submitted to Document Services.

Revision Summary

General

This revision incorporates ESR 99-00010 for 1MS-70 and 1MS-72 IST data changes, following the establishment of IST Code Criteria after the initial run of this procedure.

Description of Changes

Page	Section	Change Description
All		Increased Revision level to 15.
21	7.3	Deleted Step to notify IST, since the Code Criteria is now in the procedure. Deleted the Step to document task completion. These tasks are going away when passport is implemented.
29	Attachment 5	Added acceptance criteria for 1MS-70 and 1MS-72.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM SRO-A.4

Perform an Emergency Action Level Classification and Recommend Protective Actions

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Perform an Emergency Action Level Classification and Recommend Protective Actions

Alternate Path: NONE

Facility JPM #: CR-127 (Significantly Modified)

K/A Rating: 2.4.41 / 2.4.44 Importance: SRO 4.1 / 4.0 RO NA

K/A Statement: Knowledge of the emergency action level thresholds and classifications. / Knowledge of emergency plan protective action recommendations.

Task Standard: General Emergency determined due to three (3) fission product barriers breached (EAL 2-1-4) AND PARs completed satisfactorily.

Preferred Evaluation Location: Simulator X In Plant _______

Preferred Evaluation Method: Perform X Simulate _______

References: Emergency Action Level Flowpath
PEP-110, Emergency Classification and Protective Action Recommendations

Validation Time: 15 minutes Time Critical: NO

Candidate: ____

Time Start: __________ Time Finish: _______

Performance Time: ______ minutes

NOTE: Performance Rating based on 20% for satisfactory classification during simulator scenario, 20% for satisfactory classification during JPM, and 60% for satisfactory protective action recommendation during JPM.

Performance Rating: SAT _______ UNSAT _______

Comments: ____

____

Examiner: __________________________________ Date: _______
Signature

Tools/Equipment/Procedures Needed:

EAL Flowpaths
PEP-110, Attachment 3

NOTE: Provide Attachments A and B of JPM to candidate as directed in JPM Steps.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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:

Following a reactor trip and safety injection, EOP-PATH-2 is being implemented.

The following plant conditions are noted:

- All CSFSTs are currently satisfied.
- All ESF equipment is functioning.
- One SG Safety is stuck open on SG 'B'.
- SG 'B' level is below the narrow range indication.
- SGs 'A' and 'C' are being controlled at approximately 25% using AFW.
- EPP-014, Faulted Steam Generator Isolation, has been performed for SG 'B'.

INITIATING CUES:

You are to classify this event and recommend any protective actions, if required.

START TIME: ________

STEP 1:	Locates proper procedure and required information.	
STANDARD:	Locates EAL Flowpath and PEP-110	
NOTES:	***NOTE: 1) Not required to reference PEP-110.*** ***2) The following JPM steps are decision points required to be made to obtain the correct EAL classification and are addressed for this reason, although NOT all are considered CRITICAL STEPS.***	____ SAT
COMMENTS:		____ UNSAT
STEP 2:	Determines if any EAL Table 1 Rad Monitors are in high alarm	
STANDARD:	Determines NO EAL Table 1 Rad Monitors are in high alarm	
NOTES:	***NOTE: Once candidate locates EAL Table 1 Rad Monitors on Rad Monitoring Panels, provide Attachment A, "Rad Monitor Indication".***	____ SAT
COMMENTS:		____ UNSAT

STEP 3:	Determines if Core Cooling Status CSF red	
STANDARD:	Determines Core Cooling Status CSF NOT red, and indicates Fuel Intact on FPB Status Board	
NOTES:	***NOTE: All CSFSTs given as being satisfied in initial conditions. Incorrect response to this decision would NOT result in improper classification.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Determines if EOP PATH-2 entered	**CRITICAL STEP**
STANDARD:	Determines EOP PATH-2 entered	
NOTES:	***NOTE: Given in initial conditions.*** ***CRITICAL TO DETERMINE PROPER EAL CLASSIFICATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Determines if any Main Steamline Rad monitor exceeds 20 mR/hr	**CRITICAL STEP**
STANDARD:	Determines Main Steamline Rad monitor 3592 (SG 'B') above 20 mR/hr (21.8 mR/hr), and indicates Fuel AND RCS Breached on FPB Status Board	
NOTES:	***NOTE: Incorrect response to this decision would result in improper classification due to only one barrier being considered breached.*** ***CRITICAL TO DETERMINE PROPER EAL CLASSIFICATION.***	
COMMENTS:		____ SAT ____ UNSAT
STEP 6:	Determines if primary-to-secondary leakage in any SG > 10 gpm	**CRITICAL STEP**
STANDARD:	Determines primary-to-secondary leakage in SG 'B' exceeds 10 gpm based on plant response	
NOTES:	***NOTE: Indicated by elevated rad levels, requirement for reactor trip and safety injection. Incorrect response to this decision would result in improper classification due to Containment NOT being considered breached.*** ***CRITICAL TO DETERMINE PROPER EAL CLASSIFICATION.***	
COMMENTS:		____ SAT ____ UNSAT

STEP 7:	Determines if affected SG safeties shut	**CRITICAL STEP**
STANDARD:	Determines one Safety open on affected SG, and indicates Cnmt Breached on FPB Status Board	
NOTES:	***NOTE: Given in initial conditions. Incorrect response to this decision would result in improper classification due to Containment NOT being considered breached.*** ***CRITICAL TO DETERMINE PROPER EAL CLASSIFICATION.***	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	Determines if all 3 FPBs are breached	**CRITICAL STEP**
STANDARD:	Determines all 3 FPBs are breached	
NOTES:	***NOTE: Incorrect response to this decision would result in improper classification due to only 2 FPBs being considered breached.*** ***CRITICAL TO DETERMINE PROPER EAL CLASSIFICATION.***	____ SAT
COMMENTS:		____ UNSAT

STEP 9:	Determines classification	**CRITICAL STEP**
STANDARD:	Determines General Emergency EAL 2-1-4 exceeded	
NOTES:	***CRITICAL TO DETERMINE PROPER EAL CLASSIFICATION.***	____ SAT
COMMENTS:		____ UNSAT
STEP 10:	Locates proper procedure and required information.	
STANDARD:	Locates Protective Action Recommendation Process in PEP-110, Attachment 3	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 11:	Determines General Emergency has occurred	
STANDARD:	Previously determines General Emergency has occurred	
NOTES:	***NOTE: If candidate does NOT determine EAL Classification to be General Emergency, provide CUE that "IF A GENERAL EMERGENCY WERE THE CLASSIFICATION, PROVIDE RECOMMENDED PROTECTIVE ACTIONS."***	____ SAT
COMMENTS:		____ UNSAT

STEP 12:	Determines status of core damage	**CRITICAL STEP**
STANDARD:	Determines substantial core damage is imminent or has occurred.	
NOTES:	***NOTE: For this type of event, should consider any Fuel Breach sufficient to warrant the determination that substantial core damage has occurred.*** ***CRITICAL TO DETERMINE PROPER PAR.***	____ SAT
COMMENTS:		____ UNSAT

STEP 13:	Determines status of RCS	**CRITICAL STEP**
STANDARD:	Determines significant loss of reactor coolant is imminent or has occurred.	
NOTES:	***NOTE: For this type of event, should consider any RCS Breach sufficient to warrant the determination that significant loss of reactor coolant is imminent or has occurred.*** ***CRITICAL TO DETERMINE PROPER PAR.***	____ SAT
COMMENTS:		____ UNSAT
STEP 14:	Determines status of Containment	**CRITICAL STEP**
STANDARD:	Determines containment failure (S/G) is imminent or has occurred.	
NOTES:	***NOTE: Faulted/Ruptured S/G with a relief valve open is considered to be an indication that a Containment Breach has occurred.*** ***CRITICAL TO DETERMINE PROPER PAR.***	____ SAT
COMMENTS:		____ UNSAT

STEP 15:	Determines wind direction	**CRITICAL STEP**
STANDARD:	Determines wind direction from 220°	
NOTES:	***NOTE: Once candidate locates Meterological Data, provide Attachment B, "Wind Direction and Speed".*** ***CRITICAL TO DETERMINE PROPER PAR.***	____ SAT
COMMENTS:		____ UNSAT

STEP 16:	Determines evacuation areas	**CRITICAL STEP**
STANDARD:	Determines evacuation subzones to be A,B,C,D,E,F,K,L	
NOTES:	***NOTE: Based on 5 mile radius and wind direction.*** ***CRITICAL TO DETERMINE PROPER PAR.***	____ SAT
COMMENTS:		____ UNSAT

STEP 17:	Determines shelter areas	**CRITICAL STEP**
STANDARD:	Determines shelter subzones to be G,H,I,J,M,N	
NOTES:	***NOTE: Based on wind direction.*** ***CRITICAL TO DETERMINE PROPER PAR.***	
		____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE ATTACHMENT B
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

WIND DIRECTION AND SPEED

- Wind Direction is from 220°.
- Wind Speed is 18 mph.

CANDIDATE ATTACHMENT A
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

RADIATION MONITORING PANEL INDICATIONS

- REM-1TV-3536, Turbine Building Stack 3A, is indicating 3.2E-4 uCi/sec, but is **NOT** alarming.
- REM-1TV-3534, Condenser Vacuum Pump Effluent, was in high alarm, but is now decreasing.
- REM-1BD-3527, Steam Generator Blowdown, was in high alarm, but is now decreasing.
- RM-1MS-3591-SB, Main Steam Line 'A', is indicating 0.8 mR/hr, but is **NOT** alarming.
- RM-1MS-3592-SB, Main Steam Line 'B', is indicating 21.8 mR/hr, but is **NOT** alarming.
- RM-1MS-3593-SB, Main Steam Line 'C', is indicating 0.7 mR/hr, but is **NOT** alarming.
- All other radiation monitors indicate normal.

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

Following a reactor trip and safety injection, EOP-PATH-2 is being implemented.

The following plant conditions are noted:

- All CSFSTs are currently satisfied.
- All ESF equipment is functioning.
- One SG Safety is stuck open on SG 'B'.
- SG 'B' level is below the narrow range indication.
- SGs 'A' and 'C' are being controlled at approximately 25% using AFW.
- EPP-014, Faulted Steam Generator Isolation, has been performed for SG 'B'.

INITIATING CUES:

You are to classify this event and recommend any protective actions, if required.

PROTECTIVE ACTION RECOMMENDATION PROCESS

General Emergency Declared?
- No → **No PARs Required**
- Yes ↓

1.4 Substantial core damage is imminent or has occurred.
- No → **Evacuate 2 Mile Radius & 5 Miles Downwind. Shelter all other Subzones.**
- Yes ↓

2.4 A significant loss of reactor coolant is imminent or has occurred.
- No → **Evacuate 2 Mile Radius & 5 Miles Downwind. Shelter all other Subzones.**
- Yes ↓

3 Containment failure (Primary or S/G) is imminent or has occurred.
- No → **Evacuate 2 Mile Radius & 5 Miles Downwind. Shelter all other Subzones.**
- Yes → **Evacuate 5 Mile Radius & 10 Miles Downwind. Shelter all other Subzones.**

5 Mile Radius, 10 Miles Downwind

Wind Direction (From °)	Evacuate Subzones	Shelter Subzones
348º - 010º	A,B,C,D,H,I,K,L	E,F,G,J,M,N
011º - 034º	A,B,C,D,H,I,J,K,L	E,F,G,M,N
035º - 079º	A,B,C,D,I,J,K,L,M	E,F,G,H,N
080º - 101º	A,B,C,D,J,K,L,M	E,F,G,H,I,N
102º - 124º	A,B,C,D,J,K,L,M,N	E,F,G,H,I
125º - 146º	A,B,C,D,K,L,M,N	E,F,G,H,I,J
147º - 191º	A,B,C,D,E,K,L,M,N	F,G,H,I,J
192º - 214º	A,B,C,D,E,K,L,N	F,G,H,I,J,M
215º - 236º	A,B,C,D,E,F,K,L	G,H,I,J,M,N
237º - 281º	A,B,C,D,E,F,G,K,L	H,I,J,M,N
282º - 326º	A,B,C,D,F,G,H,K,L	E,I,J,M,N
327º - 347º	A,B,C,D,G,H,I,K,L	E,F,J,M,N

2 Mile Radius 5 Miles Downwind

Wind Direction (From °)	Evacuate Subzones	Shelter Subzones
327º - 010º	A,D,K	B,C,E,F,G,H,I,J,L,M,N
011º - 056º	A,K	B,C,D,E,F,G,H,I,J,L,M,N
057º - 124º	A,K,L	B,C,D,E,F,G,H,I,J,M,N
125º - 191º	A,B,L	C,D,E,F,G,H,I,J,K,M,N
192º - 214º	A,B	C,D,E,F,G,H,I,J,K,L,M,N
215º - 259º	A,B,C	D,E,F,G,H,I,J,K,L,M,N
260º - 281º	A,B,C,D	E,F,G,H,I,J,K,L,M,N
282º - 304º	A,C,D	B,E,F,G,H,I,J,K,L,M,N
305º - 326º	A,C,D,K	B,E,F,G,H,I,J,L,M,N

PROTECTIVE ACTION RECOMMENDATION PROCESS

1. Indications that substantial core damage is imminent or has occurred include:
   a) Core damage > 1% Melt.
   b) Core Exit Thermocouple readings ≥ 2300º F.
   c) Core uncovered > 30 minutes.
2. Indications that a significant loss of reactor coolant is imminent or has occurred include:
   a) Containment radiation reading > 10,000 R/Hr without spray or > 4,000 R/Hr with spray.
   b) Containment hydrogen gas concentration > 1%.
   c) Rapid vessel depressurization.
   d) A large break loss of coolant accident.
3. Indications that containment failure (primary or S/G) is imminent or has occurred include:
   a) A release of radioactivity can not be maintained below the General Emergency EAL criteria.
   b) Primary containment pressure can not be maintained below design basis pressure which is 45 psig.
   c) Primary containment H_2 gas concentration can not be maintained below combustible limits which is 4% by volume.
   d) Faulted/Ruptured S/G with a relief valve open.
4. Accidents which result in a direct release pathway to the environment (for example, a faulted and ruptured S/G with water level below the tube bundles and a relief valve open would provide such a pathway) will most likely be thyroid dose limiting. For circumstances involving this type of accident sequence:
   a) Consider **any** Fuel Breach sufficient to warrant the determination that substantial core damage has occurred.
   b) Consider **any** RCS Breach sufficient to warrant the determination that a significant loss of reactor coolant has occurred.

Containment monitors can provide indication of both core damage and RCS breach. Monitor values used to determine a specific amount of core damage are dependent on plant conditions, power history and time after shutdown. Monitor readings used to quantify an amount of damage or coolant leakage should be complimented by other indications and engineering judgment.

<u>If a release is in progress:</u>

- Perform dose assessment as soon as possible to determine if PAGs are exceeded and if additional Subzones require evacuation.
- Add any Subzones requiring evacuation as determined by dose assessment to the plant based PARs.

<u>If no release is in progress:</u>

- Perform dose projection on possible conditions as time permits to determine if PAGs could be exceeded.
- Consider adding any Subzones requiring evacuation as determined by dose projection to the plant based PARs.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM COM-B.1.a

Obtain a Grab Sample on the Plant Vent Stack

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Obtain a Grab Sample on the Plant Vent Stack

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 073A4.02 Importance: SRO 3.7 RO 3.7

K/A Statement: Ability to manually operate and / or monitor in the control room: Radiation monitoring system control panel

Task Standard: Grab sample has been obtained from the Plant Vent Stack WRGM and the system has been realigned.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: OP-118, Radiation Monitoring System

Validation Time: 10 minutes Time Critical: NO

Candidate: ______________________________

Time Start: __________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ____

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OP-118
Supervisory Key for RM-23

SIMULATOR OPERATOR INSTRUCTIONS: RESET TO ANY 100% POWER IC. PLACE SIMULATOR IN RUN.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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 plant is operating at 100% power.

Grab samples are required on the Plant Vent Stack.

INITIATING CUES:

You are to operate the Plant Vent Stack Remote Sampling Panel on RM-23 in accordance with OP-118 to allow grab samples to be taken.

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates current copy of OP-118, Section 8.2 NOTES: ***NOTE: Not all functions are modeled in simulator so CUES listed in JPM must be given.*** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Check to ensure the SKID CONT-REMOTE indicator is ON STANDARD: Verifies indicator is ON NOTES: ***CUE: Green light is lit.*** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Insert RM-23 key in the NORM/SUPV switch and turn to the SUPV position	**CRITICAL STEP**
STANDARD:	Inserts key and places in SUPV postion	
NOTES:	***CRITICAL TO ENABLE CHANGING FILTERS / RANGES TO ALLOW PROPER SELECTION FOR SAMPLE.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Reads ERFIS point RAV3509E	
STANDARD:	Reads ERFIS point and determines value to be 0.76E-06	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 5: Reads ERFIS point RAV3509F STANDARD: Reads ERFIS point and determines value to be 0.513E-03 NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 6: Reads ERFIS point RAV3509G STANDARD: Reads ERFIS point and determines value to be 0.544E-02 NOTES: ***NOTE: Due to both RAV3509E and RAV3509F being close to mid-scale, either may be selected. If RAV3509E is selected, perform JPM steps 7-10 and step 15. If RAV3509F is selected, perform JPM steps 11-15. Mark steps NOT performed as NA.*** COMMENTS:	____ SAT ____ UNSAT

STEP 7:	Select the ERFIS Point reading closest to the middle of its WRGM/ERFIS Range	**CRITICAL STEP**
STANDARD:	Compares ERFIS points to table and determines RAV3509E is closest to middle of range	
NOTES:	***CRITICAL TO ALLOW DETERMINATION OF PROPER FILTER / SETTINGS TO BE USED.***	____ SAT
COMMENTS:		____ UNSAT ____ NA
STEP 8:	Select WRGM Monitor, Filter and Timer based on the ERFIS Point closest to middle of WRGM/ERFIS Range.	**CRITICAL STEP**
STANDARD:	Selects WRGM Monitor LOW, Filter B, and Timer LOW RANGE	
NOTES:	***CRITICAL TO SELECT PROPER FILTER / SETTINGS FOR CORRECT SAMPLING.***	____ SAT
COMMENTS:		____ UNSAT ____ NA

STEP 9:	Adjust the dial on the front panel of the TIMER - LOW RANGE to the desired sample time	**CRITICAL STEP**
STANDARD:	Adjust the dial on the front panel of the TIMER-LOW RANGE to 25.0 (read in xx.x minutes).	
NOTES:	***CRITICAL TO SET TIMER PROPERLY TO ALLOW FOR REPRESENTATIVE SAMPLE.*** ***CUE: Timer indicates 25.0.***	____ SAT
COMMENTS:		____ UNSAT ____ NA
STEP 10:	Depress the appropriate START TIMER button	**CRITICAL STEP**
STANDARD:	Depresses the button associated with the timing mechanism marked TIMER- LOW RANGE	
NOTES:	***CRITICAL TO ALLOW START OF SAMPLING.*** ***CUE: TIMER - LOW RANGE is timing down and is now reading 0.00.*** ***NOTE: Mark JPM steps 11-14 as NA and continue with step 15.***	____ SAT
COMMENTS:		____ UNSAT ____ NA

STEP 11:	Select the ERFIS Point reading closest to the middle of its WRGM/ERFIS Range	**CRITICAL STEP**
STANDARD:	Compares ERFIS points to table and determines RAV3509F is closest to middle of range	
NOTES:	***CRITICAL TO ALLOW DETERMINATION OF PROPER FILTER / SETTINGS TO BE USED.***	____ SAT
COMMENTS:		____ UNSAT ____ NA
STEP 12:	Select WRGM Monitor, Filter and Timer based on the ERFIS Point closest to middle of WRGM/ERFIS Range.	**CRITICAL STEP**
STANDARD:	Selects WRGM Monitor MID, Filter C, and Timer MID/HIGH RANGE	
NOTES:	***CRITICAL TO SELECT PROPER FILTER / SETTINGS FOR CORRECT SAMPLING.***	____ SAT
COMMENTS:		____ UNSAT ____ NA

STEP 13:	Adjust the dial on the front panel of the TIMER - MID/HIGH RANGE to the desired sample time	**CRITICAL STEP**
STANDARD:	Adjust the dial on the front panel of the TIMER- MID/HIGH RANGE to 60.0 (read in xx.x seconds).	
NOTES:	***CRITICAL TO SET TIMER PROPERLY TO ALLOW FOR REPRESENTATIVE SAMPLE.*** ***CUE: Timer indicates 60.0.***	____ SAT
COMMENTS:		____ UNSAT ____ NA
STEP 14:	Depress the appropriate START TIMER button	**CRITICAL STEP**
STANDARD:	Depresses the button associated with the timing mechanism marked TIMER- MID/HIGH RANGE	
NOTES:	***CRITICAL TO ALLOW START OF SAMPLING.*** ***CUE: TIMER - MID/HIGH RANGE is timing down and is now reading 0.00.***	____ SAT
COMMENTS:		____ UNSAT ____ NA

STEP 15:	Return the RM-23 Panel to the original switch position per Attachment 2 to re-align for normal sampling	**CRITICAL STEP**
STANDARD:	Restores controls to the following configuration: - RM-23 NORM/SUPV Key NORM - TIMER - MID/HIGH RANGE - '00.0 SECONDS' - TIMER - LOW RANGE - '00.0 MINUTES' - FILTER A/B Selector - 'A' - FILTER C/D Selector - 'C' - POWER OFF/ON Switch - 'ON'	
NOTES:	***CRITICAL TO ALLOW NORMAL SAMPLING ALIGNMENT.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant is operating at 100% power.

Grab samples are required on the Plant Vent Stack.

INITIATING CUES:

You are to operate the Plant Vent Stack Remote Sampling Panel on RM-23 in accordance with OP-118 to allow grab samples to be taken.

8.2 Operation of Plant Vent Stack Remote Sampling Panel on RM-23

8.2.1 Initial Conditions

1. Grab samples are required on the Plant Vent Stack.

8.2.2 Procedural Steps

NOTE: There are two pairs of prefilters associated with each WRGM Sample Conditioning Skid. The upper level of the skid supports a set of two prefilters labeled A and B that filter flow for the low range/high flow (2.0 SCFM) detector. The lower level of the skid supports a set of two shielded prefilters labeled C and D that filter flow for the high range/low flow (0.06 SCFM) detector. Each skid also has two grab samplers (one for the high range flow path and one for the low range flow path) that are identical in construction to the prefilters. The grab samplers are not normally in service. They may be placed in service either locally or remotely for short (timed) duration collections of particulates and iodines.

1. Check to ensure the "SKID CONT.-REMOTE" indicator is ON.

2. Insert RM-23 key in the NORM/SUPV switch and turn to the SUPV position.

NOTE:
- The Chemistry Specialist, Radiation Control Director, Radiation Control Manager or the Dose Projection Team Leader can request a different prefilter to be placed in service during emergency conditions.
- The switch marked FILTER A/B selects between the two low range/high flow prefilters. The switch marked FILTER C/D selects between the two high range/low flow process prefilters.

3. Using the table below,
   - Read the ERFIS Points.
   - Select the ERFIS Point reading closest to the middle of its WRGM/ERFIS Range.
   - Select WRGM Monitor, Filter and Timer based on the ERFIS Point closest to middle of WRGM/ERFIS Range.

ERFIS Point	WRGM/ERFIS Range	WRGM Monitor To Be Used	FILTER Switch	TIMER
RAV3509E	1.0E-7μCi/cc to 1.0E-1μCi/cc	LOW	B	Low Range
RAV3509F	1.0E-4μCi/cc to 1.0E+2μCi/cc	MID	C	Mid/High Range
RAV3509G	1.0E-1μCi/cc to 1.0E+5μCi/cc	HIGH	D	Mid/High Range

8.2.2 Procedural Steps

4. If obtaining a sample for WRGM LOW Range Monitor, adjust the dial on the front panel of the TIMER - LOW RANGE to the desired sample time (read in xx.x minutes). Unless otherwise directed, the desired sample time is 25 minutes. To set the TIMER - LOW RANGE to 25 minutes, the dials should be set to 2, 5, and 0 (left to right).

5. If obtaining a sample for WRGM Mid/High Range Monitor, adjust the dial on the front panel of the TIMER - MID/HIGH RANGE to the desired sample time (read in xx.x seconds). Unless otherwise directed, the desired sample time is 60 seconds. To set the TIMER - MID/HIGH RANGE to 60 seconds, the dials should be set to 6, 0, and 0 (left to right).

NOTE: After depressing the "START TIMER" button the grab sampler will be automatically placed in line with the process stream flow path in place of the selected prefilter. When the timer has timed out, the previously selected prefilter will be placed back in line and the grab sampler will be ready for E&C Technicians to retrieve.

6. Depending on the selected process stream flow path from Step 8.2.2.03, depress the appropriate "START TIMER" button associated with either the timing mechanism marked "TIMER-MID/HIGH RANGE" or the one marked "TIMER-LOW RANGE."

7. When timer has timed out, return the RM-23 Panel to the original switch position per Attachment 2 to re-align for normal sampling. Complete an OMM-001 Attachment to verify switch positions.

Radiation Monitoring System Valve Lineup Checklist

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
	AEP-1			
1SP-916/918-SB	Cnmt Sample Isol	OPEN	______	______
1SP-16/939-SA	Cnmt Sample Isol Valves	OPEN	______	______

MCR RM-23 Panel

RADIATION MONITOR CONTROL AND DISPLAY UNIT 1 TRAIN A BAY 1

RC-21AV-3509-1-SA PLANT VENT STACK WRGM Remote Sample Control Panel

NOTE:
- These components should not be repositioned unless directed by HPs. Reference 2.4.0.01.
- Filters A & C are the designated trains for Tech Spec effluent accountability, filters B & D serve only as backups. Flow through filter A or B occurs when WRGM is in Low Range mode. Flow through filter C or D occurs when WRGM has auto shifted to Mid or High Range mode which occurs only during an accident.

COMPONENT NUMBER	COMPONENT DESCRIPTION	POSITION	CHECK	VERIFY
N/A	RM-23 NORM/SUPV Key Switch	NORM	______	______
N/A	TIMER - MID/HIGH RANGE	00.0 SECONDS	______	______
N/A	TIMER - LOW RANGE	00.0 MINUTES	______	______
N/A	FILTER A/B Selector Switch	A	______	______
N/A	FILTER C/D Selector Switch	C	______	______
N/A	POWER OFF/ON Switch	ON	______	______

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM COM-B.1.b

Perform RHR IST Valve Testing

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Perform RHR IST Valve Testing

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 005A4.01 Importance: SRO 3.4 RO 3.6

K/A Statement: Ability to manually operate and / or monitor in the control room: Controls and indications for RHR pumps

Task Standard: OST-1008, Section 7.2, has been completed for 1SI-340 and RHR Pump 1A-SA has been restored to operable status.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: OST-1008, 1A-SA RHR Pump Operability Quarterly Interval Modes 1-2-3

Validation Time: 10 minutes Time Critical: NO

Candidate: ______________________________

Time Start: ________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________________

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OST-1008, Section 7.2.
OST-1008, Attachment 4 and Attachment 6.
Stopwatch.

SIMULATOR OPERATOR INSTRUCTIONS: RESET TO ANY 100% POWER IC. PLACE SIMULATOR IN RUN.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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 plant is operating at 100% power.

OST-1008, 1A-SA RHR Pump Operability Quarterly Interval Modes 1-2-3, is being performed following maintenance for retest of 1SI-340, LOW HEAD SI TRAIN A TO COLD LEGS. A briefing has been conducted for the performance of this test.

INITIATING CUES:

You are to perform Section 7.2 of OST-1008 for 1SI-340 ONLY.

START TIME: ________

STEP 1:	Locates proper procedure and required information.	
STANDARD:	Locates OST-1008, Section 7.2, Attachment 4 and Attachment 6, and obtains calibrated stopwatch	
NOTES:		____ SAT
COMMENTS:		____ UNSAT
STEP 2:	Inform the Control Operator and Unit SCO that the 1A-SA RHR Pump will be made inoperable	
STANDARD:	Inform the Control Operator and Unit SCO	
NOTES:	***CUE: Control Operator and Unit SCO acknowledge information.***	____ SAT
COMMENTS:		____ UNSAT

STEP 3: Record time and date that 1A-SA RHR Pump was made inoperable STANDARD: Records current time and date on Attachment 6 NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 4: Verify 1SI-340 is in its pretest position STANDARD: Verifies 1SI-340 is OPEN by position indication and initial on Attachment 4 NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 5:	Provides control power for 1SI-340, LOW HEAD SI TRAIN A TO COLD LEG	**CRITICAL STEP**
STANDARD:	Places Control Power switch for 1SI-340 in ON position and verifies power available by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE POWER TO VALVE OPERATOR.***	____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Perform full stroke close test of 1SI-340	**CRITICAL STEP**
STANDARD:	Simultaneously starts the stopwatch and place the control switch for 1SI-340 to the CLOSED position	
NOTES:	***CRITICAL TO START STOPWATCH WHEN VALVE STROKED TO PROVIDE PROPER TIMING.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Stop timing of valve stroke when 1SI-340 is fully closed	**CRITICAL STEP**
STANDARD:	Stops the stopwatch when 1SI-340 is fully closed and records the time on Attachment 4	
NOTES:	***CRITICAL TO ALLOW COMPARISON TO ACCEPTANCE CRITERIA.***	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	Perform full stroke open test of 1SI-340	**CRITICAL STEP**
STANDARD:	Simultaneously starts the stopwatch and place the control switch for 1SI-340 to the OPEN position	
NOTES:	***CRITICAL TO START STOPWATCH WHEN VALVE STROKED TO PROVIDE PROPER TIMING.***	____ SAT
COMMENTS:		____ UNSAT

STEP 9:	Stop timing of valve stroke when 1SI-340 is fully open	**CRITICAL STEP**
STANDARD:	Stops the stopwatch when 1SI-340 is fully open and records the time on Attachment 4	
NOTES:	***CRITICAL TO ALLOW COMPARISON TO ACCEPTANCE CRITERIA.***	____ SAT
COMMENTS:		____ UNSAT
STEP 10:	Verify 1SI-340 travel by indicating lights and in required post-test position	
STANDARD:	Verifies 1SI-340 is full open and initial the Post-Test and Full Stroke Test Verification of Travel entries on Attachment 4	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 11: Independently verify 1SI-340 is in its post-test position STANDARD: Independent Verifier verifies 1SI-340 is open and initials the Post-Test Verifier block on Attachment 4 NOTES: ***CUE: Inform candidate for purposes of this JPM ONLY, independent verifications are being waived.*** COMMENTS:	____ SAT ____ UNSAT
STEP 12: Removes control power from 1SI-340, LOW HEAD SI TRAIN A TO COLD LEG STANDARD: Places Control Power switch for 1SI-340 in OFF position and verifies power removed by position indicating lights NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 13: Sign off completed steps in procedure STANDARD: Signs off Steps 7.2.4 through 7.2.12 when testing of 1SI-340 is complete NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 14: Inform the Control Operator and Unit SCO that the 1A-SA RHR Pump will be made operable STANDARD: Inform the Control Operator and Unit SCO NOTES: ***CUE: Control Operator and Unit SCO acknowledge information.*** COMMENTS:	____ SAT ____ UNSAT

STEP 15: Record time and date that 1A-SA RHR Pump was made operable STANDARD: Records current time and date on Attachment 6 NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 16: Reviews data and compares to Acceptance Criteria STANDARD: Compares data on Attachment 4 to Acceptance Criteria NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 17:	Informs Unit SCO of results	
STANDARD:	Informs Unit SCO of results of test	
NOTES:	***CUE: Unit SCO acknowledges information.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant is operating at 100% power.

OST-1008, 1A-SA RHR Pump Operability Quarterly Interval Modes 1-2-3, is being performed following maintenance for retest of 1SI-340, LOW HEAD SI TRAIN A TO COLD LEGS. A briefing has been conducted for the performance of this test.

INITIATING CUES:

You are to perform Section 7.2 of OST-1008 for 1SI-340 ONLY.

C
CONTINUOUS USE

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 9

PROCEDURE TYPE: Operations Surveillance Test

NUMBER: OST-1008

TITLE: 1A-SA RHR Pump Operability
Quarterly Interval
Modes 1-2-3

NOTE: This procedure has been screened per PLP-100 criteria and determined to be a CASE III procedure. No additional management involvement is required.

1.0 PURPOSE

To verify the operability of the 1A-SA RHR System. Tech Spec 4.5.2.f.2 for A Train is satisfied by running 1A-SA RHR Pump on recirculation and establishing a required differential pressure while checking developed flow. This test is to be performed during Modes 1, 2, and 3 only. Performance of OST-1108 satisfies the 1A-SA RHR Pump requirements of Tech Spec 3.5.2 prior to entry into Mode 3.

Tech Spec 4.0.5 and 4.6.3.1 are satisfied for the pumps and associated valves as listed on Attachments 2,3, and 4 during the pump run and valve test portions of this test. Check valves 1RH-34 and 1SI-320 Stroke Open, and 1RH-70 Stroke Closed tests are also performed as listed on Attachment 2.

This test obtains response time data if necessary for the satisfactory completion of EST-301, that partially satisfies Tech Spec 4.3.2.2 as stated in PLP-106 Attachment 2 Items 2.a, 3.a and 4.a.

2.0 REFERENCES

2.1 Plant Operating Manual Procedures

1. AP-535
2. OP-110
3. OP-111
4. OST-1107
5. OST-1108
6. OST-1814
7. SD-111
8. ISI-111
9. ISI-800
10. ISI-801

2.2 Technical Specifications

1. 4.0.5
2. 4.5.2.f.2
3. 4.6.3.1

2.3 Final Safety Analysis Report

1. TMI-Appendix
2. 6.3.2
3. 6.3.4
4. 7.3.2

2.4 Drawings

1. 5-S-1310, 1320, 1324

2. 6-B-401 0331, 0332, 0333

3. 1364-010929 S06, S19, S22, S23, S32, S33, & S34

2.5 Technical Manuals

1. VM-BJH-VO4, Pumps, Residual Heat Removal

2.6 Corrective Action Program (CAP) Items

1. 90H0034

2. 92H0614

2.7 Others

1. HNP-IST-002, HNP IST Program Plan - 2nd Interval

2. LER 96-010

3.0 PREREQUISITES

1. Review the Main Control Room Status File and verify that the system is aligned in a manner that will support the performance of this test. ________

2. Coordinate the performance of this OST with other plant evolutions such that the minimum equipment operating requirements of Tech Specs are met. ________

3. Verify instrumentation needed for the performance of this test is free of deficiencies that affect instrument indication. ________

NOTE: ERFIS computer points PRH5450A, RHR PMP A DIFF PRESS and FRH0605A, HX A HDR FLOW will indicate "NCAL" as the quality code until the pump is running.

4. Check that the ERFIS points used in Attachment 2 reflect present plant conditions with satisfactory quality codes. ________

5. Obtain any tools and equipment required per Section 5.0. ________

6. Complete the Calibration Data Sheet and verify instrumentation is within calibration. ________

7. Verify Maintenance support is available for the following:

   - The installation of jumpers in PIC Cab 5 and 7.
   - The installation of the test gauge.

   ____

8. Plant is in Mode 1, 2, or 3. ________

9. RCS Temperature is greater than or equal to 400°F. ________

10. If a leak test for RHR Trains A&B to SI TMI III D.1.1 is due per OST-1814 (as determined by the On-line schedule as being due) or if a leak test for RHR Train A Recirculation Header Vent Valves is due per OST-1814 (as determined by the On-line schedule as being due), a qualified VT-2 Level II Examiner is available to perform inspection. Additional VT-2 Level II Examiners can be used to minimize Inop/Run times. If OST-1814 tasks are not due, N/A this step. ________

11. Personnel taking vibration data must be qualified per Reference 2.1.0.08. ________

12. Verify all prerequisites are met, then obtain Unit SCO permission to perform this OST.

________________________ ________
Signature Date

4.0 PRECAUTIONS AND LIMITATIONS

1. If a Safety Injection signal is received, during the performance of this procedure, terminate this test and return the RHR system to an operable status.

2. Do not operate an RHR Pump at shutoff head of 190 psig for longer than 80 minutes.

3. Failure to follow the radiological controls of AP-535 could result in personnel and equipment contamination.

4. During the period that 1SI-331 is not SHUT, an operator **must** remain at the valve and be in direct communication with the control room.

5. Do not exceed the following RHR Pump starting duty:

   - Two pump starts from ambient temperature are allowed
   - One start from operating temperature is allowed
   - For additional starts, allow 15 minutes run time or 45 minutes idle time between starts.

6. If any valve stroke time falls outside its Code Criteria, the valve will be immediately retested per the retest instructions or declared inoperable.

5.0 TOOLS AND EQUIPMENT

1. Calibrated Vibrometer
2. Calibrated Stopwatches (2)
3. Pressure Gauge (1) - Ashcroft pressure gauge or equivalent with a range of 0-60 PSIG and an accuracy of ±2% of full scale or better
4. Switched jumper
5. Locked Valve key

6.0 ACCEPTANCE CRITERIA

1. This test will be completed satisfactorily if all the data taken on Attachments 2, 3 and 4 is within the stated acceptance criteria.

7.0 PROCEDURE

NOTE: • Use of computer points is preferred over process indicators, where available.

• The next two steps should be signed off at the completion of test.

1. If, during the performance of this test, a valve stroke time exceeds its Code Criteria, immediately retest the valve per Attachment 5. (Otherwise step is N/A) ________

2. If, during the performance of this test, a valve exhibits abnormal or erratic action, document the condition in the comments section of Attachment 6.(Otherwise step is N/A) ________

7.1 1A-SA RHR Pump Test

1. Obtain calibrated stopwatches needed for this test. ________

2. Perform pre-start checks on 1A-SA RHR Pump per OP-111. ________

3. Direct Maintenance to install suction pressure test gauge (0-60 PSIG Ashcroft) at Instrument Rack A1-R31-ESF-A on the test connection at 1RH-8-DV1, Instrument Valve for PI-601A. ________

4. Record 1A-SA RHR Pump idle suction pressure as read on the test gauge at PI-601A on Attachment 2. ________

5. SHUT 1SI-327, LOW HEAD SI TRAIN B TO HOT LEG CROSSOVER. ________

6. Verify 1SI-340 and 1RH-31 are in their pretest position and initial on Attachment 4. ________

7. Place the LOW HEAD SI TRAIN A TO COLD LEG CONT PWR & VLV POS (Control Power for 1SI-340) switch to ON. ________

8. Inform the Control Operator and Unit SCO that the 1A-SA RHR Pump will be made inoperable. ________

NOTE: Performance of the following Step initiates an LCO for 1A-SA RHR Pump.

9. Simultaneously start the stopwatch and momentarily place the control switch for 1SI-340, LOW HEAD SI TRAIN A TO COLD LEG to SHUT. ________

10. Stop the stopwatch when 1SI-340 reaches the SHUT position and record the time on Attachment 4. ________

11. Record time and date that 1A-SA RHR Pump was made inoperable on Attachment 6. ________

7.1 1A-SA RHR Pump Test (continued)

NOTE: The stroking of 1RH-31, RHR PUMP 1A-SA MINI FLOW will require additional personnel to operate stopwatches, one person needed to time the valve in the SHUT direction and another standing by to immediately time the valve in the OPEN direction due to the valve automatically opening once the valve is fully SHUT.

12. Stroke time 1RH-31, RHR PUMP 1A-SA MINI FLOW VALVE in the SHUT direction and record time on Attachment 4. ________

13. Stroke time 1RH-31, RHR PUMP 1A-SA MINI FLOW VALVE in the OPEN direction and record time on Attachment 4. ________

14. Verify OPEN 1RH-31 SA, RHR PUMP A-SA MINI FLOW. ________

15. Start RHR PUMP 1A-SA. ________

NOTE: During the period that 1SI-331 is not SHUT, an operator must remain at the valve and be in direct communications with the control room.

16. Align the RHR System to Recirc to the RWST by performing the following:

    a. Unlock and OPEN 1SI-448, Lo Head SI Recirc to RWST Root Isol Vlv. ________

    b. Unlock and OPEN 1SI-331, Lo Head SI Recirc to RWST Isol Vlv, 10 turns from SHUT. This throttled position will prevent pump run-out during a loss of instrument air. ________

17. Verify SHUT 1RH-31 SA, RHR PUMP 1A-SA MINI FLOW. ________

NOTE: The pump differential pressure established in the following Step should be as close to 101 psid as possible to meet IST acceptance criteria.

18. Perform the following to establish an RHR Pump differential pressure of 100 to 102 psid as indicated on ERFIS Computer Point PRH5450A or PDI-5450A (RHR PUMP A DIFF PRESS):

    a. If the differential pressure is less than 100 psid, throttle SHUT HC-603A1, RHR HEAT XCHG A OUT FLOW CONT 1RH-30, to establish a differential pressure of 100 to 102 psid, otherwise N/A this Step. ________

    b. If the differential pressure is greater than 102 psid, throttle OPEN 1SI-331 to establish a differential pressure of 100 to 102 psid, otherwise N/A this Step. ________

7.1 <u>1A-SA RHR Pump Test</u> (continued)

19. If OST-1814 is due (as indicated by the On-line schedule as being due), start leak inspection at this time and continue with the performance of this test. Otherwise, N/A this step. ______

20. Allow pump to run for at least 2 minutes after conditions are as stable as the system permits before recording data. ______

21. Record Residual HX 1A Outlet Temp (TRH0606A) on Attachment 2. ______

<u>NOTE</u>: Flow within the acceptance criteria through FE-605A also verifies Satisfactory Stroke OPEN Criteria for Check Valves 1RH-34 and 1SI-320.

22. Record RHR Loop A Flow (FRH0605A or FI-605A1, HX A HDR FLOW) on Attachment 2. ______

23. Calculate and record temperature corrected flow as directed per Note 5, on Attachment 2. ______

______
Verified

24. Record 1A-SA Pump operating suction press from test gauge at PI-601A, on Attachment 2. ______

25. Isolate test gauge by shutting 1RH-8-DV1, Instrument Valve. ______

26. Record 1A-SA RHR Pump differential pressure as indicated on PRH5450A or PDI-5450A on Attachment 2. ______

<u>NOTE</u>:
- The IST Program requires <u>all</u> readings to be taken in units of velocity (inches/second).
- To ensure consistent readings are being recorded the vibration data recorded on Attachment 3 should be the values which the qualified operator stored for each point in the Vibrometer.

27. Measure vibration and complete Attachment 3 using the values that were stored in the vibrometer. ______

7.1 <u>1A-SA RHR Pump Test</u> (continued)

28. If Response Time Testing of 1A-SA RHR Pump is required (as indicated by the On-line schedule as being due), perform the following substeps: (Otherwise mark this step N/A)

    a. Stop 1A-SA RHR Pump. ________

    b. Station an Operator in the Main Control Room with a stopwatch to measure the time from closure of 1A-SA RHR Pump Breaker until the flow rate reads greater than or equal to 3905 gpm on FI-605A1. ________

    c. Simultaneously start 1A-SA RHR Pump and the stopwatch. ________

    d. Stop the stopwatch when flow, as indicated on FI-605A1, reads greater than or equal to 3905 gpm. ________

    e. Record the time measured in Step 7.1.0.028.d on Attachment 2. ________

    f. Forward a copy of Attachment 2 to the Responsible Engineer (Response Time) for the completion of EST-301. ________

CAUTION

If 1RH-31, RHR PUMP A-SA MINI FLOW valve fails to OPEN when the following Step is performed, the RHR Pump 1A-SA will be in a dead-headed condition. This condition could damage the pump.

---

29. Shut 1SI-331, Lo Head SI Recirc to RWST Isol Vlv ________

30. Verify OPEN 1RH-31 SA, RHR PUMP 1A-SA MINI FLOW. ________

31. Record RHR Pump B Disch Press as indicated on PRH0600B or PI-600B, RHR PUMP B DISCH PRESS, on Attachment 2. ________

7.1 <u>1A-SA RHR Pump Test</u> (continued)

32. At Instrument Rack A1-R31-ESF-A (216 RAB), record, 1A-SA RHR Pump flow from FIS-01RH-0602ASAW on Attachment 2. ________

33. OPEN 1SI-327 SB, LOW HEAD SI TRAIN B TO HOT LEG CROSSOVER. ________

________ Verified

34. Record Pump 1B-SB discharge pressure as indicated on PRH0600B or PI-600B on Attachment 2. ________

35. Record 1A-SA RHR Pump flow from FIS-01RH-0602ASAW on Attachment 2. ________

36. If OST-1814 RHR Trains A&B to SI TMI III D.1.1 Leak Test is being performed, hold at this step until leak test is completed. Otherwise, N/A this step. ________

37. Stop RHR PUMP 1A-SA. ________

38. Perform the following to reduce residual pressure in the RHR Pump discharge line:

    a. Open 1SI-331, until indicated pressure on PI-600A has decreased to the normal value of approx. 50 to 60 psig. ________

39. Perform the following to secure the RWST Recirc lineup:

    a. SHUT and lock 1SI-331. ________

    ________ Verified

    b. SHUT and lock 1SI-448. ________

    ________ Verified

40. Simultaneously start the stopwatch and momentarily place the control switch for 1SI-340 to OPEN. ________

41. Stop the stopwatch when 1SI-340 reaches the OPEN position and record the time on Attachment 4. ________

7.1 1A-SA RHR Pump Test (continued)

42. Place 1SI-340 to OPEN/PULL TO LOCK. ________

43. Verify OPEN 1RH-30, RHR HEAT XCHG A OUT FLOW CONT. This step can be N/A if 1RH-30 was not throttled in Step 7.1.0.018.a as indicated by Step 7.1.0.018.a being N/A. ________

____
Verifier

44. Place the LOW HEAD SI TRAIN A TO COLD LEG CONT PWR & VLV POS (Control Power for 1SI-340) switch to OFF. ________

45. Verify 1SI-340 and 1RH-31 are in their Post-Test position and initial the Post-Test and Full Stroke Test Verification of Travel entries on Attachment 4. ________

NOTE: The following step will restore 1A-SA RHR Pump to an operable status.

46. Independently verify 1SI-340 and 1RH-31 are in their Post-Test position and initial the Post-Test Verifier block on Attachment 4. ________

47. Record the time and date that 1A-SA RHR Pump is operable on Attachment 6. ________

48. Inform the Control Operator and Unit SCO that 1A-SA RHR Pump is operable. ________

NOTE: If the Acceptance Criteria in the next two steps is met for Pressure and Flow, it will also satisfy the Stroke CLOSED Criteria for 1RH-70.

49. Calculate and record the 1B-SB RHR Pump discharge pressure increase per Note 2 on Attachment 2. ________

____
Verified

50. Calculate and record the 1A-SA RHR Pump flow increase per Note 3 on Attachment 2. ________

____
Verified

51. Direct Maintenance to remove the 0 to 60 PSIG Ashcroft test gauge from the test connection at 1RH-8-DV1, Instrument Valve for PI-601A located at Instrument Rack A1-R31-ESF-A and install plug. ________

____
Verified

7.2 IST Valve Test

NOTE:
- Steps 7.2.0.04 through 7.2.0.012 are to be signed off when testing of the first seven valves listed on Attachment 4 (1SI-340 thru 1SI-326) has been completed.
- Valve position will be verified by indicating lights.

1. Obtain a calibrated stopwatch for use in the tests. ________
2. Inform the Control Operator and Unit SCO that the 1A-SA RHR Pump will be made inoperable. ________

NOTE: Performance of the following Step initiates an LCO for 1A-SA RHR Pump. Placing the valve being tested to its post-test position restores the system to an operable status.

3. Record time and date that 1A-SA RHR Pump was made inoperable on Attachment 6. ________

CAUTION

R The impact of stroking the following valves should be analyzed to ensure that no flow path would be established that would allow gravity flow of RWST water to the RCS or Containment Sump, or unwanted flow between systems. (Reference 2.6.0.01)

---

4. Verify the valve to be tested is in its pretest position and initial on Attachment 4. ________
5. Prior to stroking 1RH-25, perform the following substeps to prevent undesired flow to CSIP suction:
(Step is N/A when not stroking 1RH-25)
   a. Verify VCT pressure is greater than or equal to 20 psig as indicated on PI-117.1. ________
   b. Verify that RHR Pump A discharge pressure has decreased to the normal value of 50 to 60 psig as indicated on PI-600A. ________

NOTE: 1SI-300, 1SI-322, 1SI-326, and 1SI-340 need to be timed in both directions of travel.

6. Simultaneously start the stopwatch and place the control switch, for the valve to be tested, to the position opposite its pretest position. ________
7. Stop the stopwatch when the valve reaches its required position and record the time on Attachment 4. ________

7.2 IST Valve Test

8. If 1SI-310 SA, CONTAINMENT SUMP TO RHR PUMP A-SA, has been stroked OPEN **and** OST-1814 RHR Train A Recirculation Header Vent Valves TMI III D.1.1 Leak Test is due (as indicated by Task O S RM 093 being due), perform the following steps. Otherwise, N/A these steps.

    a. Perform OST-1814 RHR Train A Recirculation Header Vent Valves TMI III D.1.1 Leak Test. Hold at this step until leak test is completed. ________

    b. When OST-1814 RHR Train A Recirculation Header Vent Valves TMI III D.1.1 Leak Test is completed, continue with Step 7.2.0.09. ________

9. Place the control switch, for the valve being tested, to its Post-Test position. Simultaneously start the stopwatch if timing is required. ________

10. If timing, stop the stopwatch when the valve reaches its Post-Test position and record the time on Attachment 4. ________

11. Verify the valve has gone to its Post-Test position and initial the Post-Test and Full Stroke Test Verification of Travel entries on Attachment 4. ________

12. Independently verify the valve being tested is in its post-test position and initial the Post-Test Verifier block on Attachment 4. ________

13. Observe caution prior to Step 7.2.0.04 and repeat Steps 7.2.0.04 through 7.2.0.012 until the first seven valves listed on Attachment 4 (1SI-340 thru 1SI-326) are tested. ________

NOTE: The following step will restore A Train RHR to an operable status.

14. Record time and date that 1A-SA RHR Pump is operable on Attachment 6. ________

15. Inform the Control Operator and Unit SCO that 1A-SA RHR Pump is operable. ________

7.3 <u>1RH-20 and 1RH-30 Valve Testing</u>

1. Verify OPEN HC-603A1, RHR HEAT XCHG A OUT FLOW CONT 1RH-30. ________

2. Inform the Control Operator and Unit SCO that the 1A-SA RHR Pump will be made inoperable. ________

<u>NOTE</u>: Performance of the following Step initiates an LCO for 1A-SA RHR Pump. Removing the jumpers and placing the valve being tested to its post-test position restores the system to an operable status.

3. Record time and date that 1A-SA RHR Pump was made inoperable on Attachment 6. ________

<u>NOTE</u>: Concurrent Verification is the preferred method when installing jumpers and lifting leads.

4. Direct Maintenance to perform the following:

   a. In PIC Cab 5 lift Black lead 10331G off of terminal 22 on TB-A.

      Lead lifted ________

   b. With the switch closed, install a switched jumper in PIC Cab 5, between terminal 22 and black lead 10331G.

      Installed ________

<u>NOTE</u>: Valve position shall be verified by stem position.

5. Station an Operator with a stopwatch at 1RH-30 and establish communications between the Operator, Maintenance at PIC Cab 5, and the Control Room. ________

6. Verify 1RH-30 in its pretest position and initial on Attachment 4. ________

7. Press the DECREASE push button for HC-603A1 (1RH-30) and verify that the valve is SHUT. ________

8. Simultaneously have the Operator at 1RH-30 start the stopwatch and have Maintenance at PIC Cab 5 OPEN the installed switch for 1RH-30. ________

9. Stop the stopwatch when 1RH-30 reaches the OPEN position and record time on Attachment 4. ________

10. Verify that 1RH-30 goes to the OPEN position and initial the Fail-Safe Test Position Verified block on Attachment 4. ________

11. Adjust HC-603A1 (1RH-30) until it reaches 100% demand. ________

7.3 1RH-20 and 1RH-30 Valve Testing

12. Direct Maintenance to perform the following:

    a. Remove the switched jumper in PIC Cab 5, from between terminal 22 and black lead 10331G.

    Removed ________

    ____
    Verifier

    b. In PIC Cab 5 land Black lead 10331G on terminal 22 on TB-A.

    Landed ________

    ____
    Verifier

13. Cycle 1RH-30 SHUT then OPEN and initial the Full Stroke Test Verification of Travel on Attachment 4. ________

14. Initial for the Post-Test position on Attachment 4. ________

15. Independently verify 1RH-30 is OPEN and initial the Post-Test Verifier entry on Attachment 4. ________

16. Verify SHUT FK-605A1, RHR HEAT XCHG A BYP FLOW CONT 1RH-20. ________

NOTE: Concurrent Verification is the preferred method when installing jumpers and lifting leads.

17. Direct Maintenance to perform the following:

    a. In PIC Cab 7 lift black lead 10333B off of terminal 19 on TB-G.

    Lifted ________

    b. With the switch closed, install a switched jumper in PIC Cab 7, between terminal 19 and black lead 10333B.

    Installed ________

NOTE: Valve position shall be verified by stem position.

18. Station an Operator with a stopwatch at 1RH-20 and establish communications between the Operator, Maintenance at PIC Cab 7, and the Control Room. ________

19. Verify 1RH-20 in its pretest position and initial on Attachment 4. ________

20. Adjust FK-605A1 (1RH-20) and verify that the valve is OPEN. ________

7.3 1RH-20 and 1RH-30 Valve Testing (continued)

21. Simultaneously have the Operator at 1RH-20 start the stopwatch and have Maintenance at PIC Cab 7 OPEN the installed switch for 1RH-20. ________

22. Stop the stopwatch when 1RH-20 reaches the SHUT position and record time on Attachment 4. ________

23. Verify that 1RH-20 goes to the SHUT position and initial the Fail-Safe Test Position Verified on Attachment 4. ________

24. Adjust FK-605A1 (1RH-20) until it reaches 0% demand. ________

NOTE: The following step will restore A Train RHR to an operable status.

25. Direct Maintenance to perform the following:

    a. Remove the switched jumper in PIC Cab 7, from between terminal 19 and black lead 10333B.

    Removed ________

    ____
    Verifier

    b. In PIC Cab 7 land black lead 10333B on terminal 19 on TB-G.

    Landed ________

    ____
    Verifier

26. Cycle 1RH-20 OPEN then SHUT and initial the Full Stroke Test Verification of Travel on Attachment 4. ________

27. Initial for the Post-Test position on Attachment 4. ________

28. Independently verify 1RH-20 is SHUT and initial the Post-Test Verifier entry on Attachment 4. ________

29. Inform the Control Operator and Unit SCO that 1A-SA RHR Pump is operable. ________

30. Record time and date that 1A-SA RHR Pump is operable on Attachment 6. ________

7.4 Test Completion

1. Verify all data taken on Attachments 2, 3 and 4 is within its stated acceptance criteria. ________

2. Complete the applicable portions of Attachment 6. ________

8.0 DIAGRAMS/ATTACHMENTS

Attachment 1 - Calibration Data

Attachment 2 - Performance Data

Attachment 3 - Vibration Data

Attachment 4 - Valve Test Data

Attachment 5 - Valve Retest Data Sheet

Attachment 6 - Certifications and Reviews

Calibration Data

INST/MODEL DESCRIPTION	INST ID NO.	CAL DUE DATE
Calibrated Vibrometer		
Calibrated Stopwatch		
Calibrated Stopwatch		
0 to 60 PSIG ASHCROFT (OR EQUIVALENT)		

Performance Data

Section 7.1 1A-SA RHR Pump

NOTE 1: ERFIS Computer point PRH5450A, RHR PMP A DIFF PRESS, will indicate "NCAL" as the quality code until the pump is running.

NOTE 2: Calculate Disch. Pressure Increase as follows:

______________	-	______________	=	______________
Step 7.1.0.034		Step 7.1.0.031		Step 7.1.0.049 Disch Press Inc.

NOTE 3: Calculate Flow Increase as follows:

______________	-	______________	=	______________
Step 7.1.0.035		Step 7.1.0.032		Step 7.1.0.050 Flow Increase

NOTE 4: If the Acceptance Criteria is met for flow and pressure, the "stroke closed" test of check valve 1RH-70 has been verified.

NOTE 5: RHR pump flow must be temperature corrected per the following equation prior to evaluating pump performance against the established acceptance criteria:

$Q_{ind} \times [(4.72E{-}7 \times T^2) + (1.38E{-}5 \times T) + 0.937] = Q_{corr}$

Where:
- Q_{corr} = Corrected or Actual Flow Rate
- Q_{ind} = Indicated Flow Rate
- T = Fluid Temperature

(4.72E-7) x (______________ Step 7.1.0.021) x (______________ Step 7.1.0.021) = ________ A

[(1.38E-5) x (______________ Step 7.1.0.021)] + 0.937 = ________ B

______________ Step 7.1.0.022 X (________ A + ________ B) = ________ Q_{corr}

NOTE 6: 100 psid and 3663 gpm are per T.S. 3/4.5.2.f.2

Performance Data

Section 7.1 1A-SA RHR Pump

INSTRUCTIONS

1. If pump hydraulic data does not meet acceptance criteria:
   a. Declare the pump INOPERABLE.
   b. Initiate a CR.

STEP NO.	PARAMETER	INSTRUMENT	READING	ACCEPTANCE CRITERIA
7.1.0.04	IDLE SUCTION PRESSURE	TEST GAUGE at PI-601A		≥ 10 psig
7.1.0.021	RESIDUAL HX 1A OUTLET TEMP	TRH0606A		N/A
7.1.0.022	RHR LOOP A FLOW	FRH0605A or FI-605A1		N/A
7.1.0.023	Temperature Corrected 1A-SA RHR PUMP FLOW	Q_{corr} NOTE 5		3663 to 4303.2 GPM NOTE 6
7.1.0.023	Check Valve 1RH-34 Stroke OPEN	FRH0605A or FI-605A1	SAT/UNSAT	≥ 3663 GPM
7.1.0.023	Check Valve 1SI-320 Stroke OPEN	FRH0605A or FI-605A1	SAT/UNSAT	≥ 3663 GPM
7.1.0.024	OPER SUCTION PRESSURE	TEST GAUGE at PI-601A		≥ 10 PSIG
7.1.0.026	RHR PUMP A DIFF PRESS	PRH5450A or PDI-5450A NOTE 1		100 to 102 PSID NOTE 6
7.1.0.028.e	Time to reach required flow	Stopwatch		N/A
7.1.0.031	RHR PUMP B DISCH PRESS	PRH0600B or PI-600B		N/A
7.1.0.032	1A-SA RHR PUMP FLOW	FIS-01RH-0602A SAW		N/A
7.1.0.034	RHR PUMP B DISCH PRESS	PRH0600B or PI-600B		N/A
7.1.0.035	1A-SA RHR PUMP FLOW	FIS-01RH-0602A SAW		N/A
7.1.0.049	1B-SB RHR PUMP DISCH PRESS INCREASE	NOTE 2		< 33 PSIG NOTE 4
7.1.0.050	1A-SA RHR PUMP FLOW INCREASE	NOTE 3		≤ 50 GPM NOTE 4
7.1.0.050	Check Valve 1RH-70 Stroke Closed	NOTE 2,3	SAT/UNSAT	NOTE 4

Vibration Data for RHR Pump 1A-SA

INSTRUCTIONS:

1. If pump vibration data is greater than the Acceptable Range but within the Alert Range:
   a. Prepare an E-mail or Memo to the Surveillance Testing Scheduling Coordinator directing the test frequency of the pump to be doubled.
   b. Attach a copy of the E-mail or Memo to the test package.

2. If pump vibration data meets the Required Action Criteria:
   a. Declare the pump INOPERABLE.
   b. Initiate a Condition Report (CR).

Step 7.1.0.027

RHR Pump 1A-SA	IN/SEC	ACCEPTANCE CRITERIA		
		Acceptable Range	Alert Range	Required Action
Axial		≤0.0575	>0.0575 to ≤0.138	>0.138
Top Parallel		≤0.325	>0.325 to ≤0.70	>0.70
Top Perpendicular		≤0.325	>0.325 to ≤0.70	>0.70
Bottom Parallel		≤0.1725	>0.1725 to ≤.414	>0.414
Bottom Perpendicular		≤0.13	>0.13 to ≤0.312	>0.312

Attachment 4
Sheet 1 of 2

Valve Testing

NOTE : All spaces next to valve number shall be filled in with an appropriate entry ; initials, data, or N/A as applicable.

PRETEST ALIGNMENT			FULL STROKE TEST				FAIL SAFE TEST		POSTTEST ALIGNMENT			ACCEPTANCE CRITERIA (SEC)					
			Verification of Travel by Ind Lights (INIT)		Stroke Time (SEC)							CODE CRITERIA				LIMITING VALUE	
												OPEN		SHUT			
Valve Number	Pretest Position	Init	Stem	Ind Lights	OPEN	SHUT	Fail Safe Position	Position Verified	Posttest Position	Pos Init	Verf Init	Low	High	Low	High	OPEN	SHUT
1SI-340	OPEN		N/A				N/A	N/A	OPEN Pull to Lock & Control Pwr OFF			9.82	13.28	9.29	12.55	17.32	16.38
1RH-31	OPEN		N/A				N/A	N/A	OPEN			6.54	10.90	5.40	9.00	15.26	12.60
1RH-25	SHUT		N/A			N/A	N/A	N/A	SHUT			17.20	23.28	N/A	N/A	30.36	N/A
1SI-300	SHUT		N/A				N/A	N/A	SHUT			10.77	14.57	10.22	13.82	15.00	15.00

Comments: ____

Valve Testing

NOTE: All spaces next to valve number shall be filled in with an appropriate entry; initials, data, or N/A as applicable.

PRETEST ALIGNMENT			FULL STROKE TEST				FAIL SAFE TEST		POSTTEST ALIGNMENT			ACCEPTANCE CRITERIA (SEC)					
			Verification of Travel by Ind Lights (INIT)		Stroke Time (SEC)							CODE CRITERIA				LIMITING VALUE	
												OPEN		SHUT			
Valve Number	Pretest Position	Init	Stem	Ind Lights	OPEN	SHUT	Fail Safe Position	Position Verified	Posttest Position	Pos Init	Verf Init	Low	High	Low	High	OPEN	SHUT
1SI-310	SHUT		N/A			N/A	N/A	N/A	SHUT			10.77	14.55	N/A	N/A	15.00	N/A
1SI-322	OPEN		N/A				N/A	N/A	OPEN			10.48	14.16	10.26	13.86	18.48	18.09
1SI-326	OPEN		N/A				N/A	N/A	OPEN			7.43	12.37	7.36	12.26	16.32	16.16
1RH-30	OPEN			N/A		N/A	OPEN		OPEN			7.65	12.75	N/A	N/A	20.40	N/A
1RH-20	SHUT			N/A	N/A		SHUT		SHUT			N/A	N/A	2.04	6.12	N/A	10.20

Comments: ____

Valve Retest Data Sheet

NOTE: This entire Attachment is N/A if no valve is retested due to exceeding the Code Criteria.

Determine if the stroke time exceeds the Limiting Value.

1. If the stroke time exceeds the Limiting Value, declare the valve inoperable and initiate a CR. (N/A if stroke time is less than the Limiting Value)

2. If the stroke time is less than the Limiting Value, but outside the Code Criteria limits, perform the following Steps:

   a. If the cause is known to be mechanical failure, or if a retest cannot be performed expeditiously, declare the valve inoperable and initiate a CR(except for PMTRs).

   b. If retesting the valve is desired, perform the following:

NOTE: If necessary, separate marked up sheets of this OST may be used to document necessary manipulations. These sheets would be attached to this procedure and noted in the comments Section of Attachment 6.

(1) Determine which Steps need to be performed to set up conditions for testing the valve. Unit SCO concurrence must be obtained and documented in the Comments section of Attachment 6.

(2) Perform the Steps determined in the previous Step and document stroke times/valve positioning on Sheet 2.

(3) If retest results are still outside the Code Criteria, declare the valve inoperable and initiate a CR(except for PMTRs).

(4) If retest results are within the Code Criteria, perform the following:

(a) Declare the valve operable.

(b) Initiate a CR identifying test findings for the first and second tests.

(c) Send test results to Responsible Engineer (IST) for evaluation and documentation on the CR.

Valve Retest Data Sheet

(1) Fill out PRETEST ALIGNMENT, POSTTEST ALIGNMENT, and ACCEPTANCE CRITERIA values for the valve(s) being tested using the values in the initial test Attachment.

PRETEST ALIGNMENT (1)			FULL STROKE TEST		POSTTEST ALIGNMENT (1)			ACCEPTANCE CRITERIA (SEC) (1)					
			Stroke Time (SEC)					CODE CRITERIA				LIMITING VALUE	
								OPEN		SHUT			
Valve Number	Pretest Position	Init	OPEN	SHUT	Posttest Position	Pos Init	Verf Init	Low	High	Low	High	OPEN	SHUT

Certifications and Reviews

This OST was performed as a:

Periodic Surveillance Requirement: ________
Postmaintenance Operability Test: ________
Redundant Subsystem Test: ________

Plant Conditions: ______________________________ Mode: ________

OST Completed By: ______________________________ Date: __________
Time: __________

OST Performed By:

Initials	Name (Print)	Initials	Name (Print)

General Comments/Recommendations/Corrective Actions/Exceptions:

Pages Used: ______________________________

Certifications and Reviews (continued)

		Time	Date
Step 7.1.0.011	1A-SA RHR Pump Inoperable	______	______
Step 7.1.0.047	1A-SA RHR Pump Operable	______	______
Step 7.2.0.03	1A-SA RHR Pump Inoperable	______	______
Step 7.2.0.014	1A-SA RHR Pump Operable	______	______
Step 7.3.0.03	1A-SA RHR Pump Inoperable	______	______
Step 7.3.0.030	1A-SA RHR Pump Operable	______	______

OST Completed with NO EXCEPTIONS/EXCEPTIONS:

______________________________ Date: __________
Unit SCO

Reviewed By: ______________________________ Date: __________
Responsible Engineer (IST)

Reviewed By: ______________________________ Date: __________
Responsible System Engineer

Reviewed By: ______________________________ Date: __________
ANII

After receiving the final review signature, this OST becomes a QA RECORD and should be submitted to Document Services.

Revision 13 Summary

General

This revision updated ISI baseline data for 1RH-25 dated 8/2/00. Also incorporated improvements to help minimize delay in performing section 7.2 due to current need to wait for discharge pressure to lower before proceeding. Admin changes made to remove task numbers from procedure due to Passport implementation and allow all documentation for testing of 1SI-341 and 1RH-31 to be completed in Section 7.1 per operator comment.

Description of Changes

Page	Section	Change Description
All		Updated to Revision 13.
4	3.0.4	Corrected NOTE to state that computer point will show "NCAL" quality code until the pump is running.
	3.0.10	Deleted task number for OST-1814 since Passport is deleting task numbers.(O S RM 092 and O S RM 093)
6	7.1.6	Added 1RH-31 to step.
8	7.1.19	Deleted task number for OST-1814 since Passport is deleting task numbers. (O S RM 092)
9	7.1.28	Deleted task number for Response Time Testing since Passport is deleting task numbers. (O S ER 065)
	7.1.29	Modified step to Shut 1SI-331. Moved Verifications to step 39 so that residual discharge pressure can be relieved to the RWST in step 38.
10	7.1.38,39	Added step to Open 1SI-331 after the RHR Pump is secured to allow pressure in the discharge line to be relieved to the RWST. This will prevent delay in performing Section 7.2. Shutting and verification of recirc valves moved here also.
11	7.1.45	Added 1RH-31 to step.
12	7.2.1	Deleted second NOTE since section 7.1 was changed to complete all documentation for 1SI-340 and 1SI-326 in that section.
17	7.4	Deleted step to document completion of tasks since task numbers are being deleted by Passport implementation.
22	Attachment 4	Updated ISI baseline data for 1RH-25.
24	Attachment 5	Added to 2.a and 2.b.3 that CRs are not necessary for PMTRs per IST program.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM SRO-B.1.c

Manually Align SI Following a LOSP

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Manually Align SI Following a LOSP

Alternate Path: CSIP alternate miniflow valve fails to close.

Facility JPM #: CR-056

K/A Rating: 006A4.02 Importance: SRO 3.8 RO NA

K/A Statement: Ability to manually operate and / or monitor in the control room: Valves

Task Standard: SI valves have been manually aligned per EPP-003, Step 2.

Preferred Evaluation Location: Simulator X In Plant ____

Preferred Evaluation Method: Perform X Simulate ____

References: EPP-003, Loss of All AC Power Recovery with SI Required

Validation Time: 5 minutes Time Critical: NO

Candidate: ____________________

Time Start: ________ Time Finish: ________

Performance Time: ________ minutes

Performance Rating: SAT ________ UNSAT ________

Comments: ____________________

____

Examiner: ____________________ Date: ________
Signature

Tools/Equipment/Procedures Needed:

EPP-003.

SIMULATOR OPERATOR INSTRUCTIONS: REFER TO NEXT PAGE, "SIMULATOR SETUP INSTRUCTIONS".

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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 plant was at 100 % power with the "B" EDG OOS.

A reactor trip occurred due to a loss of off-site power and the "A" EDG could not be started.

EPP-001 was entered and followed until power could be restored to 1A-SA and 1B-SB from off-site.

A transition has been made to EPP-003.

INITIATING CUES:

You are to manually align SI valves per EPP-003, Step 2, in preparation of establishing SI flow.

SIMULATOR SETUP INSTRUCTIONS

1) Reset to a 100% power IC.

2) Insert a failure of the "A" EDG to start <IMF DSG01 1>

3) Shift the "B" EDG to "Local and Maintenance Mode" <MRF DSG021 LOCAL and MRF DSG022 MAINTAIN>.

4) Then insert a loss of all AC <IMF EPS01 1>.

5) Once the plant is stable, initiate an SI and wait 60 seconds and RESET the SI signal.

6) Open the breakers for the sequencers <MRF EPS124 OPEN and MRF EPS125 OPEN> and control power for both CCW pumps <MRF CCW038 RACK_OUT and MFR CCW039 RACK_OUT>.

7) Then fail RCP "A" seal to the extent that a safety injection is needed <IMF RCS14A 100 0; IMF RCS15A; IMF RCS16A; and IMF RCS18A 4 0>.

8) Allow the pressurizer to empty and pressure to drop to < 1500 psig, then restore power to all buses <DMF EPS01>.

9) Use the EOP-001 attachment to restore power to 1A-SA and 1B-SB from off-site.

10) Fail 1CS-746 in the OPEN position <IOR XA2O189G OFF and IOR XA2O189R ON>.

11) Acknowledge and reset all alarms and place the simulator in FREEZE

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates EPP-003, Step 2 NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 2: Open CSIP suction from RWST valve, LCV-115B STANDARD: Control switch for LCV-115B placed in OPEN and valve verified open by indicating lights NOTES: ***CRITICAL TO ALIGN SUCTION TO CSIPs FROM RWST.*** ***NOTE: Steps 2 and 3 can be performed in any order AND it is only critical to open one or the other valves although it is expected that both valves will be opened.*** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 3:	Open CSIP suction from RWST valve, LCV-115D	**CRITICAL STEP**
STANDARD:	Control switch for LCV-115D placed in OPEN and valve verified open by indicating lights	
NOTES:	***CRITICAL TO ALIGN SUCTION TO CSIPs FROM RWST.*** ***NOTE: Steps 2 and 3 can be performed in any order AND it is only critical to open one or the other valves although it is expected that both valves will be opened.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Close VCT Outlet valve, LCV-115C	**CRITICAL STEP**
STANDARD:	Control switch for LCV-115C placed in CLOSE and valve verified closed by indicating lights	
NOTES:	***CRITICAL TO ENSURE PROPER ALIGNMENT FOR SI.*** ***NOTE: Steps 4 and 5 can be performed in any order AND it is only critical to close one or the other valves although it is expected that both valves will be closed.***	____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Close VCT Outlet valve, LCV-115E	**CRITICAL STEP**
STANDARD:	Control switch for LCV-115E placed in CLOSE and valve verified closed by indicating lights	
NOTES:	***CRITICAL TO ENSURE PROPER ALIGNMENT FOR SI.*** ***NOTE: Steps 4 and 5 can be performed in any order AND it is only critical to close one or the other valves although it is expected that both valves will be closed.***	____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Close Charging Line Isolation valve, 1CS-235	**CRITICAL STEP**
STANDARD:	Control switch for 1CS-235 placed in CLOSE and valve verified closed by indicating lights	
NOTES:	***CRITICAL TO ENSURE PROPER ALIGNMENT FOR SI.*** ***NOTE: Steps 6 and 7 can be performed in any order AND it is only critical to close one or the other valves although it is expected that both valves will be closed.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7: Close Charging Line Isolation valve, 1CS-238 STANDARD: Control switch for 1CS-238 placed in CLOSE and valve verified closed by indicating lights NOTES: ***CRITICAL TO ENSURE PROPER ALIGNMENT FOR SI.*** ***NOTE: Steps 6 and 7 can be performed in any order AND it is only critical to close one or the other valves although it is expected that both valves will be closed.*** COMMENTS:	____ SAT ____ UNSAT
STEP 8: Verifies RCS pressure below pressure which CSIP miniflow valves should be closed STANDARD: RCS pressure determined to be < 1800 psig NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 9:	Checks CSIP 'A' alternate miniflow valve, 1CS-746 closed	
STANDARD:	Determines 1CS-746 is open by position indicating lights	
NOTES:	***NOTE: Steps 9 through 11 or Step 12 may be performed in either order.***	____ SAT
COMMENTS:		____ UNSAT
STEP 10:	Attempts to close CSIP 'A' alternate miniflow valve, 1CS-746	
STANDARD:	Places 1CS-746 control switch to CLOSE and determines valve has failed to close	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 11:	Closes the failed alternate miniflow valve associated block valve, 1CS-745	**CRITICAL STEP**
STANDARD:	Places 1CS-745 control switch in CLOSE and verifies valve closed by indicating lights	
NOTES:	***CRITICAL TO ISOLATE FAILED OPEN MINIFLOW VALVE.***	____ SAT
COMMENTS:		____ UNSAT
STEP 12:	Checks CSIP 'B' alternate miniflow valve, 1CS-752 closed	
STANDARD:	Determines 1CS-752 is closed by position indicating lights	
NOTES:	***NOTE: Steps 9 through 11 or Step 12 may be performed in either order.***	____ SAT
COMMENTS:		____ UNSAT

STEP 13:	Closes normal miniflow isolation valve, ICS-182	**CRITICAL STEP**
STANDARD:	Places 1CS-182 control switch in CLOSE and verifies valve closed by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE REQUIRED SI FLOW.*** ***NOTE: Steps 13 through 16 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT
STEP 14:	Closes normal miniflow isolation valve, ICS-196	**CRITICAL STEP**
STANDARD:	Places 1CS-196 control switch in CLOSE and verifies valve closed by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE REQUIRED SI FLOW.*** ***NOTE: Steps 13 through 16 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT

STEP 15:	Closes normal miniflow isolation valve, ICS-210	**CRITICAL STEP**
STANDARD:	Places 1CS-210 control switch in CLOSE and verifies valve closed by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE REQUIRED SI FLOW.*** ***NOTE: Steps 13 through 16 may be performed in any order.***	____ SAT ____ UNSAT
COMMENTS:		
STEP 16:	Closes normal miniflow isolation valve, ICS-214	**CRITICAL STEP**
STANDARD:	Places 1CS-214 control switch in CLOSE and verifies valve closed by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE REQUIRED SI FLOW.*** ***NOTE: Steps 13 through 16 may be performed in any order.***	____ SAT ____ UNSAT
COMMENTS:		

STEP 17:	Opens BIT Inlet valve, 1SI-1	**CRITICAL STEP**
STANDARD:	Places 1SI-1 control switch in OPEN and verifies valve open by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE SI FLOW TO RCS.*** ***NOTE: Either Step 17 or 18 is critical. Steps 17 through 20 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT
STEP 18:	Opens BIT Inlet valve, 1SI-2	**CRITICAL STEP**
STANDARD:	Places 1SI-2 control switch in OPEN and verifies valve open by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE SI FLOW TO RCS.*** ***NOTE: Either Step 17 or 18 is critical. Steps 17 through 20 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT

STEP 19:	Opens BIT Outlet valve, 1SI-3	**CRITICAL STEP**
STANDARD:	Places 1SI-3 control switch in OPEN and verifies valve open by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE SI FLOW TO RCS.*** ***NOTE: Either Step 19 or 20 is critical. Steps 17 through 20 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT
STEP 20:	Opens BIT Outlet valve, 1SI-4	**CRITICAL STEP**
STANDARD:	Places 1SI-4 control switch in OPEN and verifies valve open by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE SI FLOW TO RCS.*** ***NOTE: Either Step 19 or 20 is critical. Steps 17 through 20 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant was at 100 % power with the "B" EDG OOS.

A reactor trip occurred due to a loss of off-site power and the "A" EDG could not be started.

EPP-001 was entered and followed until power could be restored to 1A-SA and 1B-SB from off-site.

A transition has been made to EPP-003.

INITIATING CUES:

You are to manually align SI valves per EPP-003, Step 2, in preparation of establishing SI flow.

Instructions	Response Not Obtained
2. Manually Align SI Valves To Establish SI Injection Mode:	
a. Open CSIP suction from RWST valves: LCV-115B LCV-115D	
b. Shut VCT outlet valves: LCV-115C LCV-115E	
c. Shut charging line isolation valves: 1CS-235 1CS-238	
d. Check RCS pressure - LESS THAN <u>OR</u> EQUAL TO 1800 PSIG	d. <u>WHEN</u> pressure less than 1800 PSIG, <u>THEN</u> do Step 2e. Continue with Step 2f.
e. Check CSIP alternate miniflow isolation valves - SHUT 1CS-746 (Train A CSIP) 1CS-752 (Train B CSIP)	e. Shut the associated block valve: 1CS-745 (Train A CSIP) 1CS-753 (Train B CSIP)
f. Shut normal miniflow isolation valves: 1CS-182 1CS-196 1CS-210 1CS-214	
g. Open BIT inlet AND outlet valves: 1SI-1 1SI-2 1SI-3 1SI-4	
3. Check Both CCW Pumps - STOPPED	Observe <u>CAUTION</u> prior to Step 5 AND GO TO Step 5.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-B.1.c

Establish High Head SI Flow

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Establish High Head SI Flow

Alternate Path: Cold leg injection valves fail to open

Facility JPM #: CR-122 (Modified)

K/A Rating: 006A4.07 Importance: SRO 4.4 RO 4.4

K/A Statement: Ability to manually operate and / or monitor in the control room: ECCS pumps and valves

Task Standard: Alternate injection flow path is established.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: FRP-C.2, Response to Degraded Core Cooling
PATH-1 Guide

Validation Time: 15 minutes Time Critical: NO

Candidate: ______________________________

Time Start: ______ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________________

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

FRP-C.1.
PATH-1 Guide, Attachment 1.

SIMULATOR OPERATOR INSTRUCTIONS: REFER TO NEXT PAGE, "SIMULATOR SETUP INSTRUCTIONS".

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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 plant has experienced a LB LOCA.

A MAGENTA path has been identified on CSFST for Core Cooling and a transition has been made to FRP-C.2, Response to Degraded Core Cooling.

INITIATING CUES:

You are to verify proper SI valve alignment and flow per FRP-C.2.

SIMULATOR SETUP INSTRUCTIONS

1) Reset to a 100% power IC.

2) Insert overrides to prevent 1SI-3 and 1SI-4 from opening, either automatically or manually.

3) Insert a large break LOCA

3) Perform the actions of EOP PATH-1, up through Step 53.

4) Acknowledge and reset all alarms and place the simulator in FREEZE

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates FRP-C.2 and PATH-1 Guide, Attachment 1 NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 2: Verifies charging line isolated STANDARD: Verifies 1CS-235 and 1CS-238 closed by position indicating lights NOTES: ***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.*** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Verifies CSIP suction from RWST aligned	
STANDARD:	Verifies LCV-115B and LCV-115D open by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Verifies CSIP suction from VCT isolated	
STANDARD:	Verifies LCV-115C and LCV-115E closed by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Verifies BIT inlet aligned	
STANDARD:	Verifies 1SI-1 and 1SI-2 open by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Determines BIT outlet improperly aligned	
STANDARD:	Determines 1SI-3 and 1SI-4 closed by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Attempts to align BIT outlet valves	
STANDARD:	Places 1SI-3 and 1SI-4 control switches to OPEN	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	Determines BIT outlet improperly aligned	
STANDARD:	Determines 1SI-3 and 1SI-4 still closed by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT

STEP 9:	Verifies CSIP alternate miniflow isolation valves properly aligned	
STANDARD:	Verifies 1CS-746 and 1CS-752 closed by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT
STEP 10:	Verifies CSIP alternate miniflow block valves properly aligned	
STANDARD:	Verifies 1CS-745 and 1CS-753 open by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT

STEP 11:	Verifies CSIP normal miniflow valves properly aligned	
STANDARD:	Verifies 1CS-214, 1CS-182, 1CS-I96, and 1CS-210 closed by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT
STEP 12:	Verifies low head SI to cold leg valves properly aligned	
STANDARD:	Verifies 1SI-340 and 1SI-341 open by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT

STEP 13:	Verifies low head SI to hot leg crossover valves properly aligned	
STANDARD:	Verifies 1SI-326 and 1SI-327 open by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT
STEP 14:	Verifies low head SI to hot leg valve 1SI-359 properly aligned	
STANDARD:	Verifies 1SI-359 closed by position indicating lights	
NOTES:	***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.***	____ SAT
COMMENTS:		____ UNSAT

STEP 15: Verifies RHR pump suction from RWST properly aligned STANDARD: Verifies 1SI-322 and 1SI-323 open by position indicating lights NOTES: ***NOTE: Steps 2 through 15 may be performed in any order provided Steps 7 and 8 are performed immediately following Step 6.*** COMMENTS:	____ SAT ____ UNSAT
STEP 16: Verifies CSIPs running STANDARD: Verifies CSIPs 1A-SA and 1B-SB running by pump status lights NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 17:	Determines SI flow is inadequate	
STANDARD:	Determines flow indication on FI-943 is zero	
NOTES:		____ SAT
COMMENTS:		____ UNSAT
STEP 18:	Energizes control power to alternate high head SI to cold legs valve 1SI-52	**CRITICAL STEP**
STANDARD:	Places control power for 1SI-52 to ON and verifies control power orange light ON	
NOTES:	***CRITICAL TO ALLOW OPERATING THE VALVE.*** ***NOTE: Only one set of Steps 18-20, 21-23, 24-26, or 27-29 are to be performed. Preferred that lower number steps be performed, but acceptable to perform any set.*** ***If Steps 18-20 are not performed, check Step as "N/A".***	____ SAT ____ UNSAT
COMMENTS:		____ N/A

STEP 19:	Establishes alternate high head SI to cold legs valve 1SI-52 flow path	**CRITICAL STEP**
STANDARD:	Places 1SI-52 control switch to OPEN and verifies valve opens by position indicating lights	
NOTES:	***CRITICAL TO ESTABLISH ALTERNATE HIGH HEAD INJECTION.*** ***NOTE: If Steps 18-20 are not performed, check Step as "N/A".***	____ SAT ____ UNSAT ____ N/A
COMMENTS:		
STEP 20:	Verifies SI flow indication	
STANDARD:	Verifies flow indication on FI-940 indicates > 200 gpm and FI-943 indicates zero.	
NOTES:	***NOTE: If Steps 18-20 are not performed, check Step as "N/A".*** ***If Steps 18-20 are performed, continue with Step 30.***	____ SAT ____ UNSAT ____ N/A
COMMENTS:		

STEP 21:	Energizes control power for SI to hot leg valve 1SI-86	**CRITICAL STEP**
STANDARD:	Places control power to ON and verifies control power orange light ON	
NOTES:	***CRITICAL TO ALLOW OPERATING THE VALVE.*** ***NOTE: Only one set of Steps 18-20, 21-23, 24-26, or 27-29 are to be performed. Preferred that lower number steps be performed, but acceptable to perform any set.*** ***If Steps 21-23 are not performed, check Step as "N/A".***	
COMMENTS:		____ SAT ____ UNSAT ____ N/A
STEP 22:	Establishes high head SI to hot legs valve 1SI-86 flow path	**CRITICAL STEP**
STANDARD:	Places 1SI-86 control switch to OPEN and verifies valve opens by position indicating lights	
NOTES:	***CRITICAL TO ESTABLISH ALTERNATE HIGH HEAD INJECTION.*** ***NOTE: If Steps 21-23 are not performed, check Step as "N/A".***	
COMMENTS:		____ SAT ____ UNSAT ____ N/A

STEP 23:	Verifies SI flow indication	
STANDARD:	Verifies flow indication on FI-940 indicates zero and FI-943 indicates > 200 gpm.	
NOTES:	***NOTE: If Steps 21-23 are not performed, check Step as "N/A".*** ***If Steps 21-23 are performed, continue with Step 30.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A
STEP 24:	Energizes control power for alternate high head SI to hot leg valve 1SI-107	**CRITICAL STEP**
STANDARD:	Places control power to ON and verifies control power orange light ON	
NOTES:	***CRITICAL TO ALLOW OPERATING THE VALVE.*** ***NOTE: Only one set of Steps 18-20, 21-23, 24-26, or 27-29 are to be performed. Preferred that lower number steps be performed, but acceptable to perform any set.*** ***If Steps 24-26 are not performed, check Step as "N/A".***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 25:	Establishes alternate high head SI to hot legs valve 1SI-107 flow path	
STANDARD:	Places 1SI-107 control switch to OPEN and verifies valve opens by position indicating lights	
NOTES:	***CRITICAL TO ESTABLISH ALTERNATE HIGH HEAD INJECTION.*** ***NOTE: If Steps 24-26 are not performed, check Step as "N/A".***	___ SAT ___ UNSAT ___ N/A
COMMENTS:		
STEP 26:	Verifies SI flow indication	
STANDARD:	Verifies flow indication on FI-940 indicates > 200 gpm and FI-943 indicates zero.	
NOTES:	***NOTE: If Steps 24-26 are not performed, check Step as "N/A".*** ***If Steps 24-26 are performed, continue with Step 30.***	___ SAT ___ UNSAT ___ N/A
COMMENTS:		

STEP 27:	Opens Charging Line Isolation valve 1CS-235	
STANDARD:	Places 1CS-235 control switch to OPEN and verifies valve opens by position indicating lights	
NOTES:	***CRITICAL TO ESTABLISH ALTERNATE HIGH HEAD INJECTION.*** ***NOTE: Only one set of Steps 18-20, 21-23, 24-26, or 27-29 are to be performed. Preferred that lower number steps be performed, but acceptable to perform any set.*** ***If Steps 27-29 are not performed, check Step as "N/A".***	____ SAT
COMMENTS:		____ UNSAT ____ N/A
STEP 28:	Opens Charging Line Isolation valve 1CS-238	**CRITICAL STEP**
STANDARD:	Places 1CS-238 control switch to OPEN and verifies valve opens by position indicating lights	
NOTES:	***CRITICAL TO ESTABLISH ALTERNATE HIGH HEAD INJECTION.*** ***NOTE: If Steps 27-29 are not performed, check Step as "N/A".***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 29:	Verifies Charging Flow	
STANDARD:	Verifies FI-122 indicates > 0 gpm	
NOTES:	***NOTE: If Steps 27-29 are not performed, check Step as "N/A".***	____ SAT ____ UNSAT ____ N/A
COMMENTS:		
STEP 30:	Verifies RHR pumps running due to RCS pressure < 190 psig	
STANDARD:	Verifies RHR pumps 1A-SA and 1B-SB running by pump status lights	
NOTES:		
COMMENTS:		____ SAT ____ UNSAT

STEP 31: Verifies adequate RHR flow STANDARD: Verifies both RHR train flows indicate > 1000 gpm NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 32: Informs Unit SCO that SI alignment and flow has been verified, but alternate path was established due to failure of BIT outlet valves STANDARD: Informs Unit SCO NOTES: ***CUE: Unit SCO acknowledges report.*** COMMENTS: ***END OF TASK***	____ SAT ____ UNSAT

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant has experienced a LB LOCA.

A MAGENTA path has been identified on CSFST for Core Cooling and a transition has been made to FRP-C.2, Response to Degraded Core Cooling.

INITIATING CUES:

You are to verify proper SI valve alignment and flow per FRP-C.2.

SI EMERGENCY ALIGNMENT

- Charging line isolation valves - SHUT:

  1CS-235
  1CS-238

- CSIP suction from RWST valves - OPEN:

  LCV 115B
  LCV 115D

- VCT outlet valves - SHUT:

  LCV 115C
  LCV 115E

- BIT valves - OPEN:

  1SI-1
  1SI-2
  1SI-3
  1SI-4

- CSIP alternate miniflow isolation valves - SHUT (IF RCS PRESSURE LESS THAN 1800 PSIG) <u>OR</u> OPEN (IF RCS PRESSURE GREATER THAN 2200 PSIG):

  1CS-746
  1CS-752

- CSIP alternate miniflow block valves - OPEN (UNLESS SHUT TO ISOLATE AN ALTERNATE MINIFLOW ISOLATION VALVE)

  1CS-745
  1CS-753

- CSIP normal miniflow valves - SHUT:

  1CS-214
  1CS-182
  1CS-196
  1CS-210

- Low head SI to cold leg valves - OPEN:

  1SI-340
  1SI-341

- Low head SI to hot leg crossover valves - OPEN:

  1SI-326
  1SI-327

- Low head SI to hot leg valve - SHUT:

  1SI-359

- RWST to RHR pump suction valves - OPEN:

  1SI-322
  1SI-323

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT

PLANT OPERATING MANUAL

VOLUME 3

PART 4

PROCEDURE TYPE: EMERGENCY OPERATING PROCEDURE (EOP)
FUNCTION RESTORATION PROCEDURE (FRP)

NUMBER: EOP-FRP-C.2

TITLE: RESPONSE TO DEGRADED CORE COOLING

REVISION 8

CONTINUOUS USE
Continuous Use of Procedure Required. Read Each Step Before Performing.

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PURPOSE/ENTRY CONDITIONS

This procedure provides actions to restore adequate core cooling.

FOLDOUT

- COLD LEG RECIRCULATION SWITCHOVER CRITERIA

  IF RWST level decreases to less than 23.4% (2/4 Low-Low alarm), THEN GO TO EPP-010, "TRANSFER TO COLD LEG RECIRCULATION", Step 1.

- AFW SUPPLY SWITCHOVER CRITERIA

  IF CST level decreases to less than 10%, THEN switch the AFW water supply to the ESW system using OP-137, "AUXILIARY FEEDWATER SYSTEM", Section 8.1.

- RHR RESTART CRITERIA

  IF RCS pressure decreases to less than 190 PSIG, THEN restart RHR pumps to supply water to the RCS.

Instructions	Response Not Obtained

****

CAUTION

To minimize further degradation of core cooling, RCPs should NOT be tripped except as directed by this procedure. (Normal conditions for running RCPs are desired but not required.)

****

NOTE: Foldout applies.

---

1. Verify SI Valves - PROPERLY ALIGNED

   (Refer to PATH-1 GUIDE, Attachment 1.)

FOLDOUT

- <u>COLD LEG RECIRCULATION SWITCHOVER CRITERIA</u>

  <u>IF</u> RWST level decreases to less than 23.4% (2/4 Low-Low alarm), <u>THEN</u> GO TO EPP-010, "TRANSFER TO COLD LEG RECIRCULATION", Step 1.

- <u>AFW SUPPLY SWITCHOVER CRITERIA</u>

  <u>IF</u> CST level decreases to less than 10%, <u>THEN</u> switch the AFW water supply to the ESW system using OP-137, "AUXILIARY FEEDWATER SYSTEM", Section 8.1.

- <u>RHR RESTART CRITERIA</u>

  <u>IF</u> RCS pressure decreases to less than 190 PSIG, <u>THEN</u> restart RHR pumps to supply water to the RCS.

Instructions	Response Not Obtained
2. Verify SI Flow In All Trains:	
a. Verify CSIPs - RUNNING	
b. SI flow - GREATER THAN 200 GPM	b. Establish any other high head injection flowpath (listed in order of preference): 1) Alternate high head SI to cold legs 2) High head SI to hot legs 3) Alternate high head SI to hot legs 4) Charging flow path
c. RCS pressure - LESS THAN 190 PSIG	c. Stop RHR pumps. GO TO Step 3.
d. Verify RHR pumps - RUNNING	d. GO TO Step 3.
e. Both RHR HX header flows - GREATER THAN 1000 GPM	e. Verify RHR valves - PROPERLY ALIGNED: 1) Verify RHR pump suction - ALIGNED TO RWST <u>OR</u> CNMT RECIRC SUMP 2) Verify RHR HX outlet valves - OPEN: 1RH-30 1RH-66 3) Verify Low head SI to cold leg valves - OPEN 1SI-340 1SI-341

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-B.1.d

Restore Off-Site Power to an Emergency Bus

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Restore Off-Site Power to an Emergency Bus

Alternate Path: NONE

Facility JPM #: CR-027

K/A Rating: 062A4.01 Importance: SRO 3.1 RO 3.3

K/A Statement: Ability to manually operate and / or monitor in the control room: All breakers (including available switchyard)

Task Standard: Bus 1A-SA is energized from off-site power.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: OP-156.02, AC Electrical Distribution

Validation Time: 10 minutes Time Critical: NO

Candidate: ______________________________

Time Start: __________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________________

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OP-156.02.
Synchronization Key.

SIMULATOR OPERATOR INSTRUCTIONS:

1) Initialize to any 100% power IC.
2) Disable EDG 1A-SA.
3) Insert a loss of offsite power.
4) Verify EDG 1B-SB is supplying its bus.
5) Ensure switchyard is re-energized.
6) Acknowledge and reset all alarms and place the simulator in FREEZE.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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:

A loss of off-site power has occurred.

Bus 1B-SB is being carried by the EDG, but EDG 1A-SA failed to start. The switchyard has been re-energized.

INITIATING CUES:

You are to restore power to Bus 1A-SA from off-site power per OP-156.02, Section 8.17.

The dispatcher has given permission to reset the SUT lockout relay and re-energize the bus from off-site power. All initial conditions have been met.

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates OP-156.02, Section 8.17 NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 2: Verifies the START UP XFMR 1A LOCKOUT SU 1A relay on SU XFMR PROTECTIVE RELAY PANEL 1A is reset STANDARD: Verifies the START UP XFMR 1A LOCKOUT SU 1A relay on SU XFMR PROTECTIVE RELAY PANEL 1A reset by black flag and white indicating light lit NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Closes 52-2, Startup Xfmr 1A/Cape Fear Tie, and / or 52-3, Startup Xfmr 1A	**CRITICAL STEP**
STANDARD:	Places 52-2 and / or 52-3 control switch to CLOSE and verifies closed by position indicating lights	
NOTES:	***CRITICAL TO ALLOW PROVIDING POWER FROM OFF-SITE TO BUS.*** ***NOTE: Either one or both of the switches may be taken to close.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Verifies power available to SUT from X-windings	
STANDARD:	Rotates Start Up Xfmr A X Winding Voltage through all positions and verifies voltmeter EI-503, X Winding Volts, reading between 6.55 and 7.25KV	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Verifies power available to SUT from Y-windings	
STANDARD:	Rotates Start Up Xfmr A Y Winding Voltage through all positions and verifies voltmeter EI-504, Y Winding Volts, reading between 6.55 and 7.25KV	
NOTES:		____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Verifies Auxiliary Bus 1D de-energized	
STANDARD:	Directs AO to verify that all load feeder breakers are open on Auxiliary Bus 1D as required per the Unit SCO.	
NOTES:	***CUE: AO reports all load feeder breakers on Aux Bux 1D are open.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Energizes synchronizing circuit	**CRITICAL STEP**
STANDARD:	Places the START UP XFMR A TO AUX BUSES A & D SYNCHRONIZER switch in the BKR 101 position	
NOTES:	***CRITICAL TO ENABLE CLOSING OF BREAKER.***	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	Energizes Aux Bus 1D	**CRITICAL STEP**
STANDARD:	Places BKR 101, START UP XFMR A TO AUX BUS D, in the CLOSE position and verifies breaker closes by position indicating lights	
NOTES:	**CRITICAL TO PROVIDE POWER TO AUX BUS.**	____ SAT
COMMENTS:		____ UNSAT

STEP 9: Verifies proper voltage on Aux Bus 1D STANDARD: Verifies voltage on EI-561, AUX BUS 1D VOLT, is between 6.55 to 7.25KV. NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 10: De-energizes synchronizing circuit STANDARD: Places the START UP XFMR A TO AUX BUSES A & D SYNCHRONIZER switch in the OFF position NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 11: Closes Aux Bus 1D supply to Bus 1A-SA STANDARD: Places BREAKER 104, AUX BUS D TO EMERGENCY BUS A-SA, in the CLOSE position and verifies breaker closes by position indicating lights NOTES: ***CRITICAL TO PROVIDE POWER TO BUS.*** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT
STEP 12: Energizes synchronizing circuit for breaker 105 STANDARD: Places EMERGENCY BUS A-SA TO AUX BUS D SYNCHRONIZER Switch in the SYNC position NOTES: ***CRITICAL TO ALLOW CLOSURE OF BREAKER.*** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 13:	Closes supply breaker to 1A-SA from Aux Bus D	**CRITICAL STEP**
STANDARD:	Places BREAKER 105 SA, EMERGENCY BUS A-SA TO AUX BUS D TIE, in the CLOSE position and verifies breakers closes by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE POWER TO BUS.***	
COMMENTS:		____ SAT ____ UNSAT
STEP 14:	Verifies proper voltage on Bus 1A-SA	
STANDARD:	Verifies EI-6956A1 SA, EMER BUS A VOLTS, indicates between 6.55 and 7.25KV across each phase.	
NOTES:		
COMMENTS:		____ SAT ____ UNSAT

STEP 15: De-energizes synchronizing circuit STANDARD: Places the EMERGENCY BUS A-SA TO AUX BUS D SYNCHRONIZER Switch in the OFF position NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 16: Verifies Emergency Bus A3 Supply Breaker, A3 B-SA, closed STANDARD: Verifies breaker closed by position indicating lights NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 17:	Verifies Emergency Bus A SA to Xfmr A3 SA, A3 A-SA, closed	**CRITICAL STEP**
STANDARD:	Places breaker A3 A-SA in the CLOSE position and verifies breakers closes by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE POWER TO BUS.***	
COMMENTS:		____ SAT ____ UNSAT
STEP 18:	Verifies Emergency Bus A2 Supply Breaker, A2 B-SA, closed	
STANDARD:	Verifies breaker closed by position indicating lights	
NOTES:		
COMMENTS:		____ SAT ____ UNSAT

STEP 19: Verifies Emergency Bus A SA to Xfmr A2 SA, A2 A-SA, closed STANDARD: Verifies breaker closed by position indicating lights NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 20: Verifies Emergency Bus A1 Supply Breaker, A1 B, closed STANDARD: Verifies breaker closed by position indicating lights NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 21:	Verifies Emergency Bus A SA to Xfmr A1, A1 A-SA, closed	**CRITICAL STEP**
STANDARD:	Places breaker A1 A-SA in the CLOSE position and verifies breakers closes by position indicating lights	
NOTES:	***CRITICAL TO PROVIDE POWER TO BUS.***	
COMMENTS:		____ SAT ____ UNSAT
STEP 22:	Informs Unit-SCO that Bus 1A-SA is being supplied by off-site power	
STANDARD:	Informs Unit SCO	
NOTES:	***CUE: Unit SCO acknowledges report.***	
COMMENTS:		____ SAT ____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A loss of off-site power has occurred.

Bus 1B-SB is being carried by the EDG, but EDG 1A-SA failed to start. The switchyard has been re-energized.

INITIATING CUES:

You are to restore power to Bus 1A-SA from off-site power per OP-156.02, Section 8.17.

The dispatcher has given permission to reset the SUT lockout relay and re-energize the bus from off-site power. All initial conditions have been met.

8.17 Restoration of Off-site Power to Emergency Buses
R (Reference 2.7.0.07)

8.17.1 Initial Conditions

1. Dispatchers permission to energize START-UP Aux XFMR A and/or B obtained.

2. 6.9 KV emergency bus 1A-SA (1B-SB) is either de-energized or is energized by EDG 1A-SA (1B-SB).

3. BKR 101, Start up XFMR A to Aux Bus D (BKR 121, Start up XFMR B to Aux Bus E) is open.

4. If the lockout relay for either Start Up Transformer is tripped, Load Dispatcher permission to reset the relay has been obtained.

NOTE:
- This section restores offsite power assuming control power is available to the 6.9 KV breakers.
- If control power is NOT available for breakers on Aux Bus 1D, Section 8.25 provides direction to restore offsite power to Emergency Bus A-SA.
- If control power is NOT available for breakers on Aux Bus 1E, Section 8.26 provides direction to restore offsite power to Emergency Bus B-SB.

5. Control power is available to all of the following 6.9 KV breakers:

   a. Aux Bus 1D:

      - START UP XFMR A TO AUX BUS D BREAKER 101
      - UNIT AUX XFMR A TO AUX BUS D BREAKER 102
      - AUX BUS D TO EMERGENCY BUS A-SA BREAKER 104

   b. Aux Bus 1E:

      - START UP XFMR B TO AUX BUS E BREAKER 121
      - UNIT AUX XFMR TO AUX BUS E BREAKER 122
      - AUX BUS E TO EMERGENCY BUS B-SB BREAKER 124

8.17.2 Procedural Steps

NOTE: Step 8.17.2.01 energizes Bus 1A-SA, while Step 8.17.2.02 energizes Bus 1B-SB.

CAUTION

Tripping of a Start Up Transformer Lockout Relay indicates a major fault on the transformer. Re-energizing the transformer may cause additional damage and should NOT be done without Load Dispatcher permission.

---

1. Restore off-site Power to 6.9KV Emergency Bus A-SA by performing the following:

   a. Verify the START UP XFMR 1A LOCKOUT SU 1A relay on SU XFMR PROTECTIVE RELAY PANEL 1A is reset.

   b. Close 52-2 and/or 52-3.

NOTE: Steps 8.17.2.01.c through 8.17.2.01.p are performed at the MCB.

CAUTION

Do not attempt to manually reset the 6.9KV Undervoltage Relay Lockout Devices before energizing the 6.9KV buses, or severe damage may result to the relay devices.

---

   c. Verify the availability to SUT 1A, as indicated by the following voltmeters reading between 6.55 and 7.25KV across each phase:

      (1) EI-503, X Winding Volts.

      (2) EI-504, Y Winding Volts.

CAUTION

Lack of breaker lights does not mean that the breaker is open, only that control power is off.

---

   d. Verify that all load feeder breakers are open on Auxiliary Bus 1D as required per the Unit SCO.

NOTE: The position of the synchroscope does not reflect actual phase difference and does not need to be at 12 O'CLOCK to close BKR 101.

   e. Place the START UP XFMR A TO AUX BUSES A & D SYNCHRONIZER switch in the BKR 101 position.

   f. Place BKR 101, START UP XFMR A TO AUX BUS D, in the CLOSE position.

   g. Verify voltage on EI-561, AUX BUS 1D VOLT, is between 6.55 to 7.25KV.

8.17.2 Procedural Steps (continued)

h. Place the START UP XFMR A TO AUX BUSES A & D SYNCHRONIZER switch in the OFF position.

CAUTION

- Do not attempt to manually reset the 6.9KV undervoltage relay lockout devices before energizing the 6.9KV buses, or severe damage may result to the relay devices.
- Lack of breaker lights does not mean that the breaker is open, only that control power is off.

---

i. Place BREAKER 104, AUX BUS D TO EMERGENCY BUS A-SA, in the CLOSE position.

j. If BREAKER 106 SA, DIESEL GEN A-SA, is closed with EDG energizing bus 1A-SA, synchronize and transfer off-site power with EDG A-SA per OP-155 and disregard the following Steps 8.17.2.01.k through 8.17.2.01.p.

k. If BREAKER 106 SA, DIESEL GEN A-SA is open, perform Steps 8.17.2.01.l through 8.17.2.01.p below to energize bus 1A-SA.

l. Place EMERGENCY BUS A-SA TO AUX BUS D SYNCHRONIZER Switch in the SYNC position.

m. Place BREAKER 105 SA, EMERGENCY BUS A-SA TO AUX BUS D TIE, in the CLOSE position.

n. Verify EI-6956A1 SA, EMER BUS A VOLTS, indicates between 6.55 and 7.25KV across each phase.

o. Place the EMERGENCY BUS A-SA TO AUX BUS D SYNCHRONIZER Switch in the OFF position.

p. Verify the following breakers are closed:

(1) A3 B-SA, EMERGENCY BUS A3 SA SUPPLY BREAKER.

(2) A3 A-SA, EMERGENCY BUS A SA TO XFMR A3 SA.

(3) A2 B-SA, EMERGENCY BUS A2 SA SUPPLY BREAKER.

(4) A2 A-SA, EMERGENCY BUS A SA TO XFMR A2 SA.

(5) A1 B, EMERGENCY BUS A1 SUPPLY BREAKER.

(6) A1 A-SA, EMERGENCY BUS A SA TO XFMR A1.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-B.1.e

Secure One Train of CCW to the RHR HXs

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Secure One Train of CCW to the RHR HXs

Alternate Path: NONE

Facility JPM #: NEW

K/A Rating: 008A4.01 Importance: SRO NA RO 3.3

K/A Statement: Ability to operate and / or monitor in the control room: CCW indications and controls

Task Standard: Train 'A' CCW is supplying the RHR HX and the non-essential loop.

Preferred Evaluation Location: Simulator X In Plant ____

Preferred Evaluation Method: Perform X Simulate ____

References: OP-145, Component Cooling Water

Validation Time: 10 minutes Time Critical: NO

Candidate: ____________________

Time Start: ________ Time Finish: ________

Performance Time: ________ minutes

Performance Rating: SAT ________ UNSAT ________

Comments: ____________________

____

Examiner: ____________________ Date: ________
Signature

Tools/Equipment/Procedures Needed:

OP-145.

SIMULATOR OPERATOR INSTRUCTIONS:
1) Initialize to an IC where RHR is in operation (IC-2).
2) Ensure both 'A' and 'B' CCW pumps are operating.
3) Ensure the following valves are open: 1CC-147, 1CC-167, 1CC-113, and 1CC-127.
4) Ensure the following valves are closed: 1CC-99 and 1CC-128.
5) Adjust CCW flows <MRF CCW030 25>.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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 plant is in Mode 4.

Both trains of CCW are in operation, with Train 'A' CCW supplying only the essential loop and Train 'B' CCW supplying the essential and non-essential loops.

INITIATING CUES:

You are to secure CCW Pump 'B' in accordance with OP-145, Section 8.14.

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates OP-145, Section 8.14 NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 2: Isolates CCW for the RHR HX to be taken out of service STANDARD: Closes 1CC-167, CCW FROM RHR HEAT EXCHANGER B-SB, and verifies the valve closed by position indicating lights NOTES: ***CRITICAL TO ESTABLISH FLOW LIMITATIONS WITHIN THE CAPABILITY OF A SINGLE PUMP.*** COMMENTS:	**CRITICAL STEP** ____ SAT ____ UNSAT

STEP 3:	Verifies system flow within limits of a single pump	
STANDARD:	Verifies total system flow is less than 11,000 gpm by adding the indication on FI-652.1 and FI-653.1	
NOTES:		____ SAT ____ UNSAT
COMMENTS:		
STEP 4:	Verifies 1CC-99, CCW HEAT EXCHANGER A TO NONESSENTIAL SUP, open	**CRITICAL STEP**
STANDARD:	Places 1CC-99 control switch in OPEN and verifies the valve opens by observing position indicating lights	
NOTES:	***CRITICAL TO ALLOW SUPPLYING THE NON-ESSENTIAL LOOP FROM THE RUNNING CCW PUMP.***	____ SAT ____ UNSAT
COMMENTS:		

STEP 5: Verifies 1CC-113, CCW HEAT EXCHANGER B TO NONESSENTIAL SUP, open STANDARD: Verifies 1CC-113 OPEN by observing position indicating lights NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 6: Verifies 1CC-127, CCW NONESSENTIAL RETURN TO HEADER B, open STANDARD: Verifies 1CC-127 OPEN by observing position indicating lights NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 7:	Verifies 1CC-128, CCW NONESSENTIAL RETURN TO HEADER A, open	**CRITICAL STEP**
STANDARD:	Places 1CC-128 control switch in OPEN and verifies the valve opens by observing position indicating lights	
NOTES:	***CRITICAL TO ALLOW SUPPLYING THE NON-ESSENTIAL LOOP FROM THE RUNNING CCW PUMP.***	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	Stop CCW Pump 1B-SB	**CRITICAL STEP**
STANDARD:	Places CCW Pump 1B-SB control switch in STOP and verifies the pump stops by observing breaker indicating lights	
NOTES:	***CRITICAL TO ESTABLISH A SINGLE RUNNING CCW PUMP.***	____ SAT
COMMENTS:		____ UNSAT

STEP 9: Verifies proper flow indication STANDARD: Verifes flow indication on FI-652.1 is < 11,000 gpm and FI-653.1 is 0 gpm NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 10: Verifies adequate system pressure STANDARD: Verifies CCW header pressure indicates > 75 psig NOTES: COMMENTS: ***END OF TASK***	____ SAT ____ UNSAT

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant is in Mode 4.

Both trains of CCW are in operation, with Train 'A' CCW supplying only the essential loop and Train 'B' CCW supplying the essential and non-essential loops.

INITIATING CUES:

You are to secure CCW Pump 'B' in accordance with OP-145, Section 8.14.

8.14 Securing the Second CCW Pump While Supplying Both RHR Heat Exchangers

8.14.1 Initial Conditions

1. Two CCW pumps are in service.

2. Both trains of RHR and the non-essential loop are being supplied by CCW with the loop cross-connect valves shut.

3. It is desired to secure CCW flow to one RHR train and secure the second CCW pump.

8.14.2 Procedural Steps

NOTE: The purpose of these steps are to ensure CCW total system flow is less than 11,000 gpm prior to securing a CCW pump. This will prevent the possibility of pump runout.

8.14.2.1. If the RHR train to be taken out of service is being supplied by the same CCW pump as the Non-Essential loop then perform the following steps:

1. For the RHR HX to be taken out of service, Shut 1CC-147 (1CC-167), CCW FROM RHR HEAT EXCHANGER A-SA (B-SB) .

2. Verify total system flow is less than 11,000 gpm.

3. Verify open, the following valves:

- 1CC-99, CCW HEAT EXCHANGER A TO NONESSENTIAL SUP
- 1CC-113, CCW HEAT EXCHANGER B TO NONESSENTIAL SUP
- 1CC-127, CCW NONESSENTIAL RETURN TO HEADER B
- 1CC-128, CCW NONESSENTIAL RETURN TO HEADER A

CAUTION

CCW flow must not exceed 11,000 gpm total flow with one CCW pump in service, or pump runout can occur.

NOTE: If pressure falls below 61 psig, the CCW pump will restart.

4. At the MCB, stop the desired CCW Pump A-SA or B-SB.

5. Verify Train A(B) flow stops via FI-652.1 (FI-653.1) and that pressure remains greater than 75 psig as per PI-649 (PI-650).

8.14.2.2. If the RHR train to be taken out of service is the only flowpath for the CCW pump, perform the following steps:

1. Station an operator at the power supply breaker 6.9KV 1A-SA-8 (6.9KV 1B-SB-8) for the CCW pump to be secured.

8.14 <u>Securing the Second CCW Pump While Supplying Both RHR Heat Exchangers</u> (Cont.)

8.14.2.2 (Cont.)

<u>NOTE</u>: Performance of the next step will make the associated CCW Pump inoperable.

2. At the MCB, place and HOLD the CCW Pump control switch, CCW PUMP A-SA(B-SB) to STOP until the applicable loop pressure falls below 61 psig, then release the switch.

3. For the RHR HX to be taken out of service, Shut 1CC-147 (1CC-167), CCW FROM RHR HEAT EXCHANGER A-SA (B-SB)

4. Verify open, the following valves:

   - 1CC-99, CCW HEAT EXCHANGER A TO NONESSENTIAL SUP
   - 1CC-113, CCW HEAT EXCHANGER B TO NONESSENTIAL SUP
   - 1CC-127, CCW NONESSENTIAL RETURN TO HEADER B
   - 1CC-128, CCW NONESSENTIAL RETURN TO HEADER A

5. Verify CCW system pressures are greater than 75 psig on each train CCW HX A(B) DISCH HDR PRESS, PI-649 (PI-650).

<u>NOTE</u>: Performance of the next step will make the associated CCW Pump operable.

6. Open, then close the 125VDC Control Power Knife Switch at 6.9KV 1A-SA-8 (6.9KV 1B-SB-8)to reset the anti-pumping feature.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-B.1.f

Place Containment Cooling in Maximum Cooling Mode

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Place Containment Cooling in Maximum Cooling Mode

Alternate Path: Lead fan in AH-1 fails to start.

Facility JPM #: CR-033 (Modified)

K/A Rating: 022A4.01 Importance: SRO NA RO 3.6

K/A Statement: Ability to operate and / or monitor in the control room: CCS fans

Task Standard: Containment Cooling Air Handling Unit fans are running in Maximum Cooling Mode.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: OP-169, Containment Cooling And Ventilation
APP-ALB-029, Main Control Board

Validation Time: 10 minutes Time Critical: NO

Candidate: ______________________

Time Start: ______ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________

____

Examiner: ______________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OP-169.
APP-ALB-029.

SIMULATOR OPERATOR INSTRUCTIONS:
1) Initialize to a 100% power IC.
2) Ensure Train A Containment Cooling Fans are running in hi-speed (AH-2 A-SA and B-SA and AH-3 A-SA and B-SA).
3) NSW to 'A' ESW header and 'B' ESW pump is running.
4) Insert override to prevent start of AH-1 A-SB fan.
5) Insert overrides for Containment Temperature for 120°F.
- ICOR TT:7541 120
- ICOR TT:7542 120
6) Acknowledge and reset all alarms and FREEZE simulator.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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:

ALB-029-3-1, CONTAINMENT AVERAGE TEMP, is alarming.
Containment temperature is approximately 120°F. Train 'A' Containment Fan Cooler fans are currently running.

NSW is aligned to 'A' ESW header and 'B' ESW pump is running.

INITIATING CUES:

You are to start up the Containment Fan Cooler Units in the maximum cooling mode.

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates OP-169, Section 8.1 (Step 8.1.2.1) NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 2: Attempts to start a fan in LO-SPD for AH-1 STANDARD: Places the control switch for fan cooler AH-1 A-SB to LO-SPD and determines the fan fails to start by observing fan position indicating lights NOTES: ***CONDITIONAL CUE: If candidate defers to Unit SCO for guidance, direct candidate to start other fan.*** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Starts the remaining fan for AH-1 in LO-SPD	**CRITICAL STEP**
STANDARD:	Places AH-1 B-SB control switch in LO-SPD and verifies fan starts by observing fan status lights	
NOTES:	***CRITICAL TO START IN LO-SPD BEFORE HI-SPD TO PREVENT FAN TRIP.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Places control switch for AH-1 B-SB in STOP	
STANDARD:	Places AH-1 B-SB in STOP position	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Starts AH-1 B-SB in HI-SPD	**CRITICAL STEP**
STANDARD:	Before AH-1 B-SB coasts down, places control switch in HI-SPD and verifies fan starts by observing fan status lights	
NOTES:	***CRITICAL TO START BEFORE COAST DOWN TO PREVENT TRIP AND TO START TO PROVIDE ADEQUATE COOLING.***	____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Stops one fan in AH-2	**CRITICAL STEP**
STANDARD:	Places either AH-2 A-SA or AH-2 B-SA control switch to STOP and verifies fan stops by observing fan status lights	
NOTES:	***CRITICAL FOR PROPER ALIGNMENT OF CONTAINMENT COOLING.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Starts AH-4 A-SB in LO-SPD	**CRITICAL STEP**
STANDARD:	Places AH-4 A-SB control switch in LO-SPD and verifies fan starts by observing fan status lights	
NOTES:	***CRITICAL TO START IN LO-SPD BEFORE HI-SPD TO PREVENT FAN TRIP.*** ***NOTE: Steps 7 and 8 can be performed in either order.***	____ SAT
COMMENTS:		____ UNSAT
STEP 8:	Starts AH-4 B-SB in LO-SPD	**CRITICAL STEP**
STANDARD:	Places AH-4 B-SB control switch in LO-SPD and verifies fan starts by observing fan status lights	
NOTES:	***CRITICAL TO START IN LO-SPD BEFORE HI-SPD TO PREVENT FAN TRIP.*** ***NOTE: Steps 7 and 8 can be performed in either order.***	____ SAT
COMMENTS:		____ UNSAT

STEP 9:	Places control switch for AH-4 A-SB in STOP	
STANDARD:	Places AH-4 A-SB in STOP position	
NOTES:	**NOTE: Steps 9 - 10 or Steps 11 -12 may be performed in either order, provided Step 10 is performed immediately following Step 9 and Step 12 is performed immediately following Step 11.**	____ SAT
COMMENTS:		____ UNSAT
STEP 10:	Starts AH-4 A-SB in HI-SPD	**CRITICAL STEP**
STANDARD:	Before AH-4 A-SB coasts down, places control switch in HI-SPD and verifies fan starts by	
NOTES:	***CRITICAL TO START BEFORE COAST DOWN TO PREVENT TRIP AND TO START TO PROVIDE ADEQUATE COOLING.***	____ SAT
COMMENTS:		____ UNSAT

STEP 11:	Places control switch for AH-4 B-SB in STOP	
STANDARD:	Places AH-4 B-SB in STOP position	
NOTES:	**NOTE: Steps 9 - 10 or Steps 11 -12 may be performed in either order, provided Step 10 is performed immediately following Step 9 and Step 12 is performed immediately following Step 11.**	____ SAT
COMMENTS:		____ UNSAT
STEP 12:	Starts AH-4 B-SB in HI-SPD	**CRITICAL STEP**
STANDARD:	Before AH-4 B-SB coasts down, places control switch in HI-SPD and verifies fan starts by observing fan status lights	
NOTES:	***CRITICAL TO START BEFORE COAST DOWN TO PREVENT TRIP AND TO START TO PROVIDE ADEQUATE COOLING.***	____ SAT
COMMENTS:		____ UNSAT

STEP 13: Verifies post accident damper CV-D5 is open STANDARD: Verifies CV-D5 is OPEN on Status Light Box 5 NOTES: **NOTE: Steps 13 or 14 may be performed in either order.** COMMENTS:	____ SAT ____ UNSAT
STEP 14: Verifies post accident damper CV-D7 is open STANDARD: Verifies CV-D7 is OPEN on Status Light Box 6 NOTES: **NOTE: Steps 13 or 14 may be performed in either order.** COMMENTS:	____ SAT ____ UNSAT

STEP 17:	Inform Unit SCO that Containment Fan Coolers are aligned for maximum cooling operation	
STANDARD:	Informs Unit SCO	
NOTES:	***CUE: Unit SCO acknowledges report.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET

(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

ALB-029-3-1, CONTAINMENT AVERAGE TEMP, is alarming.
Containment temperature is approximately 120°F. Train 'A' Containment Fan Cooler fans are currently running.

NSW is aligned to 'A' ESW header and 'B' ESW pump is running.

INITIATING CUES:

You are to start up the Containment Fan Cooler Units in the maximum cooling mode.

8.0 INFREQUENT OPERATIONS

8.1 Start Up of Fan Cooler Units (Maximum Cooling mode)

8.1.1 Initial Conditions

1. Fan Cooler Units in operation as per Section 5.1 of this procedure.

2. Both ESW headers are in service per OP-139.

3. If Containment temperatures are near the alarm setpoint then at least one ESW pump is in service.

8.1.2 Procedural Steps

NOTE: During this mode of operation, both Train A and Train B are in operation. AH-3 and AH-4 will be discharging to the post accident dampers.

1. With Train A in operation as per Section 5.1 of this procedure, perform the following steps:

   a. Place the control switch for one fan cooler in AH-1 to LO-SPD.

NOTE: Steps 8.1.2.01.b and 8.1.2.01.c must be done without delay. The fan should not be allowed to coast down before being started in fast speed.

   b. Place the control switch for the fan started in Step 8.1.2.01.a to STOP.

   c. Place the control switch for the fan stopped in Step 8.1.2.01.b to HI-SPD.

   d. Stop one fan in AH-2.

   e. Place the control switch for fan cooler AH-4 A-SB to LO-SPD.

   f. Place the control switch for fan cooler AH-4 B-SB to LO-SPD.

NOTE: Steps 8.1.2.01.g and8.1.2.01.h must be done without delay. The fan should not be allowed to coast down before being started in fast speed.

   g. Place the control switch for fan cooler AH-4 A-SB to STOP.

   h. Place the control switch for fan cooler AH-4 A-SB to HI-SPD.

NOTE: Steps 8.1.2.01.i and 8.1.2.01.j must be done without delay. The fan should not be allowed to coast down before being started in fast speed.

   i. Place the control switch for fan cooler AH-4 B-SB to STOP.

   j. Place the control switch for fan cooler AH-4 B-SB to HI-SPD.

   k. Verify CV-D5 is OPEN on Status Light Box 5.

   l. Verify CV-D7 is OPEN on Status Light Box 6.

8.1.2 Procedural Steps (continued)

2. With Train B in operation as per Section 5.1 of this procedure, perform the following steps:

   a. Place the control switch for one fan cooler in AH-2 to LO-SPD.

NOTE: Steps 8.1.2.02.b and 8.1.2.02.c must be done without delay. The fan should not be allowed to coast down before being started in fast speed.

   b. Place the control switch for the fan started in Step 8.1.2.02.a to STOP.

   c. Place the control switch for the fan stopped in Step 8.1.2.02.b to HI-SPD.

   d. Stop one fan in AH-1.

   e. Place the control switch for fan cooler AH-3 A-SA to LO-SPD.

   f. Place the control switch for fan cooler AH-3 B-SA to LO-SPD.

NOTE: Steps 8.1.2.02.g and 8.1.2.02.h must be done without delay. The fan should not be allowed to coast down before being started in fast speed.

   g. Place the control switch for fan cooler AH-3 A-SA to STOP.

   h. Place the control switch for fan cooler AH-3 A-SA to HI-SPD.

NOTE: Steps 8.1.2.02.i and 8.1.2.02.j must be done without delay. The fan should not be allowed to coast down before being started in fast speed.

   i. Place the control switch for fan cooler AH-3 B-SA to STOP.

   j. Place the control switch for fan cooler AH-3 B-SA to HI-SPD.

   k. Verify CV-D5 is OPEN on Status Light Box 5.

   l. Verify CV-D7 is OPEN on Status Light Box 6.

NOTE: Performing the following steps will place both trains in service with all fans running in fast speed with nozzle dampers closed and discharging to the concrete air shaft.

3. If containment average temperature continues to rise or if additional cooling is desired, perform the following steps:

   a. Place the control switch for the spare fan cooler in AH-1 to LO-SPD.

NOTE: Steps 8.1.2.03.b and 8.1.2.03.c must be done without delay. The fan should not be allowed to coast down before being started in fast speed.

   b. Place the control switch for the fan started in Step 8.1.2.03.a to STOP.

   c. Place the control switch for the fan stopped in Step 8.1.2.03.b to HI-SPD.

8.1.2 Procedural Steps (continued)

d. Verify CV-D1 and CV-D7 are SHUT on Status Light Box 6.

e. Place the control switch for the spare fan cooler in AH-2 to LO-SPD.

NOTE: Steps 8.1.2.03.f and 8.1.2.03.g must be done without delay. The fan should not be allowed to coast down before being started in fast speed.

f. Place the control switch for the fan started in step 8.1.2.03.e to STOP.

g. Place the control switch for the fan stopped in Step 8.1.2.03.f to HI-SPD.

h. Verify CV-D3 and CV-D5 are SHUT on Status Light Box 5.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-B.1.g

Perform Control Rod Exercise Test

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Perform Control Rod Exercise Test

Alternate Path: Two shutdown bank rods drop while withdrawing to full withdrawn position.

Facility JPM #: NEW

K/A Rating: 003AA1.05 Importance: SRO NA RO 4.1

K/A Statement: Ability to operate and / or monitor the following as they apply to the Dropped Control Rod: Reactor power - turbine power

Task Standard: The reactor has been manually tripped in response to two dropped rods.

Preferred Evaluation Location: Simulator X In Plant ______

Preferred Evaluation Method: Perform X Simulate ______

References: OST-1005, Control Rod and Rod Position Indicator Exercise Quarterly Interval Modes 1 - 3
AOP-001, Malfunction of Rod Control and Indication System

Validation Time: 15 minutes Time Critical: NO

Candidate: ______________________________

Time Start: __________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________________

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OST-1005.
AOP-014.

SIMULATOR OPERATOR INSTRUCTIONS:
1) Initialize to a 100% power IC.
2) Enter malfunction to prevent auto opening of Reactor Trip Breakers <IMF RPS-01B 3 1>.
3) SEE INSTRUCTIONS AT STEP 5 TO ENTER ADDITIONAL MALFUNCTIONS.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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 plant is operting at 100% power.

OST-1005, Control Rod and Rod Position Indicator Exercise Quarterly Interval Modes 1 - 3, is being performed. A briefing has been conducted for the performance of Section 7.1.

INITIATING CUES:

You are to perform OST-1005, Section 7.1, commencing with Shutdown Bank A.

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates OST-1005 and refers to Section 7.1 NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 2: Records Shutdown Bank 'A' positions on Attachment 1 STANDARD: Records both Group Position indications as '228' and records all DRPI position indications as '228' NOTES: COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Selects Shutdown Bank 'A'	**CRITICAL STEP**
STANDARD:	Rotates the ROD BANK SELECTOR switch to the 'SB A' position	
NOTES:	***CRITICAL TO ALLOW MOVEMENT OF SHUTDOWN BANK 'A'.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Inserts Shutdown Bank 'A' rods	**CRITICAL STEP**
STANDARD:	Places the ROD MOTION lever in the 'IN' position and inserts Shutdown Bank 'A' rods 10 steps by observing Group Position indication	
NOTES:	***CRITICAL TO CAUSE SHUTDOWN BANK 'A' RODS TO MOVE INWARD.***	____ SAT
COMMENTS:		____ UNSAT

STEP 5: Records Shutdown Bank 'A' positions on Attachment 1

STANDARD: Records both Group Position indications as '218' and records all DRPI position indications as '216'

NOTES:

___ SAT

___ UNSAT

SIMULATOR OPERATOR INSTRUCTIONS: INSERT MALFUNCTIONS WHICH CAUSE 2 SHUTDOWN BANK 'A' RODS TO DROP INTO CORE AFTER RODS ARE WITHDRAWN 2-3 STEPS DURING THE PERFORMANCE OF THE FOLLOWING STEP <IMF CRF03A 2 J13 and IMF CRF03B 2 C7>.

COMMENTS:

STEP 6: Withdraws Shutdown Bank 'A' rods

CRITICAL STEP

STANDARD: Places the ROD MOTION lever in the 'OUT' position and withdraws Shutdown Bank 'A' rods 10 steps by observing Group Position indication

NOTES: ***CRITICAL TO CAUSE SHUTDOWN BANK 'A' RODS TO MOVE OUTWARD.***

___ SAT

___ UNSAT

COMMENTS:

STEP 7:	Determines 2 Shutdown Bank 'A' rods have dropped into the core	
STANDARD:	Determines 2 rods have dropped into the core by observing all / or some of the following: - Individual Rod Bottom Light on DRPI - Decreasing Reactor power - Decreasing Tavg - ALB-13-7-4, ONE ROD AT BOTTOM alarm - ALB-13-7-3, TWO OR MORE RODS AT BOTTOM alarm - ALB-13-7-1, ROD CONTROL URGENT ALARM alarm - ALB-13-4-2, POWER RANGE HIGH NEUTRON FLUX RATE ALERT alarm - ALB-12-4-3, REACTOR TRIP POWER RANGE HIGH FLUX RATE alarm - ALB-13-5-3, POWER RANGE UPPER DETECTOR HIGH FLUX DEV OR AUTO DEFEAT alarm - ALB-13-5-4, POWER RANGE LOWER DETECTOR HIGH FLUX DEV OR AUTO DEFEAT alarm - ALB-13-4-5, POWER RANGE CHANNEL DEVIATION alarm - ALB-13-8-5, COMPUTER ALARM ROD DEV/SEQ NIS PWR RANGE TILTS alarm	
NOTES:		____ SAT
COMMENTS:		____ UNSAT

STEP 8:	Informs the Unit SCO of the multiple dropped rods and manually trips the reactor	**CRITICAL STEP**
STANDARD:	Informs the Unit SCO and manually trips the reactor	
NOTES:	***CRITICAL TO MANUALLY TRIP THE REACTOR.*** ***NOTE: Immediate operator action for AOP-001. Additionally, tripped RPS bistables due to NEGATIVE RATE TRIP also require reactor trip.*** ***NOT critical to inform Unit SCO prior to tripping reactor.***	
		____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant is operting at 100% power.

OST-1005, Control Rod and Rod Position Indicator Exercise Quarterly Interval Modes 1 - 3, is being performed. A briefing has been conducted for the performance of Section 7.1.

INITIATING CUES:

You are to perform OST-1005, Section 7.1, commencing with Shutdown Bank A.

C
CONTINUOUS
USE

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT

UNIT 1

PLANT OPERATING MANUAL

VOLUME 3

PART 9

PROCEDURE TYPE: Operation Surveillance Test

NUMBER: OST-1005

TITLE: Control Rod and Rod Position
Indicator Exercise
Quarterly Interval
Modes 1 - 3

<u>NOTE</u>: This procedure has been screened per PLP-100 criteria and determined to be a CASE II procedure. This procedure requires Superintendent evaluation with concurrence of the Superintendent - Shift Operations as to level of management required to be involved in preparations and conduct of this test.

1.0 PURPOSE

This test verifies through freedom of movement the operability of each Control Rod Assembly, Control Rod Drive Mechanism and associated control circuit to satisfy Technical Specification Surveillance Requirement 4.1.3.1.2.

2.0 REFERENCES

2.1 Plant Operating Manual Procedures

1. OP-104
2. SD-104

2.2 Technical Specifications

1. 3.1.3.1
2. 3.1.3.5
3. 3.1.3.6
4. 4.1.3.1.2

2.3 Final Safety Analysis Report

1. 3.9.4
2. 4.6.3
3. 7.7.1

2.4 Technical Manuals

1. VM-PKO, Westinghouse Rod Control System Technical Manual
2. VM-PKP, Westinghouse Digital Rod Position Indication Technical Manual

3.0 PREREQUISITES

1. Review the Main Control Room Status File and verify that the Rod Control System is aligned in a manner that will support the performance of this test.

   ____

2. The performance of this OST has been coordinated with other plant evolutions such that the minimum equipment operating requirements of Tech Specs are met.

   ____

3. Both A and B data trains are available on DRPI for the Shutdown Banks.

   ____

4. Energize additional Pressurizer heaters as desired to help minimize pressure transients while rods are manipulated.

   ____

5. Instrumentation needed for the performance of this test is free of deficiency tags that affect instrument indication.

   ____

CAUTION

This procedure involves an infrequent test or evolution with the potential to reduce margins of safety or introduce transients or accidents or introduce personnel safety or radiological hazards if performed incorrectly.

---

6. A PLP-100 Shift brief has been performed by the applicable level of management.

   ____

7. Verify all prerequisites are met, then obtain the Superintendent - Shift Operations permission to perform this OST.

________________________ Signature   ____________ Date

4.0 PRECAUTIONS AND LIMITATIONS

NOTE: With DRPI operating at either full or half accuracy, rod movement of 10 steps should ensure a DRPI indication change of at least 6 steps.

1. When testing Rod Control Assemblies in Modes 1 - 3, do not exceed 12 steps movement on any non-controlling Rod Control Assembly.

2. Each rod bank is to be moved a minimum of 10 steps as indicated on the group step counters and 6 steps as indicated on DRPI.

3. This test should not be used for Post Maintenance testing unless the Post Maintenance test is being performed in conjunction with normal rod exercising per Tech Spec. 4.1.3.1.2 since Tech Specs 3.1.3.5 and 3.1.3.6 allow suspension of their requirements only during the rod exercise surveillance.

4. When exercising Control Rod Assemblies, the action requirements for Rod Insertion Limits and associated annunciators for Shutdown and Control Bank rods per Technical Specifications 3.1.3.5 and 3.1.3.6 do not apply.

5. All rods must be returned to the initial Group Step Counter positions to ensure rod insertion limits and proper bank overlap are restored. If Control Bank D is tested with Rod Bank Selector in AUTO or MAN, then Control Bank D does not have to be returned to the initial position but must be kept above rod insertion limits.

6. When withdrawing rods, ensure that any power limitations in effect are not exceeded.

7. Minimize the time the rods in each bank are out of their normal position.

8. When rods are being withdrawn, caution must be used to prevent the step counters from exceeding the full out position of the rods. If this occurs, the P/A converter for the affected bank (Control Banks only) may need to be reset to match actual rod position.

5.0 TOOLS AND EQUIPMENT

None Applicable

6.0 ACCEPTANCE CRITERIA

This test will be completed satisfactorily if all of the following conditions are verified.

1. Each rod moves at least 10 steps in any one direction as indicated on the group step counters and 6 steps as indicated on DRPI.

2. Each rod is returned to its pre-test position on both group step counters and DRPI, except when performing section 7.3.

3. The individual rod positions as indicated by the DRPI are in agreement with the step counters within plus or minus 12 steps.

7.0 PROCEDURE

NOTE:
- If in Mode 1, testing of Control Bank D can be conducted during lowering of plant power per Section 7.3.
- If Control Bank D is less than 10 steps, then testing of Control Bank D rods can be conducted per Section 7.2.

7.1 Shutdown and Control Bank Testing

1. Refer to Attachment 1 and test all rod banks listed per the following instructions:

NOTE: Substeps 7.1.0.0.1.a through 7.1.0.0.1.g are to be signed off when testing of the components listed in Attachment 1 is completed.

a. For the rod bank being tested, record on Attachment 1 the rod heights as indicated by Group Step Counters and DRPI.

____

b. Rotate the Rod Bank Selector to the bank being tested.

____

NOTE: When inserting rods, the Bank Low Insertion and Bank Low-Low Insertion Limit Alarm may be actuated.

c. With the Rod Motion lever, drive the rod bank being tested IN 10 steps as indicated by Group Step Counters.

____

d. Record on Attachment 1, the rod heights for the bank being tested, as indicated by Group Step Counters and DRPI.

____

CAUTION

When withdrawing rods, ensure that any power limits in effect are not exceeded.

---

e. With the Rod Motion lever, pull the rod bank being tested OUT 10 steps as indicated by Group Step Counters.

____

f. Record on Attachment 1, the rod height for the bank being tested, as indicated by Group Step Counters and DRPI.

____

g. Repeat Substeps 7.1.0.0.1.a through 7.1.0.0.1.f of above for all remaining rod banks to be tested.

____

2. Review and ensure all Group Step Counter and DRPI positions recorded on Attachment 1 per Substep 7.1.0.0.1.f match the positions recorded in Substep 7.1.0.0.1.a.

____

7.2 Control Bank D Testing When Less Than 10 Steps

NOTE: This section can be marked N/A if not performed.

1. Refer to Attachment 1 and test Control Bank D per the following:

a. Record on Attachment 1 the rod heights of Control Bank D as indicated by Group Step Counters and DRPI.

____

b. Rotate the Rod Bank Selector to CBD.

____

CAUTION

When withdrawing rods, ensure that any power limits in effect are not exceeded.

---

c. With the Rod Motion lever, pull Control Bank D OUT 10 steps as indicated by Group Step Counters.

____

7.2 Control Bank D Testing When Less Than 10 Steps (continued)

d. Record on Attachment 1 the rod heights of Control Bank D as indicated by Group Step Counters and DRPI.

____

e. With the Rod Motion lever, drive Control Bank D IN 10 steps as indicated by Group Step Counters.

____

f. Record on Attachment 1 the rod heights of Control Bank D as indicated by Group Step Counters and DRPI.

____

2. Review and ensure Control Bank D Group Step Counter and DRPI positions recorded on Attachment 1 Substep 7.2.0.0.1.f match the positions recorded in Substep 7.2.0.0.1.a.

____

7.3 Control Bank D Testing When Lowering Plant Power

NOTE: This section can be marked N/A if not performed.

1. Refer to Attachment 1 and test Control Bank D per the following:

a. Record on Attachment 1 the rod heights of Control Bank D as indicated by Group Step Counters and DRPI.

____

b. As power is reduced verify that Control Bank D rods are inserted either automatically or manually.

____

c. When Control Bank D is inserted at least 10 Steps, record on Attachment 1 the rod heights of Control Bank D as indicated by Group Step Counters and DRPI.

____

7.4 Test Completion

1. Verify the Rod Bank Selector is in AUTO or MAN as required by plant conditions. ________

2. R Review all data taken on Attachment 1 and verify all acceptance criteria in Section 6.0 has been met. (Reference 2.3.0.0.3). ________

3. Document Task O S QN 077 completion. ________

4. Complete applicable sections of Attachment 2, Certifications and Reviews, and inform the Unit SCO when this OST is completed. ________

8.0 DIAGRAMS/ATTACHMENTS

Attachment 1 - Data Sheet

Attachment 2 - Certifications and Reviews.

Data Sheet

SHUTDOWN BANK A										
Section 7.1 Step	Step Counters		DRPI							
	SC-SBA1	SC-SBA2	G3	C9	J13	N7	J3	C7	G13	N9
7.1.0.0.1.a										
7.1.0.0.1.d										
7.1.0.0.1.f										

SHUTDOWN BANK B										
Section 7.1 Step	Step Counters		DRPI							
	SC-SBB1	SC-SBB2	E5	E11	L11	L5	G7	G9	J9	J7
7.1.0.0.1.a										
7.1.0.0.1.d										
7.1.0.0.1.f										

SHUTDOWN BANK C					
Section 7.1 Step	Step Counters	DRPI			
	SC-SBC1	E3	C11	L13	N5
7.1.0.0.1.a					
7.1.0.0.1.d					
7.1.0.0.1.f					

Data Sheet

CONTROL BANK A										
Section 7.1 Step	Step Counters		DRPI							
	SC-CBA1	SC-CBA2	F2	B10	K14	P6	K2	B6	F14	P10
7.1.0.0.1.a										
7.1.0.0.1.d										
7.1.0.0.1.f										

CONTROL BANK B										
Section 7.1 Step	Step Counters		DRPI							
	SC-CBB1	SC-CBB2	F4	D10	K12	M6	K4	D6	F12	M10
7.1.0.0.1.a										
7.1.0.0.1.d										
7.1.0.0.1.f										

CONTROL BANK C										
Section 7.1 Step	Step Counters		DRPI							
	SC-CBC1	SC-CBC2	D4	D12	M12	M4	H6	F8	H10	K8
7.1.0.0.1.a										
7.1.0.0.1.d										
7.1.0.0.1.f										

Data Sheet

CONTROL BANK D										
Section 7.1 Step	Step Counters		DRPI							
	SC-CBD1	SC-CBD2	H2	B8	H14	P8	F6	F10	K10	K6
7.1.0.0.1.a										
7.1.0.0.1.d										
7.1.0.0.1.f										

OR

CONTROL BANK D										
Section 7.2 Step	Step Counters		DRPI							
	SC-CBD1	SC-CBD2	H2	B8	H14	P8	F6	F10	K10	K6
7.2.0.0.1.a										
7.2.0.0.1.d										
7.2.0.0.1.f										

OR

CONTROL BANK D										
Section 7.3 Step	Step Counters		DRPI							
	SC-CBD1	SC-CBD2	H2	B8	H14	P8	F6	F10	K10	K6
7.3.0.0.1.a										
7.3.0.0.1.c										

Certifications and Reviews

This OST was performed as a:

Periodic Surveillance Requirement: ________
Postmaintenance Operability Test: ________
Redundant Subsystem Test: ________

Plant Conditions: ______________________________ Mode: ________

OST Completed By: ______________________________ Date: __________
Time: __________

OST Performed By:

Initials	Name (Print)	Initials	Name (Print)

General Comments/Recommendations/Corrective Actions/Exceptions:

____
____
____
____
____

Pages Used: ______________________________

OST Completed with NO EXCEPTIONS/EXCEPTIONS:

______________________________ Date: __________
Unit SCO

Reviewed By: ______________________________ Date: __________
Superintendent - Shift Operations

After receiving the final review signature, this OST becomes a QA RECORD and should be submitted to Document Services.

Revision Summary

General

Changes procedure from monthly performance to quarterly performance per TS Amendment 93 changes. Other editorial changes.

Description of Changes

Page	Section	Change Description
All		Updated revision level.
1		Adds continuous use header. Removes continuous use box from title page. Changes title from monthly to quarterly per TS Amendment 93.
8	7.4.3	Changed task number from O S MN 031 (monthly) to O S QN 077 (quarterly) per TS Amendment 93 changes.

Section 4.0

1.0 SYMPTOMS

1. Individual Rod Bottom Light on DRPI
2. Decreasing Reactor power
3. Decreasing Tavg
4. ALB-13-7-4, ONE ROD AT BOTTOM alarm
5. ALB-13-7-3, TWO OR MORE RODS AT BOTTOM alarm
6. ALB-13-7-1, ROD CONTROL URGENT ALARM alarm
7. ALB-13-4-2, POWER RANGE HIGH NEUTRON FLUX RATE ALERT alarm
8. ALB-12-4-3, REACTOR TRIP POWER RANGE HIGH FLUX RATE alarm
9. ALB-13-5-3, POWER RANGE UPPER DETECTOR HIGH FLUX DEV OR AUTO DEFEAT alarm
10. ALB-13-5-4, POWER RANGE LOWER DETECTOR HIGH FLUX DEV OR AUTO DEFEAT alarm
11. ALB-13-4-5, POWER RANGE CHANNEL DEVIATION alarm
12. ALB-13-8-5, COMPUTER ALARM ROD DEV/SEQ NIS PWR RANGE TILTS alarm

2.0 AUTOMATIC ACTIONS

1. Reactor trip will occur if negative rate trip is actuated by two or more power range NI channels.

NOTE: If a dropped rod is in the controlling bank, a Rod Control Urgent alarm may be received and automatic rod motion may be blocked.

2. IF Rod Control is in automatic, THEN the rods will be withdrawn to restore Tavg to Tref.

3.0 OPERATOR ACTIONS

3.1 Immediate Actions

1. IF two or more Control Rods have dropped, THEN trip the Reactor and Go To EOP-PATH-1.
2. Position the Rod Bank Selector Switch to MAN.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM COM-B.2.a

Locally Reset the Turbine Driven Auxiliary Feed Pump

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Locally Reset the Turbine Driven Auxiliary Feed Pump

Alternate Path: NONE

Facility JPM #: IP-001

K/A Rating: WE05EA1.1 Importance: SRO 4.0 RO 4.1

K/A Statement: Ability to operate and / or monitor the following as they apply to the Loss of Secondary Heat Sink: Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.

Task Standard: The TURBINE OVERSPEED TRIP light is extinguished on the AFW Control Panel 1X-SAB.

Preferred Evaluation Location: Simulator ______ In Plant X

Preferred Evaluation Method: Perform ______ Simulate X

References: OP-137, Auxiliary Feedwater System

Validation Time: 10 minutes Time Critical: NO

Candidate: ____________________

Time Start: __________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ____________________

____

Examiner: ____________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OP-137 or Wall-mounted operator aid.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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.

DO NOT operate actual plant equipment unless specifically authorized to do so. Follow standard ALARA practices in the RCA. The TDAFW pump may start at any time.

INITIAL CONDITIONS:

The unit has tripped from 100 percent power. The turbine-driven AFW pump has tripped on overspeed and is needed for plant cooldown. The cause of the overspeed trip has been identified and corrected.

1MS-70 and 1MS-72 are shut.

INITIATING CUES:

You are to reset the turbine-driven AFW pump mechanical overspeed trip linkage.

The Trip and Throttle Valve will be reopened from the Control Room.

START TIME: ________

STEP 1: Locates proper procedure and required information. STANDARD: Locates OP-137, Section 8.4, or refers to wall-mounted operator aid NOTES: COMMENTS:	____ SAT ____ UNSAT
STEP 2: Verify the flat side of the tappet nut is aligned toward the tappet lever STANDARD: Verify the flat side of the tappet nut is aligned toward the tappet lever NOTES: ***CUE: The flat side of the tappet nut is aligned toward the tappet lever.*** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Pull the connecting rod toward the Trip and Throttle valve until the rod locks in place	**CRITICAL STEP**
STANDARD:	Pulls the connecting rod toward the Trip and Throttle valve until the rod locks in place	
NOTES:	***CRITICAL TO ALLOW OPENING THE VALVE.*** ***CUE: The connecting rod is locked in place.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Verify the Trip and Throttle valve operator in the shut position	
STANDARD:	Verifies the Trip and Throttle valve operator in the shut position by observing the T & T VALVE OPERATOR CLOSED light on the Aux Feedwater Control Panel 1X-SAB	
NOTES:	***CUE: The T & T Valve Operator light indication on panel 1X-SAB is RED light OFF and GREEN light ON.***	____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Verify the flat side of the tappet nut is against the tappet lever	
STANDARD:	Verifies the flat side of the tappet nut is against the tappet lever	
NOTES:	***CUE: The flat side of the tappet nut is against the tappet lever.***	____ SAT
COMMENTS:		____ UNSAT
STEP 6:	Verify the latch lever is being held up by the trip hook	
STANDARD:	Verifies the latch lever is being held up by the trip hook	
NOTES:	***CUE: The latch lever is being held up by the trip hook.***	____ SAT
COMMENTS:		____ UNSAT

STEP 7:	Verify the Turbine Overspeed Trip is reset	
STANDARD:	Verifies the TURBINE OVERSPEED TRIP light is extinguished on the AFW Control Panel 1X-SAB.	
NOTES:	***CUE: The Turbine Overspeed Trip light is OFF on panel 1X-SAB.***	____ SAT ____ UNSAT
COMMENTS:		
STEP 8:	Inform the control room that the valve has been reset	
STANDARD:	Informs the control room	
NOTES:	***CUE: The control acknowledges the report.***	____ SAT ____ UNSAT
COMMENTS:		
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The unit has tripped from 100 percent power. The turbine-driven AFW pump has tripped on overspeed and is needed for plant cooldown. The cause of the overspeed trip has been identified and corrected.

1MS-70 and 1MS-72 are shut.

INITIATING CUES:

You are to reset the turbine-driven AFW pump mechanical overspeed trip linkage.

The Trip and Throttle Valve will be reopened from the Control Room.

DO NOT operate actual plant equipment unless specifically authorized to do so. Follow standard ALARA practices in the RCA. The TDAFW pump may start at any time.

8.4 Resetting the Turbine-Driven AFW Pump Mechanical Over Speed Trip Linkage

8.4.1 Initial Conditions

1. Mechanical Over speed Trip Linkage in the tripped position.

2. During normal operations, the cause of any over speed trip of the turbine-driven AFW pump has been investigated and corrected prior to resuming the operation of the pump.

8.4.2 Procedural Steps

NOTE:
- Attachment 6 diagram may be used as a reference for nomenclature.
- If any of the following information is changed, Attachment 6 and local pump information should also be changed.

1. Verify shut 1MS-70 and 1MS-72.

2. Verify the flat side of the tappet nut is aligned toward the tappet lever.

3. Pull the connecting rod toward the Trip and Throttle valve until the rod locks in place.

4. Verify the Trip and Throttle valve operator in the shut position by observing the T & T VALVE OPERATOR CLOSED light on the Aux Feedwater Control Panel 1X-SAB.

5. Verify the flat side of the tappet nut is against the tappet lever.

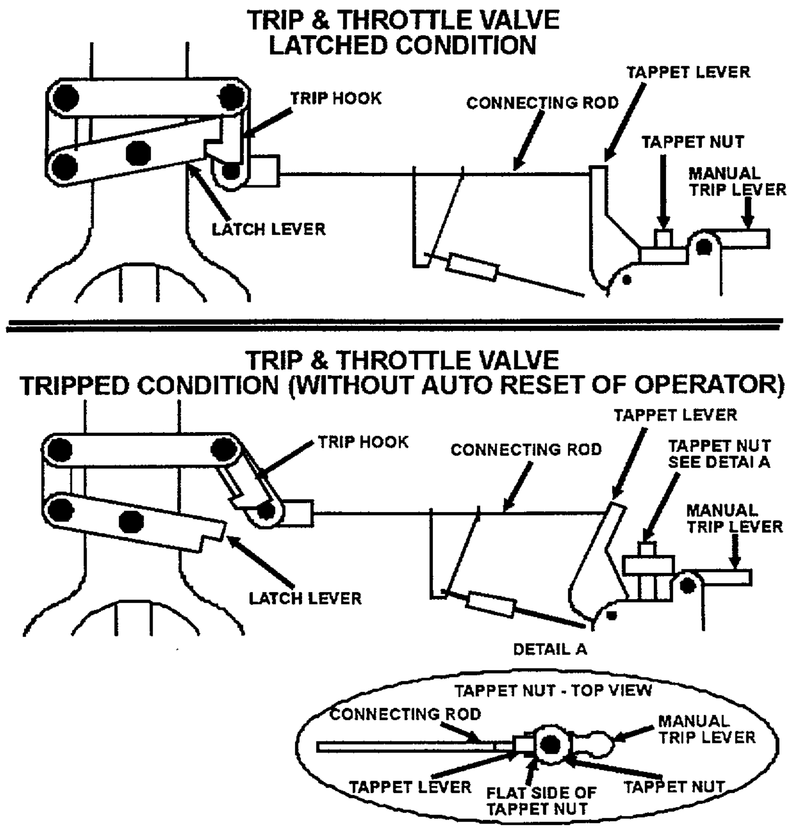
6. Verify the latch lever is being held up by the trip hook.

7. Verify the TURBINE OVERSPEED TRIP light is extinguished on the AFW Control Panel 1X-SAB.

8. Open the Trip and Throttle valve from the MCB.

9. If TDAFW pump operation is desired, go to Section 5.5.

Resetting the TDAFW Pump Mechanical Overspeed Trip Linkage



1. Verify shut 1MS-70 and 1MS-72.

2. Verify the flat side of the tappet nut is aligned towards the tappet lever.

3. Pull the connecting rod toward the Trip and Throttle valve until the rod locks in place.

4. Verify the Trip and Throttle valve operator in the shut position by observing the T & T VALVE OPERATOR CLOSED light on the Aux Feedwater Control Panel 1X-SAB.

5. Verify the flat side of the tappet nut is against the tappet lever

6. Verify the latch lever is being held up by the trip hook.

6. Verify the TURBINE OVERSPEED TRIP light is extinguished on the Aux Feedwater Control Panel 1X-SAB.

NOTE: If any of the above information is changed, also change Section 8.4 and local pump information.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM COM-B.2.b

Emergency Makeup to the Spent Fuel Pool

CANDIDATE: ______________________________

EXAMINER: ______________________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Emergency Makeup to the Spent Fuel Pool

Alternate Path: Makeup valve from Train 'B' ESW fails to open.

Facility JPM #: IP-137A (Modified)

K/A Rating: 033A2.03 Importance: SRO 3.5 RO 3.1

K/A Statement: Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System; and (b) based on these predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Abnormal spent fuel pool water level or loss of water level

Task Standard: Emergency makeup is established to the Spent Fuel Pool.

Preferred Evaluation Location: Simulator ______ In Plant X

Preferred Evaluation Method: Perform ______ Simulate X

References: OP-116, Fuel Pool Cooling and Cleanup

Validation Time: 20 minutes Time Critical: NO

Candidate: ______________________________

Time Start: __________ Time Finish: ______

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ______________________________

____

Examiner: ______________________________ Date: ______
Signature

Tools/Equipment/Procedures Needed:

OP-116.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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.

DO NOT operate actual plant equipment unless specifically authorized to do so. Follow standard ALARA practices in the RCA.

INITIAL CONDITIONS:

The plant is in mode 6 with the core offloaded. Fuel Pool Cooling is shutdown per Section 7.1 of OP-116.

A leak has developed in the Unit 1 Spent Fuel Pool. Gates 3 and 4 are open.

The ONLY available source of Fuel Pool Makeup is ESW. Both trains of ESW are available for emergency makeup.

INITIATING CUES:

You are to fill the Unit 1 SFP from ESW using OP-116, Section 8.13.

START TIME: ________

STEP 1: Locates proper procedure and required materials. STANDARD: Locates OP-116, Section 8.13, and gangbox located in the 236 RAB at the entrance to the 216 Pipe Tunnel area which contains all required materials NOTES: ***CUE: For the purposes of this JPM, the location of the needed items is sufficient. DO NOT remove hoses and couplings from storage location. Jumper connection will be simulated.*** COMMENTS:	____ SAT ____ UNSAT
STEP 2: Verify shut 1CT-23, RWST to SFP Pump Suction STANDARD: Verifies 1CT-23 shut by turning handwheel in clockwise direction with no movement of handwheel NOTES: ***CUE: Handwheel is not moving.*** COMMENTS:	____ SAT ____ UNSAT

STEP 3:	Connect jumper to Designated SFPCCS Emerg Makeup Conn Vent Vlv, 1SF-76	**CRITICAL STEP**
STANDARD:	Connects jumper to 1SF-76 (located downstream of 1CT-23)	
NOTES:	***CRITICAL TO ESTABLISH FLOW PATH FROM ESW TO SFP.*** ***CUE: Hose is connected to vent pipe.*** **NOTE TO EVALUATOR: IF CANDIDATE NEXT CONNECTS JUMPER TO 1SW-1239 (TRAIN 'B' ESW) CONTINUE WITH NEXT JPM STEP AND MARK JPM STEPS 11 THROUGH 17 (PAGES 10 - 13) "N/A". IF CANDIDATE CHOOSES TO CONNECT JUMPER TO 1SW-269 (TRAIN 'A' ESW), MARK JPM STEPS 4 THROUGH 10 (PAGES 6 - 9) "N/A" AND CONTINUE WITH JPM AT STEP 11 (PAGE 10).**	____ SAT ____ UNSAT
COMMENTS:		

STEP 4:	Connect jumper to 1SW-1239, DG 1B SW Return Hdr SFCW Emerg M/U Conn	
STANDARD:	Connects jumper to 1SW-1239 (located on Diesel Generator 1B ESW return line in 236 RAB)	
NOTES:	***CUE: Hose is connected to vent line.***	
COMMENTS:		____ SAT ____ UNSAT ____ N/A
STEP 5:	Open 1SF-10, RWST to A Supply Isolation	**CRITICAL STEP**
STANDARD:	Opens 1SF-10 by rotating handwheel in counterclockwise direction and verifies movement	
NOTES:	***CRITICAL TO ESTABLISH FLOW PATH FROM ESW TO SFP.*** ***CUE: Handwheel has rotated in counterclockwise direction and will move no further.***	
COMMENTS:		____ SAT ____ UNSAT ____ N/A

STEP 6:	Attempts to open 1SW-1239, DG 1B SW Return Hdr SFCW Emerg M/U Conn	
STANDARD:	Attempts to rotate handwheel for 1SW-1239 in counterclockwise direction	
NOTES:	***CUE: Valve handwheel will NOT move.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A
STEP 7:	Determines Train 'B' ESW cannot be used and informs control room	
STANDARD:	Notifies control room	
NOTES:	***CONDITIONAL CUE (only to be given if candidate requests directions from control room): Control room acknowledges report and informs candidate to establish makeup using other train of ESW.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 8:	Connect jumper to 1SW-269, DG 1A SW Return Hdr SFCW Emerg M/U Backup Conn	**CRITICAL STEP**
STANDARD:	Connects jumper to 1SW-269 (located on Diesel Generator 1A ESW return line in 236 RAB)	
NOTES:	***CRITICAL TO ESTABLISH FLOW PATH FROM ESW TO SFP.*** ***CUE: Hose is connected to vent line.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A
STEP 9:	Open 1SW-269, DG 1A SW Return Hdr SFCW Emerg M/U Backup Conn	**CRITICAL STEP**
STANDARD:	Opens 1SW-269 by rotating handwheel in counterclockwise direction and verifies movement	
NOTES:	***CRITICAL TO ESTABLISH FLOW PATH FROM ESW TO SFP.*** ***CUE: Handwheel has rotated in counterclockwise direction and will move no further.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 10:	Informs control room that Train 'A' of ESW is inoperable due to valve being open	
STANDARD:	Informs control room	
NOTES:	***CUE: Control room acknowledges report.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 11:	Connect jumper to 1SW-269, DG 1A SW Return Hdr SFCW Emerg M/U Backup Conn	
STANDARD:	Connects jumper to 1SW-269 (located on Diesel Generator 1A ESW return line in 236 RAB)	
NOTES:	***CUE: Hose is connected to vent line.*** ***NOTE: Candidate may notify WCC or Control Room that a fire door is blocked open by installation of this jumper.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A
STEP 12:	Open 1SF-10, RWST to A Supply Isolation	**CRITICAL STEP**
STANDARD:	Opens 1SF-10 by rotating handwheel in counterclockwise direction and verifies movement	
NOTES:	***CRITICAL TO ESTABLISH FLOW PATH FROM ESW TO SFP.*** ***CUE: Handwheel has rotated in counterclockwise direction and will move no further.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 13:	Attempts to open 1SW-269, DG 1A SW Return Hdr SFCW Emerg M/U Backup Conn	
STANDARD:	Attempts to rotate handwheel for 1SW-269 in counterclockwise direction	
NOTES:	***CUE: Valve handwheel will NOT move.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A
STEP 14:	Determines Train 'A' ESW cannot be used and informs control room	
STANDARD:	Notifies control room	
NOTES:	***CONDITIONAL CUE (only to be given if candidate requests directions from control room): Control room acknowledges report and informs candidate to establish makeup using other train of ESW.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 15:	Connect jumper to 1SW-1239, DG 1B SW Return Hdr SFCW Emerg M/U Conn	**CRITICAL STEP**
STANDARD:	Connects jumper to 1SW-1239 (located on Diesel Generator 1B ESW return line in 236 RAB)	
NOTES:	***CRITICAL TO ESTABLISH FLOW PATH FROM ESW TO SFP.*** ***CUE: Hose is connected to vent line.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A
STEP 16:	Open 1SW-1239, DG 1B SW Return Hdr SFCW Emerg M/U Conn	**CRITICAL STEP**
STANDARD:	Opens 1SW-1239 by rotating handwheel in counterclockwise direction and verifies movement	
NOTES:	***CRITICAL TO ESTABLISH FLOW PATH FROM ESW TO SFP.*** ***CUE: Handwheel has rotated in counterclockwise direction and will move no further.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 17:	Informs control room that Train 'A' of ESW is inoperable due to valve being open	
STANDARD:	Informs control room	
NOTES:	***CUE: Control room acknowledges report.***	____ SAT
COMMENTS:		____ UNSAT ____ N/A

STEP 18:	While closely monitoring fuel pool levels, open 1SF-76, SFPCCS Emerg Makeup Conn Vent Vlv	**CRITICAL STEP**
STANDARD:	Opens 1SF-76 by rotating handwheel in counterclockwise direction and verifies movement	
NOTES:	***CRITICAL TO ESTABLISH FLOW PATH FROM ESW TO SFP.*** ***CUE: Handwheel has rotated in counterclockwise direction and will move no further.***	____ SAT
COMMENTS:		____ UNSAT
STEP 19:	Informs control room that emergency makeup has been established from Train 'A' ESW to the SFP	
STANDARD:	Informs control room	
NOTES:	***CUE: Control room acknowledges report.***	____ SAT
COMMENTS:		____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

The plant is in mode 6 with the core offloaded. Fuel Pool Cooling is shutdown per Section 7.1 of OP-116.

A leak has developed in the Unit 1 Spent Fuel Pool. Gates 3 and 4 are open.

The ONLY available source of Fuel Pool Makeup is ESW. Both trains of ESW are available for emergency makeup.

INITIATING CUES:

You are to fill the Unit 1 SFP from ESW using OP-116, Section 8.13.

DO NOT operate actual plant equipment unless specifically authorized to do so. Follow standard ALARA practices in the RCA.

8.13 Emergency Makeup to Fuel Pools from ESW

8.13.1 Initial Conditions

NOTE: This Section provides emergency makeup water to both NFP A and SFP B with gates #3 and #4 removed.

1. RWST is not available for Fuel Pool makeup.

2. Demineralized Water is not available for Fuel Pool makeup.

3. Fuel Pool Cooling shutdown per Section 7.1.

NOTE: The gang box located in the 236 RAB at the entrance to the 216 Pipe Tunnel area should contain all necessary hoses and couplings.

CAUTION

A backflow preventer should be used to prevent possible contamination to the ESW System.

---

4. Approximately 50 feet of 1 inch rubber hose and 1 inch threaded couplings have been obtained to be used as a jumper between two vent lines.

NOTE: Since the ESW System uses raw water with high chloride content, it should only be used in an extreme emergency.

8.13.2 Procedural Steps

1. Verify shut 1CT-23, RWST to SFP Pump Suction.

NOTE: If Train B of ESW is out of service, the connection at 1SW-269 (located on Diesel Generator 1A ESW return line in 236 RAB) may be used instead of the connection at valve 1SW-1239.

2. Connect jumper between Designated SFPCCS Emerg Makeup Conn Vent Vlv, 1SF-76 (located downstream of 1CT-23) and valve 1SW-1239 (located on Diesel Generator 1B ESW return line in 236 RAB).

3. Open 1SF-10, RWST to A Supply Isolation.

NOTE: B Train (A Train) ESW will be inoperable whenever 1SW-1239 (1SW-269) is opened.

4. While closely monitoring fuel pool levels, open the following valves:

   a. 1SW-1239, DG 1B SW Return Hdr SFCW Emerg M/U Conn, or 1SW-269, DG 1A SW Return Hdr SFCW Emerg M/U Backup Conn

   and

   b. 1SF-76, SFPCCS Emerg Makeup Conn Vent Vlv

5. When desired level is being maintained in the Fuel Pools, shut 1SF-76 and 1SW-1239(or 1SW-269).

6. Shut 1SF-10, RWST to A Supply Isolation.

7. Complete Attachment 17.

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM RO-B.2.c

Inhibit Both Trains of SSPS

CANDIDATE: ______________________

EXAMINER: ______________________

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task: Inhibit Both Trains of SSPS

Alternate Path: NONE

Facility JPM #: IP-141

K/A Rating: 012A4.05 Importance: SRO NA RO 3.6

K/A Statement: Ability to operate and / or monitor in the control room: Channel defeat controls

Task Standard: All fuses listed in Attachment 1 of AOP-036 have been removed.

Preferred Evaluation Location: Simulator ______ In Plant X

Preferred Evaluation Method: Perform ______ Simulate X

References: AOP-036, Safe Shutdown Following a Fire

Validation Time: 10 minutes Time Critical: NO

Candidate: ______________________________

Time Start: ________ Time Finish: ________

Performance Time: ______ minutes

Performance Rating: SAT ______ UNSAT ______

Comments: ____

____

Examiner: ____________________________ Date: ________
Signature

Tools/Equipment/Procedures Needed:

AOP-036, Attachment 1.
SSPS Cabinet Key.

READ TO OPERATOR

DIRECTION TO CANDIDATE:

I will explain the initial conditions, and state the task to be performed. All control room steps shall be performed for this JPM, including any required communications. I will provide initiating cues and reports on other actions when directed by you. 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.

DO NOT operate actual plant equipment unless specifically authorized to do so. Follow standard ALARA practices in the RCA.

INITIAL CONDITIONS:

A major fire has occurred on RAB 286' in the Cable Spread Room 'A'.

INITIATING CUES:

You are to inhibit both trains of SSPS per AOP-036, Attachment 1, page 23 of 46, Step 7.

START TIME: ________

STEP 1:	Locates proper procedure and required information.	
STANDARD:	Locates AOP-036, Attachment 1, and obtains SSPS Cabinet Key 96	
NOTES:		____ SAT
COMMENTS:	TRAIN A, OUTPUT CABINET NO. 2, fuses 61 and 62 TRAIN B, OUTPUT CABINET NO. 1, OUTPUT RELAY POWER fuses TRAIN B, OUTPUT CABINET NO. 2, fuses 61 and 62	____ UNSAT
STEP 2:	Removes Train 'A' Output Relay Power fuses	**CRITICAL STEP**
STANDARD:	Opens Train 'A' cabinet 1 and removes TRAIN A, OUTPUT CABINET NO. 1, OUTPUT RELAY POWER fuses	
NOTES:	***CRITICAL TO DISABLE SSPS TRAIN 'A'.*** ***CUE: Fuses have been removed.*** ***NOTE: Steps 2 through 7 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT

STEP 3:	Removes Train 'A' fuse 61	**CRITICAL STEP**
STANDARD:	Opens Train 'A' cabinet 2 and removes TRAIN A, OUTPUT CABINET NO. 2, fuse 61	
NOTES:	***CRITICAL TO DISABLE SSPS TRAIN 'A'.*** ***CUE: Fuses has been removed.*** ***NOTE: Steps 2 through 7 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT
STEP 4:	Removes Train 'A' fuse 62	**CRITICAL STEP**
STANDARD:	Opens Train 'A' cabinet 2 and removes TRAIN A, OUTPUT CABINET NO. 2, fuse 62	
NOTES:	***CRITICAL TO DISABLE SSPS TRAIN 'A'.*** ***CUE: Fuses has been removed.*** ***NOTE: Steps 2 through 7 may be performed in any order.***	____ SAT
COMMENTS:		____ UNSAT

STEP 5:	Removes Train 'B' Output Relay Power fuses	**CRITICAL STEP**
STANDARD:	Opens Train 'B' cabinet 1 and removes TRAIN B, OUTPUT CABINET NO. 1, OUTPUT RELAY POWER fuses	
NOTES:	***CRITICAL TO DISABLE SSPS TRAIN 'B'.*** ***CUE: Fuses have been removed.*** ***NOTE: Steps 2 through 7 may be performed in any order.***	____ SAT ____ UNSAT
COMMENTS:		

STEP 6:	Removes Train 'B' fuse 61	**CRITICAL STEP**
STANDARD:	Opens Train 'B' cabinet 2 and removes TRAIN B, OUTPUT CABINET NO. 2, fuse 61	
NOTES:	***CRITICAL TO DISABLE SSPS TRAIN 'B'.*** ***CUE: Fuses has been removed.*** ***NOTE: Steps 2 through 7 may be performed in any order.***	____ SAT ____ UNSAT
COMMENTS:		

		CRITICAL STEP
STEP 7:	Removes Train 'B' fuse 62	
STANDARD:	Opens Train 'B' cabinet 2 and removes TRAIN B, OUTPUT CABINET NO. 2, fuse 62	
NOTES:	***CRITICAL TO DISABLE SSPS TRAIN 'B'.*** ***CUE: Fuses has been removed.*** ***NOTE: Steps 2 through 7 may be performed in any order.***	_____ SAT
COMMENTS:		_____ UNSAT
STEP 8:	Informs control room that both trains of SSPS have been inhibited	
STANDARD:	Informs control room	
NOTES:	***CUE: Control room acknowledges report.***	_____ SAT
COMMENTS:		_____ UNSAT
	END OF TASK	

STOP TIME: ________

CANDIDATE CUE SHEET
(TO BE RETURNED TO EXAMINER UPON COMPLETION OF TASK)

INITIAL CONDITIONS:

A major fire has occurred on RAB 286' in the Cable Spread Room 'A'.

INITIATING CUES:

You are to inhibit both trains of SSPS per AOP-036, Attachment 1, page 23 of 46, Step 7.

DO NOT operate actual plant equipment unless specifically authorized to do so. Follow standard ALARA practices in the RCA.

Safe Shutdown Emergency Manual Operations

FIRE AREA: 1-A-CSRA (continued)

CAUTION

- The following step will inhibit all automatic and manual safeguards functions since a fire in this area could cause spurious actuations as well as disable controls for resetting SI.
- Removal of Output Relay Power Fuses from both trains of SSPS will generate a Reactor Trip Signal. The Reactor should be shutdown prior to performing the following step.

---

7. Obtain SSPS Key 96 and inhibit both trains of SSPS by removing the listed fuses in the front of the listed SSPS OUTPUT CABINETS.

   - TRAIN A, OUTPUT CABINET NO. 1, OUTPUT RELAY POWER fuses
   - TRAIN A, OUTPUT CABINET NO. 2, fuses 61 and 62

   - TRAIN B, OUTPUT CABINET NO. 1, OUTPUT RELAY POWER fuses
   - TRAIN B, OUTPUT CABINET NO. 2, fuses 61 and 62

8. If SI spuriously actuates, perform the following:

   a. Go to EOP-PATH-1 and reference this procedure for plant cooldown.

   b. If SI reset controls are disabled, de-energize and locally manipulate BIT outlet valves and charging line isolation valves as indicated below OR coordinate breaker operation with manipulation of control switches.

1SI-3	:	BORON INJECTION TANK OUTLET	SHUT
PS	:	1B31-SB-4C	
Loc	:	RAB 216 Penetration Area	
1SI-4	:	BORON INJECTION TANK OUTLET	SHUT
PS	:	1A31-SA-4C	
Loc	:	RAB 216 Penetration Area	
1CS-235	:	CHARGING LINE ISOLATION	OPEN
PS	:	1B31-SB-10A	
Loc	:	RAB 236 Penetration Area	
1CS-238	:	CHARGING LINE ISOLATION	OPEN
PS	:	1A31-SA-10A	
Loc	:	RAB 236 Penetration Area	

9. Perform the following to ensure adequate cooling to Electrical Equipment Protection Rooms:

   a. Align B train Electrical Equipment Protection Rooms Ventilation for service per OP-172.

   b. At AEP-001, verify open CZ-D74 SB, RAB ELEC EQUIP ROOM RETURN DAMPER.

Facility: **SHNPP** Scenario Number: 1 Op-Test Number: 2000-301

Examiners

Operators
(S-1)
(R-1)
(R-2)

Objectives: To evaluate the candidate's ability to shutdown the HDPs. To evaluate the candidates' ability to respond to a SG level channel failure, a pressurizer pressure high failure with a subsequent failure of a pressurizer PORV to reseat, and a trip of the running condenser vacuum pump. During the required power reduction, the candidates will be evaluated on their ability to control reactivity. The candidates will be evaluated on their ability to diagnose and respond to a SGTR. Following the plant trip, the candidates will be required to respond to a failure of the turbine to trip when required. Post-trip complications will also include a failed open safety valve on the ruptured SG.

Initial Conditions: IC-6, 38% power BOL; Equipment OOS is RHR Pump 1B-SB.

Turnover: Power is 38% at BOL. Core burnup is 52 EFPD.

RHR Pump 1B-SB has been out of service for 64 hours and is not expected to be available within the next 8 hours. Technical Specification action 3.5.2.a has been entered and a shutdown at 5 MW/min is being performed to meet Technical Specifications.

Boron concentration is 1230 ppm. Bank D rods are at 152 steps.

Shift orders are to continue the power power reduction and be prepared to perfom a reactor shutdown within the next 4 hours. GP-006 has been completed through Step 15.

Event Number	Malfunction Number (1)	Event Type*	Event Description
1	NA	BOP(N) SRO(N)	Stop both HDPs per OP-136
2	NA	BOP(N) SRO(N)	Continued plant power reduction
		RO(R) SRO(R)	Reactivity control during power reduction

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Event Number	Malfunction Number (1)	Event Type*	Event Description
3	ICOR LT:486 0 0	BOP(I) SRO(I)	SG B controlling level channel failed low
4	CND04A	BOP(C) SRO(C)	Condenser Vacuum Pump A trip
5	ICOR PT:444 2500 60	RO(I) SRO(I)	Pressurizer Pressure Channel P-444 high failure
6	PRS03F 1 0 10	RO(C) SRO(C)	Pressurizer PORV PCV-444B fails to reseat following high failure of Pressurizer pressure
7	SGN05A 715 720	RO(M) BOP(M) SRO(M)	Steam Generator Tube Rupture on SG A, ramped over 720 secs
8	TUR02	BOP(C) SRO(C)	Main Turbine fails to trip on Reactor Trip
9	SGN04A 50 0	BOP(C) SRO(C)	Steam Generator Safety fails open following isolation of ruptured SG
10	NA	SRO	Classify the Event

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Simulator Setup & Actions Required for Scenario # 1

Event Number	Simulator Operator Actions
INITIAL CONDITIONS	IC-6, 38% power. Set pots BORON 4.04, RMUW 7.5. Press START on scaler timer. Place SG LVL ATWS PANEL BYPASS in BYPASS Equipment OOS is RHR Pump 1B-SB. Rackout breaker and hang tags. • MRF RHR023 RACK_OUT Malfunction for Event 8 ACTIVE AT SETUP • IMF TUR02
1	NONE
2	NONE
3	TRG E3 = ICOR LT:486 0 0
4	TRG E4 = IMF CND04A
5*	TRG E5 = ICOR PT:444 2500 60
6*	TRG E5 = IMF PRS03F 1 0 10
7	TRG E7 = IMF SGN05A 715 720
8	ACTIVE AT SETUP • IMF TUR02
9	TRG E9 = IMF SGN04A 50 0

**** Events #5 and #6 should be activated at same time.***

SHIFT TURNOVER SCENARIO # 1

Power is 38% at BOL. Core burnup is 52 EFPD.

RHR Pump 1B-SB has been out of service for 64 hours and is not expected to be available within the next 8 hours. Technical Specification action 3.5.2.a has been entered and a shutdown at 5 MW/min is being performed to meet Technical Specifications.

Boron concentration is 1230 ppm. Bank D rods are at 152 steps.

Shift orders are to continue the power power reduction and be prepared to perfom a reactor shutdown within the next 4 hours. GP-006 has been completed through Step 15.

Op-Test Number: ______	Scenario Number: 1	Event Number: 1		

Event Description: ***Stop both HDPs per OP-136***

Time	Position	Applicant's Actions or Behaviors
	SRO	Direct the BOP to coordinate removing the HDPs from service per OP-136
	BOP	Create a plot on ERFIS to monitor Heater Drain Pump discharge flow, discharge pressure and heater level. FHD-1255A(B) PHD1255A(B) LHD1250A(B)
	BOP	Establish communications between the Main Control Room and the technician at 4A(B) pneumatic alternate level controller or the operator at the Heater Drain Pump discharge level controller.
	BOP	If desired, direct the AO to place the 4A(B) Feedwater Heater Sight Glass in service by slowly opening the applicable isolation valves listed below: a. 1HD-293-LI1-2 (1HD-299-LI1-2), LG-01HD-1250A (B)Instrument Valve. b. 1HD-293-HI1-2 (1HD-299-HI1-2), LG-01HD-1250A (B) Instrument Valve.
		NOTE: Due to safety concerns with sightglasses failing, this may not be performed. ***CUE: AO reports sight glass isolation valves are open.***

Op-Test Number: ______	Scenario Number: 1	Event Number: 1
Event Description: ***Stop both HDPs per OP-136***		

Time	Position	Applicant's Actions or Behaviors
	BOP	If using Maintenance to control the 4A(4B) pneumatic alternate level controller, perform the following: a. While monitoring Heater Drain Pump discharge flow, direct Maintenance to lower the set point on 4A(B) pneumatic alternate level controller to slowly reduce heater level 1 to 3 inches. b. When Heater Drain Pump discharge flow is less than or equal to 500 kpph, stop Heater Drain Pump A(B). c. Direct Maintenance to slowly adjust 4A(B) Feedwater Heater level to return the controller to the normal set point and stabilize level.
		NOTE: Step 'a' does not have to be completed before performing step 'b' to prevent a Heater Drain Pump from tripping on low flow.
		SIMULATOR OPERATOR INSTRUCTIONS: USE CND053 MAN and CND054 @ 5 (60 sec ramp) AND CND055 MAN and CND056 @ 5 (60 sec ramp).
	BOP	If using an operator to control the Heater Drain Pump discharge level controller, perform the following: a. While monitoring Heater 4A (4B) level and Heater Drain Pump flow, direct the operator to take manual control and slowly shut the Heater Drain Pump discharge level control valve. b. When Heater Drain Pump discharge flow is less than or equal to 500 kpph, stop Heater Drain Pump A(B). c. Direct the operator to place the Heater Drain Pump discharge level controller in Automatic.
		NOTE: Step 'a' does not have to be completed before performing step 'b' to prevent a Heater Drain Pump from tripping on low flow.
		SIMULATOR OPERATOR INSTRUCTIONS: USE CND041 MAN and CND042 @ 10 (60 sec ramp) AND CND043 MAN and CND044 @ 10 (60 sec ramp).

Op-Test Number: ________ Scenario Number: 1 Event Number: 1

Event Description: ***Stop both HDPs per OP-136***

Time	Position	Applicant's Actions or Behaviors
	BOP	Direct the AO to verify the 4A and 4B Feedwater Heater Sight Glasses are isolated by shutting isolation valves listed below: a. 1HD-293-HI1-2, LG-01HD-1250A Instrument Valve. b. 1HD-293-LI1-2, LG-01HD-1250A Instrument Valve. c. 1HD-299-HI1-2, LG-01HD-1250B Instrument Valve. d. 1HD-299-LI1-2, LG-01HD-1250B Instrument Valve.
		NOTE: Due to safety concerns with sightglasses failing, this may not be performed. ***CUE: AO reports isolation valves are closed.***

Op-Test Number: ______	Scenario Number: 1	Event Number: 2
Event Description: ***Continued plant power reduction***		

Time	Position	Applicant's Actions or Behaviors
	SRO	Direct the actions of GP-006
	SRO	Reviews Precautions and Limitations with crew
	BOP	Directs the AO to open the MSR vents to the condenser and 5A/5B heaters
		CUE: AO reports MSR vents are open.
	RO	Controls reactivity during downpower evolution by adjusting rods and/or boron concentration as necessary.

Op-Test Number: ________ Scenario Number: 1 Event Number: 3

Event Description: ***SG B controlling level channel failed low***

Time	Position	Applicant's Actions or Behaviors
		NOTE TO SIMULATOR OPERATOR: EVENT 3 SHOULD BE ACTIVATED AFTER POWER IS REDUCED APPROXIMATELY 5%.
	BOP	Diagnose low failure of controlling SG 'B' level channel - SG B NR LVL/SP HI/LO DEV (ALB-14-2-1B) alarming - STEAM GEN B LOW LVL (ALB-14-5-4A) alarming - STEAM GEN B LOW-LOW LEVEL (ALB-14-5-4B) alarming - SG 'B' level, LI-486 SB, indicating 0% - SG B FW > STM FLOW MISMATCH (ALB-14-5-1A) alarming - SG 'B' feed flow > steam flow - SG 'B' feed reg valve opening - SG 'B' level rising on operable SG level channels
	SRO	Directs the BOP to take manual control of FCV-488 and reduce feed flow
	BOP	Take manual control of FCV-488 and reduce feed flow
		CRITICAL STEP TO TAKE MANUAL CONTROL OF FCV-488 AND CONTROL FEED FLOW TO PREVENT HIGH-HIGH LEVEL TRIP.
	BOP	Restore SG 'B' level with feed flow and steam flow matched

Op-Test Number: ________	Scenario Number: 1 Event Number: 3
Event Description: ***SG B controlling level channel failed low***	

Time	Position	Applicant's Actions or Behaviors
	SRO	Refer to OWP-RP for SG 'B' level failure
	SRO	Refers to TS 3.3.1, 3.3.2, 3.3.3.6 (most limiting is 6 hour requirement to trip bistables)
	SRO	Initiate a WR/JO

Op-Test Number: ________ Scenario Number: 1 Event Number: 4

Event Description: ***Condenser Vacuum Pump A trip***

Time	Position	Applicant's Actions or Behaviors
	BOP	Diagnose trip of Condenser Vacuum Pump 'A' - CONDENSER VACUUM PUMP A TRIP (ALB-021-4-1) alarming - Condenser Vacuum Pump 'A' light indication - Slowly lowering condenser vacuum
	SRO	If condenser vacuum lowers, refers to and directs the actions of AOP-012
	SRO	Directs BOP to start standby Vacuum Pump
	BOP	Starts Condenser Vacuum Pump 'B'
	SRO	Initiates WR/JO

Op-Test Number: ________ Scenario Number: 1 Event Number: 5

Event Description: ***Pressurizer Pressure Channel P-444 high failure***

Time	Position	Applicant's Actions or Behaviors
	RO	Diagnoses high failure of Pressurizer Pressure channel P-444 - PRESSURIZER HIGH PRESS DEVIATION CONTROL (ALB-009-3-1), alarming - PRESSURIZER RELIEF DISCHARGE HIGH TEMP (ALB-009-8-2), alarming - PRESSURIZER HIGH-LOW PRESS (ALB-009-5-1), alarming - PRESSURIZER RELIEF TANK HIGH-LOW LEVEL PRESS OR TEMP (ALB-009-8-1), alarming - PRZ heaters off - PRZ sprays open - PRZ PORV 444B open - PRZ pressure lowering on other channels
	SRO	Enters and directs the actions of AOP-019
	RO	Verifies proper operation of PRZ PORVs and determines PORV 444B failed to fully close as pressure lowers **(Part of Event 6)**

Op-Test Number: ________ Scenario Number: 1 Event Number: 5

Event Description: ***Pressurizer Pressure Channel P-444 high failure***

Time	Position	Applicant's Actions or Behaviors
	RO	Takes manual control of pressurizer pressure by either: a. Placing master controller PK-444A in manual, or b. Placing heaters and spray valves in manual
	RO	Attempts to close PRZ PORV 444B by placing control switch in CLOSE **(Part of Event 6)**
	RO	Closes PRZ PORV 444B isolation valve, RC-113 **(Part of Event 6)**
	RO	Restore pressurizer pressure to normal using manual control

Op-Test Number:		Scenario Number: 1	Event Number: 6	

Event Description: ***Pressurizer PORV PCV-444B fails to reseat following high failure of Pressurizer pressure***

Time	Position	Applicant's Actions or Behaviors
	SRO	Diagnoses failure of PORV 444B to reseat - Valve position indication - Pressurizer pressure below 2335 psig - PRESSURIZER RELIEF DISCHARGE HIGH TEMP (ALB-009-8-2) alarming
	SRO	Directs RO to close PORV 444B
	RO	Attempts to close PORV 444B, but determines valve will not fully close
	SRO	Directs RO to isolate PORV 444B
	RO	Closes PRZ PORV 444B isolation valve, RC-113
		CRITICAL STEP TO CLOSE RC-113 TO PREVENT LOW PRESSURE REACTOR TRIP AND SAFETY INJECTION.

Op-Test Number: ________ Scenario Number: 1 Event Number: 6

Event Description: ***Pressurizer PORV PCV-444B fails to reseat following high failure of Pressurizer pressure***

Time	Position	Applicant's Actions or Behaviors
	SRO	Refers to TS 3.4.4 (1 hour requirement)
	SRO	Initiate a WR/JO

Op-Test Number:	______	Scenario Number:	1	Event Number:	7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnoses Steam Generator Tube Rupture on SG A - Charging flow greater than letdown flow with constant Tavg and PRZ level - Increased VCT makeup system operation - Turbine building vent stack or condenser vacuum pumps effluent radiation monitor(s) increasing or alarming - SG blowdown radiation monitor increasing or alarming - Main steam line radiation monitor increasing or alarming
	SRO	Enters and directs the actions of AOP-016
	CREW	If RCS leakage is determined to be greater than automatic OR manual VCT makeup capability, THEN: a. Trips the reactor. b. Manually initiates safety injection c. Go To EOP Path-1.
	RO	Verify Reactor Makeup Control System operates to maintain VCT level

Op-Test Number: ________ Scenario Number: 1 Event Number: 7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	RO	Maintain pressurizer level by increasing charging and, if necessary, isolating letdown
	RO	Attempt to determine RCS leak rate
		NOTE: May be difficult to estimate leak rate due to increasing size of SGTR causing change in charging flow and pressurizer level.
	SRO	If time permits, refer to TS 3.4.6.2 for leakage limitations
	SRO	Notify radiological personnel of tube rupture

Op-Test Number: ________ Scenario Number: 1 Event Number: 7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	SRO	Attempt to quantify leakage to SG from RCS
	SRO	Determine leaking SG(s) by: - Individual SGBD samples - Main steam line radiation monitor levels - Local surveys of SGBD lines
	SRO	If turbine building vent stack radiation monitor reaches the alert alarm, notify Chemistry to sample the stack for assessment of offsite dose impact
	SRO	Orders manual reactor trip and safety injection when leak exceeds makeup capabilities
	SRO	Enters and directs the actions of EOP PATH-1

Op-Test Number: ______ Scenario Number: 1 Event Number: 7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	SRO	Initiates monitoring of CSFSTs
	RO	Manually trips the reactor and manually initiates safety injection
	BOP	Determines turbine failed to automatically trip and manually trips the turbine **(Event 8)**
		CRITICAL TO TRIP TURBINE TO PREVENT EXCESSIVE COOLDOWN AND DEPRESSURIZATION OF RCS THAT RESULTS IN LOSS OF SUBCOOLING.
	BOP	Determines 1A-SA and 1B-SB powered from offsite source
	RO	Determines SI manually actuated
	CREW	Begin monitoring of Foldout A

Op-Test Number: ______ Scenario Number: 1 Event Number: 7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	CREW	Verifies the following: - All CSIPs and 1A-SA RHR pump running - 2 CCW pumps running - All ESW and ESW booster pumps running - Containment pressure below 10 psig - Phase A isolation valves shut - SGBD and sample isolation valves shut - FW isolation has occurred and MFW pumps tripped
	BOP	Verifies both MDAFW pumps running
		NOTE: SRO may direct at this time that AFW flow be isolated to SG 'A' once level is above 10%.
	BOP	Verifies MSL isolation NOT required and MSL isolation valves open
	BOP	Verifies the following: - Both EDGs running - Containment Fan Coolers running in slow speed - CV isolation has occurred - CR ventilation aligned for emergency recirc
	RO	Verify proper SI alignment - SI flow > 200 gpm - RCS pressure > 190 psig

Op-Test Number: ______	Scenario Number: 1	Event Number: 7
Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***		

Time	Position	Applicant's Actions or Behaviors
	BOP	Verifies adequate AFW flow and/or adequate SG level, determines AFW valves properly aligned, and controls AFW flow to maintain proper SG level
	RO	Verifies proper SI alignment
	RO	Resets SI, Phase A, Phase B, and FW isolation
	BOP	Energize AC buses 1A1 and 1B1
	RO	Establish instrument air and nitrogen to containment
	SRO	Directs AO to place IA compressors in LOCAL

Op-Test Number: ________ Scenario Number: 1 Event Number: 7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	BOP	Align Containment Hydrogen Monitoring and Control Room Ventilation
	BOP	Reset MSRs
	RO	Ensure all unisolated PRZ PORVs shut
		NOTE: Unisolating the failed PORV could result in an uncontrolled depressurization.
	RO	Control RCS pressure and maintain normal seal injection
	CREW	Determine NO SG depressurizing in an uncontrolled manner or completely depressurized

Op-Test Number: ______ Scenario Number: 1 Event Number: 7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	CREW	Determine secondary radiation levels NOT normal
		NOTE: Previously alarming and/or high secondary radiation monitors may be lowering and/or no longer alarming due to monitors being isolated. This should NOT preclude making the determination that secondary radiation levels are abnormal.
	SRO	Transition to and direct the actions of EOP PATH-2, Entry Point J
	CREW	Begin monitoring Foldouts C and D
	SRO	Implement FRPs as required
		NOTE: No FRPs are anticipated to be required at this time.
	RO	Verify SR energizes

Op-Test Number: ______ Scenario Number: 1 Event Number: 7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	RO	Align CCW to sample system
	SRO	Direct chemistry to obtain boron and activity samples of all SGs and RCS
	CREW	Identify ruptured SG - Rising level with AFW isolated - Boron and activity samples, when available
	BOP	Isolates ruptured SG - Adjusts PORV controller and verifies proper operation - Shut steam supply to TDAFW pump - Shut blowdown isolation valves on 'A' SG - Shut 'A' MSIV and bypass - Shut 'A' SG main steam drain isolation before MSIV - Control feed flow to 'A' SG to maintain level 10% to 15%
		NOTE: Level is likely to be well above 15% due to the large size of the SGTR.
		NOTE TO SIMULATOR OPERATOR: INSERT EVENT 9 (SG SAFETY FAILS OPEN) AFTER SG ISOLATED PER PATH-2.

Op-Test Number: ______ Scenario Number: 1 Event Number: 7

Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnoses failed open SG safety valve **(Event 9)** - Lowering SG pressure - Lowering RCS temperature - Steam flow indicated
	SRO	Transitions to and directs the actions of EPP-014 - Based on foldout item for faulted SG
	BOP	Shuts MSIVs 'B' and 'C'
	BOP	Shuts AFW isolations to SG 'A' - 1AF-55 - 1AF-137
	BOP	Shuts MSIV Before Seat Drains on 'B' and 'C' - 1MS-266 - 1MS-201
	SRO	Transitions to PATH-2, Entry Point J, and directs the actions
		NOTE: Actions already taken in PATH-2 must be verified, but are NOT included in scenario actions.

Op-Test Number:	______	Scenario Number:	1	Event Number:	7
Event Description:	***Steam Generator Tube Rupture on SG A, ramped over 720 secs***				

Time	Position	Applicant's Actions or Behaviors
	SRO	Determines SG pressure > 300 psig
		NOTE: If pressure determined to be < 300 psig at this time, a transition to EPP-020 would be required. ***IF TRANSITION MADE TO EPP-020 AT THIS TIME, TERMINATE SCENARIO.***
	RO	Trips RCPs based on Foldout Page Criteria
		CRITICAL TO TRIP RCPs PRIOR TO COMMENCING RCS COOLDOWN.
	RO	Block low steamline pressure SI
	SRO	Determines target cooldown temperature based on ruptured SG pressure

Op-Test Number: ______	Scenario Number: 1	Event Number: 7
Event Description: ***Steam Generator Tube Rupture on SG A, ramped over 720 secs***		

Time	Position	Applicant's Actions or Behaviors
	BOP	Dumps steam from intact SGs to cooldown to target temperature
	SRO	Determines target cooldown temperature based on ruptured SG pressure
	BOP	Dumps steam from intact SGs to cooldown to target temperature
		NOTE: RCS temperature may already be at or below target temperature due to faulted SG.
		TERMINATE SCENARIO WHEN TARGET TEMPERATURE IS DETERMINED AND COOLDOWN IS COMMENCED.

Op-Test Number: ________ Scenario Number: 1 Event Number: 8

Event Description: ***Main Turbine fails to trip on Reactor Trip***

Time	Position	Applicant's Actions or Behaviors
		NOTE: Actions for Event 8 are performed during Event 7.

Op-Test Number: ______ Scenario Number: 1 Event Number: 9

Event Description: ***Steam Generator Safety fails open following isolation of ruptured SG***

Time	Position	Applicant's Actions or Behaviors
		NOTE: Actions for Event 9 are performed during Event 7.

Op-Test Number: ________ Scenario Number: 1 Event Number: 10

Event Description: ***Classify the Event***

Time	Position	Applicant's Actions or Behaviors
	SRO	Classifies the event as a Site Area Emergency (EAL 2-1-3)
		NOTES: ***1) Based on SGTR with failed open safety valve with fuel intact. (2 FPBs Breached)*** ***2) Classification of the event following the scenario is considered 20% of the Performance Rating for JPM SRO-A.4.***

Facility: **SHNPP** Scenario Number: **2** Op-Test Number: 2000-301

Examiners

Operators
(S3)
(R3)
(R1)

Objectives: To evaluate the candidates' ability to perform a power reduction at EOL. To evaluate the candidates' ability to respond to a trip of a Main Feedwater Pump, resulting in a turbine runback, a controlling channel of SG pressure failure, a trip of the running CCW Pump with a failure of the standby pump to automatically start, and a Tavg Median failure. To evaluate the response to a spurious safety injection on a single train with a subsequent failure of the reactor to trip automatically. Post-trip response will be evaluated based on a trip of a motor-driven AFW pump and an overspeed trip of the turbine-driven AFW pump, followed by a loss of Bus 1A-SA, resulting in a loss of heat sink event. The candidates will be required to depressurize to allow feeding the SGs with a condensate pump.

Initial Conditions: IC-15. 80% power EOL; Equipment out of service is EDG 1A-SA.

Turnover: 80% power, EOL. Core burnup is 439 EFPD.

Equipment out-of-service is EDG 1A-SA. Technical Specification 3.8.1.1.b was entered 14 hours ago.

Boron concentration is 271 ppm. Bank D rods are at 199 steps. 'A' BTRS demineralizer is aligned for service.

Shift orders are to continue the plant shutdown at a rate not to exceed 5 MW/min, but to be in Hot Standby within the next 6 hours as directed by plant management. GP-006 has been completed through Step 7.

Event Number	Malfunction Number (1)	Event Type*	Event Description
1	NA	BOP(N) SRO(N)	Down Power Ramp
		RO(R) SRO(R)	Control of reactivity during down power ramp

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Event Number	Malfunction Number (1)	Event Type*	Event Description
2	CFW16B	BOP(C) SRO(C)	Main Feedwater Pump 'B' trip
	NA	RO(R) SRO(R)	Control of reactivity during turbine runback
3	PT:495 1300 0	BOP(I) SRO(I)	Controlling Channel of SG C pressure high failure
4	CCW01A	RO(C) SRO(C)	Operating CCW Pump Trip with failure of standby pump to automatically start
	CCW047 0 0	RO(C) SRO(C)	(Failure of standby pump to automatically start)
5	RCS06A 650	RO(I) SRO(I)	High failure of RCS Median Select T-avg circuit
6	SIS01A 1	RO(C) SRO(C)	Inadvertant Train 'A' Safety Injection with Failure of Reactor to Automatically Trip
	RPS01B 3 1	RO(C) SRO(C)	(Failure of reactor to automatically trip)
7	CFW01B	BOP(C) SRO(C)	Trip of AFW Pump 1B-SB breaker (Results in loss of heat sink with Events 8 and 9)
8	CFW01C	RO(M) BOP(M) SRO(M)	Overspeed trip of Turbine Driven AFW Pump
9	EPS05A	RO(M) BOP(M) SRO(M)	Loss of Emergency Bus 1A-SA resulting in loss of heat sink
10	CFW16A	RO(M) BOP(M) SRO(M)	Loss of Main Feed Pump A
11	NA	SRO	Classify the Event

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Simulator Setup & Actions Required for Scenario # 2

Event Number	Simulator Operator Actions
INITIAL CONDITIONS	IC-15, 80% power. Set pots BORON 0.89, RMUW 7.5. Press START on scaler timer. Equipment OOS is EDG 1A-SA. Rackout breaker and hang tags. • MRF DSG021 LOCAL • MRF DSG022 MAINTAIN Part of Malfunction for Event 4 ACTIVE AT SETUP • MRF CCW047 0 0 Part of Malfunction for Event 6 ACTIVE AT SETUP • IMF RPS01B 3 1
1	NONE
2	TRG E2 = IMF CFW16B
3	TRG E3 = ICOR PT:495 1300 0
4	TRG E4 = IMF CCW01A ACTIVE AT SETUP • MRF CCW047 0 0
5	TRG E5 = IMF RCS06A 650
6*	TRG E6 = IMF SIS01A 1 ACTIVE AT SETUP • IMF RPS01B 3 1
7*	TRG E6 = IMF CFW01B
8*	TRG E6 = IMF CFW01C
9*	TRG E6 = IMF EPS05A
10*	TRG E6 = IMF CFW16A

**** Events 6, 7, 8, 9 and 10 should be activated at the same time.***

SHIFT TURNOVER SCENARIO # 2

80% power, EOL. Core burnup is 439 EFPD.

Equipment out-of-service is EDG 1A-SA. Technical Specification 3.8.1.1.b was entered 14 hours ago.

Boron concentration is 271 ppm. Bank D rods are at 199 steps. 'A' BTRS demineralizer is aligned for service.

Shift orders are to continue the plant shutdown at a rate not to exceed 5 MW/min, but to be in Hot Standby within the next 6 hours as directed by plant management. GP-006 has been completed through Step 7.

Op-Test Number: ________ Scenario Number: 2 Event Number: 1

Event Description: ***Down Power Ramp***

Time	Position	Applicant's Actions or Behaviors
	SRO	Direct the actions of GP-006
	SRO	Reviews Precautions and Limitations with crew
	SRO	When less than 90% (~505 psig) first stage Turbine pressure, have Maintenance verify that PS-01MS-1006 is reset.
		CUE: Maintenance reports pressure switch is reset.
	BOP	When less than 75% Turbine load, verify the SGBD Regenerative Heat Exchanger Condensate Outlet is aligned to the CPD effluent per OP-127
	RO	Controls reactivity during downpower evolution by adjusting rods and/or boron concentration as necessary.
	BOP	Controls turbine load during power reduction

Op-Test Number: ________ Scenario Number: 2 Event Number: 2

Event Description: ***Main Feedwater Pump 'B' trip***

Time	Position	Applicant's Actions or Behaviors
		NOTE TO SIMULATOR OPERATOR: EVENT 2 (FWP TRIP) SHOULD BE ACTIVATED AFTER POWER IS REDUCED APPROXIMATELY 3%.
	CREW	Diagnoses trip of Main Feed Water Pump 'B' - Breaker position indicates pump trip - FW PUMP A/B O/C TRIP - GND OR BKR FAIL TO CLOSE (ALB-016-1-4) alarming - FW PUMP A/B AUTO START OR DISCHARGE HI-HI PRESS (ALB-016-1-5) alarming - SG A STM > FW FLOW MISMATCH (ALB-014-4-1B) alarming - SG B STM > FW FLOW MISMATCH (ALB-014-5-1B) alarming - SG C STM > FW FLOW MISMATCH (ALB-014-6-1B) alarming - TURBINE RUNBACK OPERATIVE (ALB-020-2-2) alarming - Feedwater flow lowering - SG level lowering
	SRO	Enters and directs the actions of AOP-010
	BOP	Verify turbine runback to less than 60% load in progress

Op-Test Number: ________ Scenario Number: 2 Event Number: 2

Event Description: ***Main Feedwater Pump 'B' trip***

Time	Position	Applicant's Actions or Behaviors
	BOP	Isolate SG Blowdown. ***NOTE: This action may not be performed since power was below 80%.***
	BOP	Reduce turbine load until total feedwater flow less than or equal to 6.7 mpph
	RO	Control reactivity during turbine runback by adjusting rods and/or boron concentration as necessary
	BOP	Verify hotwell level being maintained between 71% and 76%
	BOP	When target load is reached and plant is stable, place SG Blowdown in service per OP-127, Steam Generator Blowdown, if previously removed from service

Op-Test Number: ________	Scenario Number: 2	Event Number: 2		

Event Description: ***Main Feedwater Pump 'B' trip***

Time	Position	Applicant's Actions or Behaviors
	BOP	Momentarily place the tripped MFW Pump control switch in STOP
	SRO	If load was changed by greater than 15% rated thermal power in any one hour, then notify Chemistry to initiate surveillances per TS 3.4.8
	SRO	Initiate WR/JO
	SRO	Enters and directs the actions of AOP-015
	BOP	Resets C7A and C7B, as required

Op-Test Number: ________ Scenario Number: 2 Event Number: 3

Event Description: ***Controlling Channel of SG C pressure high failure***

Time	Position	Applicant's Actions or Behaviors
		NOTE TO SIMULATOR OPERATOR: ENSURE ALL FEED REG VALVES HAVE BEEN RETURNED TO AUTOMATIC CONTROL PRIOR TO INSERTING THIS EVENT.
	BOP	Diagnose high failure of controlling SG 'C' pressure channel - LOOP A HI STEAM LINE DP LOW-P1 (ALB-014-1-2) alarming - LOOP B HI STEAM LINE DP LOW-P3 (ALB-014-2-2) alarming - SG C STM > FW FLOW MISMATCH (ALB-014-6-1B) alarming - SG 'C' actual feed flow > steam flow - SG 'C' feed reg valve opening - SG 'C level rising
	SRO	Directs the BOP to take manual control of FCV-498 and reduce feed flow
	BOP	Take manual control of FCV-498 and reduce feed flow
		CRITICAL STEP TO TAKE MANUAL CONTROL OF FCV-498 AND CONTROL FEED FLOW TO PREVENT HIGH-HIGH LEVEL TRIP.
	BOP	Restore SG 'B' level with feed flow and steam flow matched

Op-Test Number: ________ Scenario Number: 2 Event Number: 3

Event Description: ***Controlling Channel of SG C pressure high failure***

Time	Position	Applicant's Actions or Behaviors
	SRO	Refer to OWP-RP for SG 'C' pressure failure (SF/FF Loop 3)
	BOP	Selects Channel 495 for control in accordance with OWP-RP
	SRO	Refers to TS 3.3.1 (6 hour requirement to trip bistables)
	SRO	Initiate a WR/JO

Op-Test Number: ________ Scenario Number: 2 Event Number: 4

Event Description: ***Operating CCW Pump Trip with failure of standby pump to automatically start***

Time	Position	Applicant's Actions or Behaviors
	RO	Diagnose trip of CCW Pump 1A-SA and failure of CCW Pump 1B-SB to automatic start - Numerous alarms on ALB-005 due to no CCW flow - Breaker indication on CCW Pump 1A-SA - Failure of CCW Pump 1B-SB to start
	SRO	Enters and directs the actions of AOP-014
	RO	Start CCW Pump 1B-2B
	RO	Reopen 1CC-252, if closed, to restore CCW to RCP Thermal Barrier HX per AOP-018
	SRO	Refers to TS 3.7.3 (72 hour action)

Op-Test Number: ______ Scenario Number: 2 Event Number: 4

Event Description: ***Operating CCW Pump Trip with failure of standby pump to automatically start***

Time	Position	Applicant's Actions or Behaviors
	SRO	Initiate WR/JO
		NOTE: If AO is dispatched to investigate auto start failure, report that the discharge PT isolation (1CC-112) was found shut.

Op-Test Number: ______	Scenario Number:	2	Event Number:	5

Event Description: ***High failure of RCS Median Select T-avg circuit***

Time	Position	Applicant's Actions or Behaviors
	RO	Diagnose high failure of RCS Median Select Tavg circuit - Rods inserting - TR-408 Red Pen at max output - RCS LOOPA/B/C TAVG HI/LO DEV (ALB-010-6-3A/7-3A/8-3A) all alarming - RCS TREF/TAVG HIGH-LOW (ALB-010-6-4B) alarming - PRESSURIZER CONTROL LOW LEVEL DEVIATION (ALB-009-2-2) alarming - Charging flow FI-122A.1 increasing - FK-122 output increasing
	SRO	Enter and direct the actions of AOP-001
	RO	Place Rod Control Selector Switch in Manual and verify rod motion stops ***NOTE: This is an IMMEDIATE ACTION of AOP-001.***
	RO	Verify PRZ pressure control system responding properly
	RO	Manually withdraw control rods to restore RCS temperature

Op-Test Number: ________ Scenario Number: 2 Event Number: 5

Event Description: ***High failure of RCS Median Select T-avg circuit***

Time	Position	Applicant's Actions or Behaviors
	RO	Manually control PZR level and restore to program
	SRO	Initiate a WR/JO

Op-Test Number: ________ Scenario Number: 2 Event Number: 6

Event Description: ***Inadvertant Train 'A' Safety Injection with Failure of Reactor to Automatically Trip***

Time	Position	Applicant's Actions or Behaviors
		NOTE TO SIMULATOR OPERATOR: ENSURE ALL SG LEVELS HAVE BEEN RETURNED TO APPROXIMATELY 66% PRIOR TO INSERTING THIS EVENT. IT IS ALSO PREFERABLE TO ENSURE THAT ALL FEED REG VALVES ARE IN AUTOMATIC CONTROL.
	CREW	Diagnoses Reactor Trip signal - Reactor Trip annunciator - Safety Injection annunciator
	SRO	Enters and directs the actions of EOP PATH-1
	RO	Determines reactor failed to automatically trip - Reactor trip breakers closed - Rod bottom lights off - Neutron flux NOT decreasing
	RO	Manually trips the reactor and verifies trip - Reactor trip breakers open - Rod bottom lights on - Neutron flux decreasing
		CRITICAL STEP TO MANUALLY TRIP THE REACTOR FROM THE CONTROL ROOM AND NOT RELY ON LOCAL TRIP.

Op-Test Number: ________ Scenario Number: 2 Event Number: 6

Event Description: ***Inadvertant Train 'A' Safety Injection with Failure of Reactor to Automatically Trip***

Time	Position	Applicant's Actions or Behaviors
	BOP	Verifies turbine tripped - All turbine throttle valves shut - All turbine governor valves shut
	BOP	Verifies only emergency safeguards bus 1B-SB powered from offsite
	RO	Determines single train of SI actuated and manually actuates of Safety Injection OR aligns ALL individual components during the performance of EOP PATH-1 (No power available to Train 'A' equipment)
		CRITICAL STEP TO ACTUATE OR ALIGN BOTH TRAINS OF SAFEGUARDS EQUIPMENT PRIOR TO COMPLETION OR TRANSITION OUT OF EOP PATH-1.
	CREW	Verifies Train 'B' equipment aligned for ECCS mode
	CREW	Diagnoses loss of Bus 1A-SA AND loss of all feedwater flow to SGs - SI causes FW Isolation - AFW Pump 1B-SB tripped - TDAFW Pump tripped - AFW Pump 1A-SA loss of power
		NOTE: A transition to FRP-H.1 should only be made when directed by PATH-1 or upon exiting PATH-1.

Op-Test Number: ______	Scenario Number: 2	Event Number: 7
Event Description: ***Loss of Heat Sink***		

Time	Position	Applicant's Actions or Behaviors
	SRO	Transitions to and directs the actions of FRP-H.1 ***NOTE: During the implementation of FRP-H.1 the SRO may be required to direct resetting SI and Phase A to allow establishing instrument air and nitrogen to containment to allow for pressure control of the RCS.***
	CREW	Begins monitoring of foldout for FRP-H.1
	SRO	Verifies heat sink required - RCS pressure > SG pressure - RCS temperature > 350 °F
	SRO	If any of the following occurs. immediately perform Steps 12 through 21 for RCS bleed and feed: - SG wide range level any two less than 10% - PRZ pressure ≥ 2335 psig due to loss of secondary heat sink - RCS temperature AND pressure increasing due to loss of secondary heat sink
	RO	Stop running RHR pump

Op-Test Number: ________ Scenario Number: 2 Event Number: 7

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

Time	Position	Applicant's Actions or Behaviors
	SRO	Contact personnel to assist in troubleshooting / repair of AFW pump(s) and / or restoration of Bus 1A-SA
	RO	Stop all RCPs
		CRITICAL STEP TO STOP ALL RCPs TO MINIMIZE HEAT INPUT TO THE RCS.
		NOTE: The following series of steps are performed to attempt feeding the SGs with Main Feed.
	BOP	Verifes Condensate system in operation
	RO	Reset SI
	RO	Reset FW Isolation

Op-Test Number: ________ Scenario Number: 2 Event Number: 7

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

Time	Position	Applicant's Actions or Behaviors
	BOP	Place feed bypass valve controllers in manual with zero output
	BOP	Reset and open preheater bypass valves
	BOP	Open FW Pump recirc valve for MFW pump to be started
	BOP	Attempts to start the MFW Pump
	BOP	Determines MFW Pump fails to start

Op-Test Number: ________ Scenario Number: 2 Event Number: 7

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

Time	Position	Applicant's Actions or Behaviors
		NOTE: The following series of steps are performed to feed the SGs with Condensate Booster Pumps.
	RO	Depressurize the RCS to 1950 psig using one PRZ PORV.
	RO	Blocks low PRZ pressure SI and low steamline pressure SI
	BOP	Depressurize at least 1 SG to < 500 psig using SG PORV ***NOTE: Preferable to use only 1 SG, but acceptable to use more than 1. Must use either SG 'B' or SG 'C' due to SG 'A' not being available due to loss of power to PORV.***
		CRITICAL TO ALLOW FEEDING WITH A CONDENSATE BOOSTER PUMP.
	BOP	Verify at least one condensate and condensate booster pump running

Op-Test Number: ________ Scenario Number: 2 Event Number: 7

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

Time	Position	Applicant's Actions or Behaviors
	BOP	Open the LP heater bypass valves - 1CE-330 - 1CE-359
	BOP	Open the HP heater bypass valve - 1FW-110
	BOP	Open Main FW Pump discharge valves - 1FW-29 - 1FW-60
	RO	Reset SI ***NOTE: May have previously performed to allow depressurizing RCS.***
	BOP	Reset FWI

Op-Test Number: ________ Scenario Number: 2 Event Number: 7

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

Time	Position	Applicant's Actions or Behaviors
	BOP	Place FRV Bypass Valve controllers in MAN and zero output
	BOP	Control Condensate Booster Pump in MAN at 600 psig
	BOP	Shut MFW Pump recirc valves
	SRO BOP	Establish condensate flow to the SGs per the guidance of Attachment 1 (feed limits based on level)
	SRO	If SG level > 5% NR, establish FW flow using the feed reg bypass valves, OR, if SG level < 5% NR, direct an AO to locally establish FW flow using the feed reg bypass valves
		NOTE: Expected that local action will be required based on SG levels.
		TERMINATE THE SCENARIO WHEN FLOW HAS BEEN ESTABLISHED TO THE SGs.

Op-Test Number: ______ Scenario Number: 2 Event Number: 8

Event Description: ***Overspeed trip of Turbine Driven AFW Pump***

Time	Position	Applicant's Actions or Behaviors
		NOTE: ACTIONS FOR EVENT 8 ARE INCLUDED AS PART OF RESPONSE DURING EVENT 7.

Op-Test Number: ________ Scenario Number: 2 Event Number: 9

Event Description: ***Loss of Emergency Bus 1A-SA resulting in loss of heat sink***

Time	Position	Applicant's Actions or Behaviors
		NOTE: ACTIONS FOR EVENT 9 ARE INCLUDED AS PART OF RESPONSE DURING EVENT 7.

Op-Test Number: ________ Scenario Number: 2 Event Number: 10

Event Description: ***Loss of Main Feed Pump A***

Time	Position	Applicant's Actions or Behaviors
		NOTE: ACTIONS FOR EVENT 10 ARE INCLUDED AS PART OF RESPONSE DURING EVENT 7.

Op-Test Number: ________ Scenario Number: 2 Event Number: 11

Event Description: ***Classify the Event***

Time	Position	Applicant's Actions or Behaviors
	SRO	Classifies the event as a Site Area Emergency (EAL 8-2-3)
		NOTES: ***1) Based on Loss of Secondary Heat Sink Capability required for Mode 3 (EAL Table 3).*** ***2) Classification of the event following the scenario is considered 20% of the Performance Rating for JPM SRO-A.4.***

Facility: **SHNPP** Scenario Number: 3 Op-Test Number: 2000-301

Examiners

Operators
(S2) ______
(R2) ______
(R3) ______

Objectives: To evaluate the candidates' ability to raise power and control reactivity. To evaluate the candidates' ability to respond to a failed feed flow channel, a trip of the running CSIP, a failed VCT level channel, and a partial loss of condenser vacuum. To evaluate the candidates' response to a steamline break inside containment which will require a plant trip with the failure of the reactor to trip from the Control Room. Post-trip complications will include a failure of both trains of Containment Spray to actuate, requiring manual operation and alignment.

Initial Conditions: IC-5; 49% power BOL; Equipment OOS is HDP A.

Turnover: Power is 49% at BOL, 6 hours following a startup with a power ramp of 3 MW/min.

Train 'A' of condensate and condensate booster pumps is in service. HDPs are not operating.

HDP A is out of service for oil replacement due to contaminants and is expected to be returned to service within the next hour.

Boron concentration is 1510 ppm. Bank D rods are at 149 steps.

Shift orders are to continue raising power at the current rate and restore HDP A to service when it becomes available. GP-005, Step 140, has been completed.

Event Number	Malfunction Number (1)	Event Type*	Event Description
1	NA	BOP(N) SRO(N)	Up Power Ramp
		RO(R) SRO(R)	Control of reactivity during up power ramp
2	FT:477 0 0	BOP(I) SRO(I)	Controlling channel of SG A feed flow fails low

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Event Number	Malfunction Number (1)	Event Type*	Event Description
3	CVC05A	RO(C) SRO(C)	Trip of CSIP A
4	LT:112 100 5	RO(I) SRO(I)	VCT level channel LT-112 failed high
5	CND03 18	BOP(C) SRO(C)	Partial loss of condenser vacuum
6	MSS01C 8E6 1200	RO(M) BOP(M) SRO(M)	Main steamline break inside of Containment with failure of Reactor to Trip from Control Room
	RPS01B 3 3	RO(M) BOP(M) SRO(M)	(ATWS)
7	ZRPK505A FAIL_ASIS ZRPK505B FAIL_ASIS ZRPK519A FAIL_ASIS ZRPK519B FAIL_ASIS	RO(C) SRO(C)	Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment
8	NA	SRO	Classify the Event

* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor
(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Simulator Setup & Actions Required for Scenario # 3

Event Number	Simulator Operator Actions
INITIAL CONDITIONS	IC-5, 49% power. Set pots BORON 5.04, RMUW 7.5. Press START on scaler timer. Equipment OOS is HDP 'A'. Rackout breaker and hang tags. • MRF CND065 RACK_OUT Part of Malfunction for Event 6 ACTIVE AT SETUP • IMF RPS01B 3 3 Malfunction for Event 7 ACTIVE AT SETUP • ICOR ZRPK505A FAIL_ASIS • ICOR ZRPK505B FAIL_ASIS • ICOR ZRPK519A FAIL_ASIS • ICOR ZRPK519B FAIL_ASIS
1	NONE
2	TRG E2 = ICOR FT:477 0 0
3	TRG E3 = IMF CVC05A
4	TRG E4 = ICOR LT:112 100 5
5	TRG E5 = IMF CND03 18
6	TRG E6 = IMF MSS01C 8E6 1200 ACTIVE AT SETUP • IMF RPS01B 3 3
7	ACTIVE AT SETUP • ICOR ZRPK505A FAIL_ASIS • ICOR ZRPK505B FAIL_ASIS • ICOR ZRPK519A FAIL_ASIS • ICOR ZRPK519B FAIL_ASIS

SHIFT TURNOVER SCENARIO # 3

Power is 49% at BOL, 6 hours following a startup with a power ramp of 3 MW/min.

Train 'A' of condensate and condensate booster pumps is in service. HDPs are not operating.

HDP A is out of service for oil replacement due to contaminants and is expected to be returned to service within the next hour.

Boron concentration is 1510 ppm. Bank D rods are at 149 steps.

Shift orders are to continue raising power at the current rate and restore HDP A to service when it becomes available. GP-005, Step 140, has been completed.

Op-Test Number: ______ Scenario Number: 3 Event Number: 1

Event Description: ***Up Power Ramp***

Time	Position	Applicant's Actions or Behaviors
	SRO	Direct the actions of GP-005
	SRO	Reviews Precautions and Limitations with crew
	SRO	Notifies the CPD operator that a second Condensate and Feedwater train is being placed in service
		CUE: CPD operator reports that adequate CPDs are in service.
	BOP	Coordinate with the RO to continue raising power
	RO	Controls reactivity during up power evolution by adjusting rods and/or boron concentration as necessary.

Op-Test Number: ________ Scenario Number: 3 Event Number: 1

Event Description: ***Up Power Ramp***

Time	Position	Applicant's Actions or Behaviors
	BOP	Places second Condensate Pump in service - Directs AO to open Condensate Pump seal water supply and perform pre-start checks of pump - Verifies discharge valve open - Starts pump

Op-Test Number: ________ Scenario Number: 3 Event Number: 2

Event Description: ***Controlling channel of SG A feed flow fails low***

Time	Position	Applicant's Actions or Behaviors
		NOTE TO SIMULATOR OPERATOR: EVENT 2 (FEED FLOW FAILURE) SHOULD BE ACTIVATED AFTER POWER IS RAISED APPROXIMATELY 3%.
	CREW	Diagnose low failure of controlling SG 'A' feed flow channel - SG A STM > FW FLOW MISMATCH (ALB-014-4-1B) alarming - FI-477 indicating 0 - SG 'A' feed reg valve opening - SG 'A' level increasing - SG 'A' actual feed flow > steam flow
	SRO	Directs the BOP to take manual control of FCV-478 and reduce feed flow
	BOP	Take manual control of FCV-478 and reduce feed flow
		CRITICAL STEP TO TAKE MANUAL CONTROL OF FCV-478 AND CONTROL FEED FLOW TO PREVENT HIGH-HIGH LEVEL TRIP.
	BOP	Restore SG 'A' level with feed flow and steam flow matched

Op-Test Number: ________ Scenario Number: 3 Event Number: 2

Event Description: ***Controlling channel of SG A feed flow fails low***

Time	Position	Applicant's Actions or Behaviors
	SRO	Refer to OWP-RP for SG 'A' feed flow failure (SF/FF Loop 1)
	BOP	Selects Channel 476 for control in accordance with OWP-RP
	SRO	Refers to TS 3.3.1 (6 hour requirement to trip bistables)
	SRO	Initiate a WR/JO

Op-Test Number: ______	Scenario Number: 3	Event Number: 3
Event Description: ***Trip of CSIP A***		

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnose a trip of CSIP A - CSIP breaker indication - CHARGING PUMP DISCH HEADER HIGH-LOW FLOW (ALB-006-1-1) alarming - CHRG PUMPS A TROUBLE (ALB-006-1-2) alarming - CHRG PUMPS A TRIP OR CLOSE CKT TROUBLE (ALB-006-1-3) alarming - RCP SEAL WATER INJECTION LOW FLOW (ALB-008-2-1) alarming - Low charging flow indication on FI-122 - Low seal injection flow
	SRO	Enter and direct the actions of AOP-018
	RO	Monitor RCP parameters and verify no AOP-018 trip criteria met
	RO	Isolate letdown
	SRO	Start CSIP 1B-SB per AOP-018, Attachment 4

Op-Test Number: ________ Scenario Number: 3 Event Number: 3

Event Description: ***Trip of CSIP A***

Time	Position	Applicant's Actions or Behaviors
	RO	Restore seal injection in accordance with AOP-018
	RO	Restore Letdown and charging per OP-107
	RO	Restore PRZ level to program
	SRO	Refer to TS 3.1.2.4 and 3.5.2 (both 72 hour)
	SRO	Initiate a WR/JO

Op-Test Number: ________ Scenario Number: 3 Event Number: 4

Event Description: ***VCT level channel LT-112 failed high***

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnose high failure of LT-112 - Unexpected automatic makeup as level decreases to 20% - 1CS-120, LCV-115A diverting to RHT - VCT level decreasing - COMPUTER ALARM CHEM & VOL SYSTEMS (ALB-007-5-1) alarming
	SRO	Enter and direct the actions of AOP-003
	RO	Control VCT level using LT-115 indications
	RO	Align letdown to the VCT by taking 1CS-120 to the VCT position
	SRO	Direct maintenance to simulate low-low level for LT-112
	SRO	Initiate a WR/JO

Op-Test Number: ________ Scenario Number: 3 Event Number: 5

Event Description: ***Partial loss of condenser vacuum***

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnoses lowering main condenser vacuum - Decreasing Condenser vacuum indication on MCB - CNDSR PRE TRIP LOW VACUUM alarm (ALB-020-2-4A) alarming - COMPUTER ALARM MS/TURBINE SYSTEMS (ALB-020-5-5) alarming
	SRO	Enters and directs the actions of AOP-012
	BOP	Monitors for turbine trip requirements and determines turbine trip not required
	BOP	Reduce Turbine load as necessary to maintain condenser vacuum per GP-006
	RO	Control reactivity during power reduction by adjusting rods and/or boron concentration as necessary

Op-Test Number: ________ Scenario Number: 3 Event Number: 5

Event Description: ***Partial loss of condenser vacuum***

Time	Position	Applicant's Actions or Behaviors
	BOP	Start the standby Condenser Vacuum pump
	BOP	Verify condenser vacuum breakers are shut
	SRO	Direct an AO to locally check for cause of loss of vacuum by performing AOP-012, Attachment 1
		NOTE TO SIMULATOR OPERATOR: AFTER POWER HAS BEEN REDUCED SEVERAL PERCENT IN RESPONSE TO LOWERING VACUUM, REMOVE MALFUNCTION.
		NOTE: Several minutes after removing malfunction, report as AO that air inleakage was apparently cause and 1AE-29, 1AE-46, 1AE-48, and 1AE-49 have been closed. Noise level in area has decreased substantially.
	BOP	Verify all available Circulating Water pumps running

Op-Test Number: ________ Scenario Number: 3 Event Number: 5

Event Description: ***Partial loss of condenser vacuum***

Time	Position	Applicant's Actions or Behaviors
	BOP	Determine that condenser vacuum is being restored to normal
	SRO	Direct RO and BOP to restore turbine load per GP-005, if desired
	SRO	Initiate a WR/JO

Op-Test Number: ________ Scenario Number: 3 Event Number: 6

Event Description: ***Main steamline break inside of Containment with failure of Reactor to Trip from Control Room***

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnoses Main Steam break inside containment - Reactor power increasing - Steam flow increasing - Feed flow increasing - SG levels decreasing after initial swell - Steam pressure decreasing - RCS temperature decreasing - Containment pressure increasing - Containment radiation levels unchanged
	SRO	Orders a reactor trip and safety injection
		NOTE: Due to the failure of the automatic and manual reactor trip, a safety injection is likely to occur before the reactor can be tripped locally.
	RO	Determines reactor failed to automatically trip - Reactor trip breakers closed - Rod bottom lights off - Neutron flux NOT decreasing
	RO	Attempts manual trip of reactor

Op-Test Number: ________ Scenario Number: 3 Event Number: 6

Event Description: ***Main steamline break inside of Containment with failure of Reactor to Trip from Control Room***

Time	Position	Applicant's Actions or Behaviors
	RO	Determines manual trip NOT successful - Reactor trip breakers closed - Rod bottom lights off - Neutron flux NOT decreasing
	RO	Informs SRO of failure of reactor to trip automatically or manually
	SRO	Transitions to and directs the actions of FRP-S.1

Op-Test Number: ______ Scenario Number: 3 Event Number: 6

Event Description: ***Main steamline break inside of Containment with failure of Reactor to Trip from Control Room***

Time	Position	Applicant's Actions or Behaviors
	RO	Verifies rods inserting automatically OR manually inserts control rods
	SRO	Directs operator to contact OR report to Control Room
		CRITICAL STEP TO DIRECT A LOCAL REACTOR TRIP TO ADD NEGATIVE REACTIVITY TO CORE. ***NOTE: After approximately 15 second delay, contact Control Room as the operator directed to contact / report.***
	SRO	Directs operator to locally trip the reactor by (order of preference): - Locally opening the reactor trip breakers - Locally trip both rod drive MG set generator output breakers. - Locally trip both rod drive MG set motor breakers
		NOTE: Approximately 30 seconds after being directed to locally trip the reactor, open the reactor trip breakers.

Op-Test Number: ______	Scenario Number: 3 Event Number: 6
Event Description:	***Main steamline break inside of Containment with failure of Reactor to Trip from Control Room***

Time	Position	Applicant's Actions or Behaviors
	BOP	Verifies turbine tripped - All turbine throttle valves shut - All turbine governor valves shut
	BOP	Verifies all AFW pumps running
	RO	If SI has NOT initiated, initiate Emergency Boration - Start a boric acid pump - Open 1CS-278, Emergency Boric Acid Addition valve - Verify ≥ 30 gpm emergency boration flow - Verify ≥ 30 gpm CSIP flow to RCS - Verify RCS pressure < 2335 psig
		CRITICAL STEP TO INITIATE EMERGENCY BORATION TO ENSURE NEGATIVE REACTIVITY BEING ADDED TO CORE <u>IF</u> SAFETY INJECTION HAS <u>NOT</u> ACTUATED.
		NOTE: SI is expected to have occurred, so the above step should NOT be critical.
	RO	Verify reactor tripped

Op-Test Number: ______ Scenario Number: 3 Event Number: 6

Event Description: ***Main steamline break inside of Containment with failure of Reactor to Trip from Control Room***

Time	Position	Applicant's Actions or Behaviors
	BOP	Verifies turbine tripped
	CREW	Begin monitoring of foldout for FRP-S.1
	BOP	Verifies proper operation of safeguards equipment per OMM-004
	RO	Controls AFW flow to intact SGs to maintain between 10% and 50%
		NOTE: May recognize that steam break is on SG 'C' by this time, particularly if MS Isolation has occurred, and choose to isolate AFW to SG 'C'.
	SRO RO	Verify All Dilution Paths Isolated - Reactor Makeup Water pumps OFF - FCV-114B, Reactor Makeup Water valve SHUT - 1CS-98, BTRS Bypass valve OPEN - Direct AO to locally verify 1CS-510, Boric Acid Batch Tank Outlet valve SHUT

Op-Test Number: ________ Scenario Number: 3 Event Number: 6

Event Description: ***Main steamline break inside of Containment with failure of Reactor to Trip from Control Room***

Time	Position	Applicant's Actions or Behaviors
	RO	Checks for positive reactivity addition due to cooldown - Reactor tripped - Intermediate range startup rate positive
	BOP	Verifies MSIVs and bypass valves closed
	BOP	Determines SG 'C' faulted due to SG pressure decreasing in an uncontrolled manner or completely depressurized
	BOP	Determines SG 'A' and SG 'B' NOT faulted

Op-Test Number: ________ Scenario Number: 3 Event Number: 6

Event Description: ***Main steamline break inside of Containment with failure of Reactor to Trip from Control Room***

Time	Position	Applicant's Actions or Behaviors
	RO	Isolates SG 'C' - Verifies PORV closed - Verifies FW Isolation closed - Verifies AFW isolated to SG - Closes steam supply to TDAFW Pump - Directs AO to locally open breaker for 1MS-72 - Verifies before seat drain isolation closed - Verifies SG blowdown isolation closed - Verifies steam analyzer isolation closed - Verifies chemical addition isolations closed
		CRITICAL STEP TO ISOLATE SG 'C' PRIOR TO EXITING FRP-S.1 TO MINIMIZE PRESSURE RISE INSIDE CONTAINMENT.
	RO	Verifies core exit thermocouples < 1200 °F
	RO	Verify reactor subcritical - Power ranges < 5% - Intermediate startup rate negative
	SRO	Implements FRPs, as required

Op-Test Number: ______ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	SRO	Transitions to and directs the actions of FRP-J.1 based on MAGENTA path on Containment CSFST
		NOTE: The SRO may have previously informed of failure of Containment Spray during verification of safeguards actuations.
	BOP	Verifies Phase A isolation valves closed
	BOP	Verifies Containment Vent isolation valves closed
	RO	Verifies Containment Spray required due to pressure > 10 psig
	RO	Determines Containment Spray pumps NOT running AND starts both pumps
		CRITICAL STEP TO START PUMPS PRIOR TO EXITING FRP-J.1 TO REDUCE CONTAINMENT PRESSURE.

Op-Test Number: ________ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	RO	Verifies RWST > low-low level switchover requirement
	RO	Determines Containment Spray valves NOT properly aligned and opens the following valves: - 1CT-50 - 1CT-88 - 1CT-11 - 1CT-12 ***NOTE: 1CT-26 and 1CT-71 are already open.***
		CRITICAL STEP TO ALIGN VALVES PRIOR TO EXITING FRP-J.1 TO REDUCE CONTAINMENT PRESSURE.
	BOP	Verifies Phase B isolation

Op-Test Number: ______	Scenario Number: 3 Event Number: 7
Event Description:	***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	RO	Stop all RCPs
		CRITICAL STEP TO STOP RCPs PRIOR TO EXITING FRP-J.1 TO PROTECT PUMPS DUE TO LOSS OF COOLING FLOW.
	RO	Verifies proper operation of containment fan coolers
	BOP	Verifies MSIVs and bypasses closed
	BOP	Determines SG 'C' is only faulted SG and verifies isolated
	RO	Verifies both ESW booster pumps running with orifice bypass isolations closed

Op-Test Number: ________ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	BOP	Aligns hydrogen monitoring system and determines containment hydrogen concentration
	SRO	Transitions to and directs the actions of EOP PATH-1
	RO	Verifies reactor tripped
	BOP	Verifies turbine tripped
	BOP	Verifies power to AC safeguards buses

Op-Test Number: ______	Scenario Number: 3	Event Number: 7
Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***		

Time	Position	Applicant's Actions or Behaviors
	RO	Verifies SI actuated
	CREW	Begins monitoring of Foldout A
	CREW	Verifies proper operation of emergency safeguards equipment
	RO	Verifies proper containment isolation
	BOP	Verifies proper FW isolation

Op-Test Number: ________ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	BOP	Verifies FW pumps tripped
	BOP	Verifies AFW pumps running
	BOP	Verifies main steam line isolation
	BOP	Verifies both EDGs running
	BOP	Verifies proper operation of containment fan coolers

Op-Test Number: ________ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	RO	Verifies containment ventilation isolation
	BOP	Verifies control room ventilation aligned for emergency recirculation
	RO	Verifies proper SI flow - Greater than 200 gpm - RCS > 190 psig
	BOP	Verifies adequate AFW flow and alignment with flow isolated to SG 'C'
	BOP	Controls AFW flow to SGs 'A' and 'B'

Op-Test Number: ______ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	BOP	Verifies proper SI alignment
	RO	Resets SI
	CREW	Manually realigns equipment as time permits
	RO	Resets Phase A, Phase B, and FWI signals
	BOP	Energizes AC Buses 1A1 and 1B1

Op-Test Number: ________ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	RO	Establishes IA and nitrogen to containment
	BOP	Aligns containment hydrogen monitoring as time permits
	BOP	Aligns control room ventilation as time permits
	BOP	Resets MSRs
	RO	Attempts to stablize RCS temperature ***NOTE: Due to faulted SG, RCS temperature is expected to be low.***

Op-Test Number:	________	Scenario Number:	3	Event Number:	7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	RO	Verifies proper operation of PRZ PORVs ***NOTE: Spray valves not required due to no RCPs running.***
	RO	Maintains RCP seal injection within normal range
	SRO	Determines SG 'C' faulted and transitions to and directs the actions of EPP-014
		NOTE: SG should already have been isolated per directions of FRP-S.1.
	SRO	Determines SI has not been terminated and transitions to PATH-1, Entry Point C

Op-Test Number: ________ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	CREW	Begins monitoring of Foldout A and Foldout B
	RO	Aligns sampling
	CREW	Determines SI Termination Criteria are met - Subcooling - Heat Sink - RCS Pressure - RCS Inventory
		NOTE: SI Termination Criteria will be met only after the faulted SG has completed blowing dry.
		CRITICAL TO TERMINATE SAFETY INJECTION TO PREVENT RCS OVERFILL AND PRESSURIZATION RESULTING IN CHALLENGING PRZ PORVs AND/OR SAFETIES.
	SRO	Transitions to and directs the actions of EPP-008

Op-Test Number: ________ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	RO	Stops all but 1 CSIP
	SRO	Determines RCS pressure stable or increasing
	RO	Opens normal miniflow isolation valves
	RO	Isolates high head SI flow
	RO	Establishes charging lineup
	RO	Controls charging to maintain pressurizer level

Op-Test Number: ________ Scenario Number: 3 Event Number: 7

Event Description: ***Failure Of Containment Spray (Auto and Manual Actuation), requiring manual component alignment***

Time	Position	Applicant's Actions or Behaviors
	RO	Stops RHR Pumps
		NOTE: Pumps may have been previously stopped.
	CREW	Determines SI Reinitiation Criteria not met
		TERMINATE THE SCENARIO AFTER VERIFYING SI REINITIATION CRITERIA NOT MET.

Op-Test Number: ______ Scenario Number: 3 Event Number: 8

Event Description: ***Classify the Event***

Time	Position	Applicant's Actions or Behaviors
	SRO	Classifies the event as a Site Area Emergency (EAL 8-1-3)
		NOTES: ***1) Based on failure of reactor to automatically trip or trip from either switch in control room (only a Site Area Emergency until reactor locally tripped).*** ***2) Classification of the event following the scenario is considered 20% of the Performance Rating for JPM SRO-A.4.***

Facility:	SHNPP	Scenario Number:	SPARE	Op-Test Number:	2000-301

Examiners

Operators

Objectives: To evaluate the candidates' ability to shift operating CW pumps, respond to a failure of the Letdown Pressure controller, a trip of the running CSIP, a SG steam flow channel failure, and a Heater Drain Pump Trip with a failure of the turbine to automatically runback. To evaluate the candidate's implementation of emergency operating procedures in response to a small break loss of coolant accident concurrent with a Loss of Offsite Power. Post-trip evaluation will determine the candidates' ability to respond to a failure of the remaining available CSIP to automatically start.

Initial Conditions: IC-20. 100% power EOL. CW Pump C is secured. HD Pump A is secured.

Turnover: 100% power, EOL.

Main Condenser Vacuum Pump B is out of service to allow maintenance to troubleshoot a high vibration condition. Heater Drain Pump 1A is out of service for oil replacement.

Boron concentration is 241 ppm. Bank D rods are at 218 steps.

Shift orders are to maintain power at 100%. Place CW Pump C in service and secure CW Pump A to allow maintenance to perform electrical checks on CW Pump A breaker. Restore Heater Drain Pump 1A to service when maintenance completes work.

Event Number	Malfunction Number (1)	Event Type*	Event Description
1	NA	BOP(N) SRO(N)	Shift Operating CW Pumps per OP-138.01
2	PT:145 0 0	RO(I) SRO(I)	Low failure of Letdown Pressure Transmitter PT-145
3	CVC05A	RO(C) SRO(C)	Trip of CSIP A

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

(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Event Number	Malfunction Number (1)	Event Type*	Event Description
4	FT:484 5	BOP(I) SRO(I)	SG B steam flow channel failed high
5	CFW12B	BOP(C) SRO(C)	Trip of HDP 1B
	PT:1006 0 0	BOP(C) SRO(C)	PS-1006 failed in it's low pressure state resulting in a failure of the automatic turbine runback to occur
	NA	RO(R) SRO(R)	Reactivity control of reactor during/following the power reduction
6	RCS18C 10 600	RO(M) BOP(M) SRO(M)	SB LOCA inside containment concurrent with Loss of Offsite Power
	EPS01 (E40 30 0) 1	RO(M) BOP(M) SRO(M)	(Loss of Offsite Power)
7	ZDSQ94:4B FAIL_ASIS	RO(C) SRO(C)	CSIP-B fails to autostart following SI concurrent with Loss of Offsite Power
8	NA	SRO	Classify the Event

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

(1) See Attachment, "Simulator Setup & Actions Required for Scenario," for details on setup.

Simulator Setup & Actions Required for Scenario # SPARE

Event Number	Simulator Operator Actions
INITIAL CONDITIONS	IC-20, 100% power. Set pots BORON 0.79, RMUW 7.5. Press START on scaler timer. Equipment OOS is HDP 'A'. Rackout breaker and hang tags. • MRF CND065 RACK_OUT Equipment OOS is Vacuum Pump 'B'. Rackout breaker and hang tags. • IOR XB2I117 STOP • IOR XB2O117G OFF • IOR XB2O128G OFF • IOR XB2O128C OFF Lower reactor power to 100%. Part of Malfunction for Event 5 ACTIVE AT SETUP • ICOR PT:1006 0 0
1	NONE
2	TRG E2 = ICOR PT:145 0 0
3	TRG E3 = IMF CVC05A
4	TRG E4 = ICOR FT:484 5
5	TRG E5 = IMF CFW12B Part of Malfunction ACTIVE AT SETUP • ICOR PT:1006 0 0
6	TRG E6 = IMF RCS18C 10 600 TRG E40 JPPLP4.DSS IMF EPS01 (E40 30 0) 1
7	ICOR ZDSQ94:4B FAIL_ASIS

SHIFT TURNOVER SCENARIO # SPARE

100% power, EOL.

Main Condenser Vacuum Pump B is out of service to allow maintenance to troubleshoot a high vibration condition. Heater Drain Pump 1A is out of service for oil replacement.

Boron concentration is 241 ppm. Bank D rods are at 218 steps.

Shift orders are to maintain power at 100%. Place CW Pump C in service and secure CW Pump A to allow maintenance to perform electrical checks on CW Pump A breaker. Restore Heater Drain Pump 1A to service when maintenance completes work.

Op-Test Number: ______ Scenario Number: Spare Event Number: 1

Event Description: ***Shift Operating CW Pumps per OP-138.01***

Time	Position	Applicant's Actions or Behaviors
	SRO	Direct the actions of OP-138.01
	SRO	Reviews Precautions and Limitations with crew
	BOP	Directs AO to perform pre-startup checklist for CW pump 'C'
		NOTE: AO reports pre-startup checklist completed.
	BOP	Verifies CW pump 'C' discharge valve closed
	BOP	Starts CW pump 'C'

Op-Test Number:	______	Scenario Number:	Spare	Event Number:	1

Event Description: ***Shift Operating CW Pumps per OP-138.01***

Time	Position	Applicant's Actions or Behaviors
	BOP	Verifies discharge valve begins opening 10 seconds after pump start
	BOP	Verifies proper operation of CW pump 'C'
	BOP	Places control switch for CW pump 'A' to stop
	BOP	Verifies CW pump 'A' discharge valve begins closing
	BOP	Verifies CW pump 'A' stops when discharge valve 20% open
	BOP	Verifies CW pump 'A' discharge valve closes fully

Op-Test Number: ________ Scenario Number: Spare Event Number: 2

Event Description: ***Low failure of Letdown Pressure Transmitter PT-145***

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnoses low failure of PT-145 - PI-145 indicating 0 psig - PK-145 output at minimum - FI-150.1, Letdown flow, indicating 0 gpm - LP LETDOWN RELIEF LINE HIGH TEMP (ALB-007-3-1) alarming
	SRO	Direct crew in response to PCV-145 failure
	RO	Isolates letdown OR operates PCV-145 in manual per ALB-007-3-1
		NOTE: Either action is acceptable, but charging flow must be isolated if letdown is isolated.
	RO	Isolates charging flow if letdown isolated and places excess letdown in service, if desired
	SRO	Initiates a WR/JO

Op-Test Number: ________ Scenario Number: Spare Event Number: 3

Event Description: ***Trip of CSIP A***

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnose a trip of CSIP A - CSIP breaker indication - CHARGING PUMP DISCH HEADER HIGH-LOW FLOW (ALB-006-1-1) alarming - CHRG PUMPS A TROUBLE (ALB-006-1-2) alarming - CHRG PUMPS A TRIP OR CLOSE CKT TROUBLE (ALB-006-1-3) alarming - RCP SEAL WATER INJECTION LOW FLOW (ALB-008-2-1) alarming - Low charging flow indication on FI-122 - Low seal injection flow
	SRO	Enter and direct the actions of AOP-018
	RO	Monitor RCP parameters and verify no AOP-018 trip criteria met
	RO	Isolate letdown due to high temperature, if not previously isolated
	SRO	Start CSIP 1B-SB per AOP-008, Attachment 4

Op-Test Number: ______	Scenario Number: Spare	Event Number: 3
Event Description: ***Trip of CSIP A***		

Time	Position	Applicant's Actions or Behaviors
	RO	Restore seal injection in accordance with AOP-018
	RO	Restore Letdown and charging per OP-107, if required.
	RO	Restore PRZ level to program
	SRO	Refer to TS 3.1.2.4 and 3.5.2 (both 72 hour)
	SRO	Initiate a WR/JO

Op-Test Number:		Scenario Number: Spare		Event Number: 4	
Event Description: **_SG B steam flow channel failed high_**					

Time	Position	Applicant's Actions or Behaviors
	BOP	Diagnose high failure of controlling SG 'B' steam flow channel - SG B LEVEL DEVIATION (ALB-014-1-2B) alarming - SG 'B' actual feed flow > steam flow - SG 'B' feed reg valve opening - SG 'B' level increasing
	SRO	Directs the BOP to take manual control of FCV-488 and reduce feed flow
	BOP	Takes manual control of FCV-488 and reduces feed flow
		CRITICAL STEP TO TAKE MANUAL CONTROL OF FCV-488 AND CONTROL FEED FLOW TO PREVENT HIGH-HIGH LEVEL TRIP.
	BOP	Restore SG 'B' level with feed flow and steam flow matched

Op-Test Number: ________ Scenario Number: Spare Event Number: 4

Event Description: ***SG B steam flow channel failed high***

Time	Position	Applicant's Actions or Behaviors
	SRO	Refer to OWP-RP for SG 'B' steam flow failure (SF/FF Loop 2)
	BOP	Selects alternate Channel for control in accordance with OWP-RP
	SRO	Refers to TS 3.3.1 (6 hour requirement to trip bistables)
	SRO	Initiate a WR/JO

Op-Test Number: ________ Scenario Number: Spare Event Number: 5

Event Description: ***Trip of HDP B with Failure of Turbine to Automatically Runback***

Time	Position	Applicant's Actions or Behaviors
		NOTE TO SIMULATOR OPERATOR: ENSURE ALL FEED REG VALVES HAVE BEEN RETURNED TO AUTOMATIC CONTROL PRIOR TO INSERTING THIS EVENT.
	CREW	Diagnoses trip of Heater Drain Pump 'B' - HTR DRN PUMP B O/C TRIP-GND (ALB-019-3-1A) alarming - HTR DRN PUMP B LO DP-LO FLOW (ALB-019-3-1A) alarming - SG levels decreasing - Reactor Power increasing
	SRO	Enters and directs the actions of AOP-010
	BOP	Identifies failure of turbine runback to occur
	SRO	Directs power reduction to less than 90%
	BOP	Lowers turbine load to < 90%

Op-Test Number: ______	Scenario Number: Spare	Event Number: 5
Event Description: ***Trip of HDP B with Failure of Turbine to Automatically Runback***		

Time	Position	Applicant's Actions or Behaviors
	BOP	Adjusts turbine load as necessary to maintain FW pump suction pressure > 300 psig
	RO	Controls reactivity during rapid load reduction by adjusting rods and/or boron concentration as necessary
	SRO	Notifies Load Dispatcher of power limitations
	BOP	Initiates a WR/JO

Op-Test Number: ________ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	CREW	Diagnoses leakage from RCS to containment - PRESSURIZER CONTROL LOW LEVEL DEVIATION (ALB-009-2-2) alarming - COMPUTER ALARM CHEM & VOL SYSTEMS (ALB-007-5-5) alarming - CONTAINMENT UNIDENTIFIED LEAKAGE/OR TROUBLE (ALB-001-6-1) alarming - Charging flow greater than letdown flow with constant Tavg and PRZ level - Increased VCT makeup system operation - CNMT leak detection radiation monitor trends increasing - CNMT temperature/pressure increasing - CNMT area radiation monitors increasing - CNMT sump pump operation increasing - CNMT sump level increasing
	SRO	Enters and directs the actions of AOP-016
	SRO	If RCS leakage is determined to be greater than automatic OR manual VCT makeup capability: - Trip the reactor - Manually initiate safety injection - Go To EOP Path-1

Op-Test Number: ________ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
		NOTE: The following actions, up to ordering a manual reactor trip and safety injection, may OR may not be performed, depending upon the time taken to perform actions AND / OR the SRO's judgement.
	RO	Verifies Reactor Makeup Control System operates to maintain VCT level
	RO	Maintains PRZ level by adjusting charging flow and isolating letdown, if necessary
	RO	Verifies sampling system is isolated
	RO	Attempt to determine RCS leak rate
		NOTE: May be difficult to estimate leak rate due to size of leak causing change in charging flow and pressurizer level.
	SRO	If time permits, refer to TS 3.4.6.2 for leakage limitations

Op-Test Number: ________	Scenario Number: Spare	Event Number: 6
Event Description:	***SB LOCA inside containment concurrent with Loss of Offsite Power***	

Time	Position	Applicant's Actions or Behaviors
	SRO	Notify radiological personnel of RCS leakage
	RO	Verifies containment purge is secured
	SRO	Directs manual reactor trip and safety injection
	SRO	Enters and directs the actions of EOP PATH-1
		NOTE TO SIMULATOR INSTRUCTOR: MALF FOR LOSS OF OFFSITE POWER AND EVENT 7 (FAILURE OF CSIP 'B' TO AUTO START) SHOULD BE ENTERED TO OCCUR CONCURRENTLY WITH MANUAL REACTOR TRIP.

Op-Test Number: ______ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	SRO	Initiates monitoring of CSFSTs
	RO	Manually trips the reactor and manually initiates safety injection
	BOP	Verifies main turbine tripped
	BOP	Determines 1A-SA and 1B-SB powered from EDGs following loss of offsite power
	RO	Determines SI manually actuated
	CREW	Begin monitoring of Foldout A

Op-Test Number: ________ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	RO	Verifies both RHR pumps running
	RO	Determines no CSIPs running and manually starts CSIP 'B' after verifying load sequence complete
		CRITICAL STEP TO START CSIP 'B' PRIOR TO SATURATION CONDITIONS BEING REACHED IN RCS.
		Verifies the following: - CSIP 1B-SB and RHR pumps running - 2 CCW pumps running - All ESW and ESW booster pumps running - Containment pressure below 10 psig - Phase A isolation valves shut - SGBD and sample isolation valves shut - FW isolation has occurred
	BOP	Verifies both MDAFW pumps running
	BOP	Verifies MSL isolation NOT required and MSL isolation valves open

Op-Test Number: ________ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	BOP	Verifies the following: - Both EDGs running - Containment Fan Coolers running in slow speed - CV isolation has occurred - CR ventilation aligned for emergency recirc
	RO	Verify proper SI alignment - SI flow > 200 gpm - RCS pressure > 190 psig
	BOP	Verifies adequate AFW flow and/or adequate SG level, determines AFW valves properly aligned, and controls AFW flow to maintain proper SG level
	RO	Verifies proper SI alignment
	RO	Resets SI, Phase A, Phase B, and FW isolation
	BOP	Energize AC buses 1A1 and 1B1

Op-Test Number: ______ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	BOP	Establish instrument air and nitrogen to containment
	SRO	Directs AO to place IA compressors in LOCAL
	BOP	Align Containment Hydrogen Monitoring and Control Room Ventilation
	RO	Reset MSRs
	RO	Stabilizes RCS temperature at no-load conditions
	RO	Ensure all unisolated PRZ PORVs shut

Op-Test Number: ______ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	RO	Control RCS pressure and maintain normal seal injection
	CREW	Determine NO SG depressurizing in an uncontrolled manner or completely depressurized
	CREW	Determine NO ruptured SGs exist
	CREW	Determine the RCS is NOT intact
	SRO	Begin implementation of CSFSTs
	CREW	Begin monitoring of both Foldout A and B

Op-Test Number: ________ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	RO	Aligns and obtains RCS and SG samples
	RO	Maintains seal injection flow in proper range
	BOP	Controls AFW flow to the SGs to maintain 10% to 50%
	RO	Verifies proper alignment and operation of PRZ PORVs
	CREW	Determines SI Termination criteria NOT met due to any or all of the following: - Inadequate RCS subcooling - RCS pressure decreasing - Inadequate PRZ level

Op-Test Number: ________ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	RO	Determines Containment Spray system status and secures Containment Spray, if running, when conditions permit
	RO	Verifies Source Range instruments energized
	RO	If RCS pressure has stablized above 190 psig, stops both RHR pumps
	RO	Establishes CCW flow to the RHR heat exchangers
	BOP	Verifies proper operation of the EDGs and proper loading
	SRO	Verifies cold leg recirculation capabilities are met

Op-Test Number: ________ Scenario Number: Spare Event Number: 6

Event Description: ***SB LOCA inside containment concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
	SRO	Transition to and direct the actions of EPP-009
		TERMINATE THE SCENARIO WHEN A TRANSITION HAS BEEN MADE TO EPP-009.

Op-Test Number: ________ Scenario Number: Spare Event Number: 7

Event Description: ***CSIP-B fails to autostart following SI concurrent with Loss of Offsite Power***

Time	Position	Applicant's Actions or Behaviors
		NOTE: ACTIONS FOR EVENT 7 ARE PERFORMED AS PART OF RESPONSE DURING EVENT 6.

Op-Test Number: ________ Scenario Number: Spare Event Number: 8

Event Description: ***Classify the Event***

Time	Position	Applicant's Actions or Behaviors
	SRO	Classifies the event as a Site Area Emergency (EAL 2-1-3)
		NOTES: ***1) Based on RCS Breached AND Containment Jeopardized.*** ***2) Classification of the event following the scenario is considered 20% of the Performance Rating for JPM SRO-A.4.***