Draft Submittal

(Pink Paper)

1. Administrative Questions/JPMs
2. In-plant JPMs
3. Control Room JPMs (simulator JPMs)
4. Administrative Topics Outline ES-301-1 R0/S20
5. Control Room Systems and Facility Walk-Through Test Outline ES-301-2 R0/S20-1/S20-4
6. Written Exam Sample Outlines

SURRY EXAM 2002-301

50-280, 281/2002-301
MARCH 18 - 28, 2002

Facility: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Examination Level (circle one): RO / **SRO** Operating Test Number: 2

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1		Take actions IAW OPAP-0008 for mis-positioned locked valve that makes TS system inoperable. (KA2.1.33)(SRO)
		Obtain VCT trend from computer and determine estimated leak rate. (KA2.1.19)(RO&SRO)
A.2		Determine that work order cannot be released due to improper plant conditions for PMT. (KA2.2.17)(SRO)
A.3		Determine pathway to and from work site that yields the lowest dose using a survey map. (KA2.3.10)(SRO)
A.4		Notification determination IAW EPIP 1.01(KA2.4.41)(SRO)

Facility: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Examination Level (circle one): (RO) / SRO Operating Test Number: 1

Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1		Perform valve position verifications (KA2.1.29)(RO)
		Obtain VCT trend from computer and determine estimated leak rate. (KA2.1.19)(RO&SRO)
A.2		Perform component tag out (KA2.2.13)(RO)
A.3		Perform Attachment 1 of 0-OSP-RC-002, Primary to Secondary leakrate using condenser air ejector rad monitor.(KA2.3.11)(RO)
A.4		Stability Class Calculation IAW EPIP 2.01(KA2.4.39)(RO)

Facility: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Exam Level (circle one): **RO** / SRO(I) / SRO(U) Operating Test No.: 1

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. Perform the Immediate Operator actions for Loss of Main Feedwater flow (Facility # LO26.08)	S, D	4s (KA054AA2.02)
b. Recover dropped control rod (Facility # LO65.03)	S, D	1 (KA001K4.09)
c. Verify Natural Circulation Flow w/ flow not occurring and Steam Dump failure (Facility #LO38.03)	S, A, M (Significant Modification)	2 (KA002A4.02)
d. Transfer to cold leg recirc w/ RMT functional and MOV1860B failing to open (Facility #LO52.01)	S,A,M (Significant Modification)	3 (KA011EA1.11)
e. RHR pump vortexing at mid-loop(Facility #LO40.5)	S, D, L	4p (KA025AA2.07)
f. Respond to #3 EDG failure to load (Facility #LO55.06)	S,D	6 (KA064A4.06)
g. Perform CLS Component Verification (E-0, attachment 1), w/ A CTMT air recirc fan failing to trip (Facility #LO67.01)	S,A,M	5 (KA022A3.01, A4.01)

B.2 Facility Walk-Through

a. Cross-tie Unit 1 emergency busses to restore Instrument Air (Facility #LO35.03)	D	6 (KA056AA1.37)
b. Locally start the Emergency SW Pumps and mitigate overtemperature condition. (Facility #13.02)	D,M,A	4s (KA076A2.01)
c. Makeup to the Unit 2 RWST from the Spent Fuel Pit (Facility #53.01B)	D, R	2 (KA006A2.02)

* 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: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Exam Level (circle one): RO / **SRO(I)** / SRO(U) Operating Test No.: 1

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a. Perform the Immediate Operator actions for Loss of Main Feedwater flow (Facility # LO26.08)	S, D	4s (KA054AA2.02)
b. Recover dropped control rod (Facility # LO65.03)	S, D	1 (KA001K4.09)
c. Verify Natural Circulation Flow w/ flow not occurring and Steam Dump failure (Facility #LO38.03)	S, A, M (Significant Modification)	2 (KA002A4.02)
d. Transfer to cold leg recirc w/ RMT functional and MOV1860B failing to open (Facility #LO52.01)	S,A,M (Significant Modification)	3 (KA011EA1.11)
e. RHR pump vortexing at mid-loop(Facility #LO40.5)	S, D, L	4p (KA025AA2.07)
f. Respond to #3 EDG failure to load (Facility #LO55.06)	S,D	6 (KA064A4.06)
g. Perform CLS Component Verification (E-0, attachment 1), w/ A CTMT air recirc fan failing to trip (Facility #LO67.01)	S,A,M	5 (KA022A3.01, A4.01)
B.2 Facility Walk-Through		
a. Cross-tie Unit 1 emergency busses to restore Instrument Air (Facility #LO35.03)	D	6 (KA056AA1.37)
b. Locally start the Emergency SW Pumps and mitigate overtemperature condition. (Facility #13.02)	D,M,A	4s (KA076A2.01)
c. Makeup to the Unit 2 RWST from the Spent Fuel Pit (Facility #53.01B)	D, R	2 (KA006A2.02)

* 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: Surry Power Station Date of Examination: Weeks of March 18 & 25, 2002
Exam Level (circle one): RO / SRO(I) / SRO(U) Operating Test No.: 2-U

B.1 Control Room Systems

System / JPM Title	Type Code*	Safety Function
a.		
b. Recover dropped control rod (Facility # LO65.03)	S, D	1 (KA001K4.09)
c. Verify Natural Circulation Flow w/ flow not occurring and Steam Dump failure (Facility #LO38.03)	S, A, M (Significant Modification)	2 (KA002A4.02)
d. Transfer to cold leg recirc w/ RMT functional and MOV1860B failing to open (Facility #LO52.01)	S,A,M (Significant Modification)	3 (KA011EA1.11)
e.		
f.		
g.		

B.2 Facility Walk-Through

a. Cross-tie Unit 1 emergency busses to restore Instrument Air (Facility #LO35.03)	D	6 (KA056AA1.37)
b. Locally start the Emergency SW Pumps and mitigate over temperature condition. (Facility #13.02)	D,M,A	4s (KA076A2.01)
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

Draft Submittal
(Pink Paper)

1. Written Exam Sample outlines

SURRY EXAM 2002-301

50-280, 281/2002-301
MARCH 18 - 28, 2002

Facility: Surry Date of Exam: 3/02 Exam Level: SRO

Tier	Group	K/A Category Points											Point Total
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	2	3				3	9			4	24
	2	1	1	2				1	8			3	16
	3	0	0	1				0	1			1	3
	Tier Totals	4	3	6				4	18			8	43
2. Plant Systems	1	1	2	2	2	1	1	1	2	2	2	3	19
	2	1	1	1	0	1	1	1	5	1	1	4	17
	3	0	0	0	0	1	0	0	2	1	0	0	4
	Tier Totals	2	3	3	2	3	2	2	9	4	3	7	40

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

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 100 points.
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.

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1	X				X		AA2.03 Proper actions to be taken if automatic safety functions have not taken place (SRO Only) AA1.06 Rod transfer switches	4.5/4.8 3.0/2.9	2
000003 Dropped Control Rod / 1		X					AK2.05 Control rod drive power supplies and logic circuits	2.5/2.8	1
000005 Inoperable/Stuck Control Rod / 1	X						AK1.02 Flux tilt	3.1/3.9	1
000011 Large Break LOCA / 3			X				EK3.03 Starting auxiliary feed pumps and flow, ED/G, and service water pumps	4.1/4.3	1
W/E04 LOCA Outside Containment / 3						X	2.2.22 Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations. (SRO only)	3.0/4.0	1
W/EO1 & E02 Rediagnosis & SI Termination / 3						X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (SRO only)	4.0/4.0	1
000015/17 RCP Malfunctions / 4		X					AK2.10 RCP indicators and controls	2.8/2.8	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0/4.3	1
000024 Emergency Boration / 1	X						AK1.04 Low temperature limits for boron concentration	2.8/3.6	1
000026 Loss of Component Cooling Water / 8					X		AA2.01 Location of a leak in the CCWS (SRO Only)	2.9/3.5	1
000029 Anticipated Transient w/o Scram / 1						X	2.2.25 Knowledge of bases in technical specifications for limiting conditions for operations and safety limits.(SRO only)	2.5/3.7	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4		X					AK2.02 Sensors and detectors	2.6/2.6	1
CE/A11; W/E08 RCS Overcooling - PTS / 4					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations.(SRO only)	3.4/4.2	1
000051 Loss of Condenser Vacuum / 4			X				AK3.01 Loss of steam dump capability upon loss of condenser vacuum	2.8/3.1	1
000055 Station Blackout / 6			X				EK3.02 Actions contained in EOP for loss of offsite and onsite power	4.3/4.6	1
000057 Loss of Vital AC Elec. Inst. Bus / 6				X			A1.06 Manual control of components for which automatic control is lost	4.0/4.3	1
000059 Accidental Liquid RadWaste Rel. / 9			X				AK3.03 Declaration that a radioactive-liquid monitor is inoperable	3.0/3.7	1
000062 Loss of Nuclear Service Water / 4				X			AA1.05 The CCWS surge tank, including level control and level alarms and radiation alarm	3.1/3.1	1
000067 Plant Fire On-site / 9	X						AK1.02 Fire fighting	3.1/3.2	1
000068 (BW/A06) Control Room Evac. / 8		X					AK2.03 Controllers and positioners	2.9/3.1	1
000069 (W/E14) Loss of CTMT Integrity / 5					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (SRO only)	3.3/3.8	1

000074 (W/**E06**&E07) Inad. Core Cooling / 4					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (SRO only)	3.4/4.2	1
BW/E03 Inadequate Subcooling Margin / 4							N/A		
000076 High Reactor Coolant Activity / 9				X			AA1.04 Failed fuel-monitoring equipment	3.2/3.4	1
BW/A02&A03 Loss of NNI-X/Y / 7							N/A		
K/A Category Totals:	3	2	3	3	9	4	Group Point Total:		24

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1						X	2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.4/3.7	1
BW/A01 Plant Runback / 1							N/A		
BW/A04 Turbine Trip / 4							N/A		
000008 Pressurizer Vapor Space Accident / 3					X		AA2.19 PZR spray valve failure, using plant parameters (SRO Only)	3.4/3.6	1
000009 Small Break LOCA / 3					X		EA2.04 PZR level (SRO Only)	3.8/4.0	1
BW/E08; W/E03 LOCA Cooldown - Depress. / 4						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (SRO only)	4.0/4.3	1
W/E11 Loss of Emergency Coolant Recirc. / 4				X			EA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.9/4.0	1
000022 Loss of Reactor Coolant Makeup / 2									
000025 Loss of RHR System / 4	X						AK1.01 Loss of RHRS during all modes of operation.	3.9/4.3	1
000027 Pressurizer Pressure Control System Malfunction / 3			X				AK3.01 Isolation of PZR spray following loss of PZR heaters.	3.5/3.8	1
000032 Loss of Source Range NI / 7		X					AK2.01 Power supplies, including proper switch positions	2.7/3.1	1
000033 Loss of Intermediate Range NI / 7						X	2.4.22 Knowledge of the bases for prioritizing safety functions during abnormal/emergency operations. (SRO Only)	3.0/4.0	1
000037 Steam Generator Tube Leak / 3					X		AA2.10 Tech-Spec limits for RCS leakage (SRO Only)	3.2/4.1	1
000038 Steam Generator Tube Rupture / 3			X				EK3.02 Prevention of secondary PORV cycling.	4.4/4.5	1
000054 (CE/E06) Loss of Main Feedwater / 4				X			AA1.02 Manual startup of electric and steam-driven AFW pumps.	4.4/4.4	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4					X		EA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (SRO only)	3.4/4.4	1
000058 Loss of DC Power / 6									
000060 Accidental Gaseous Radwaste Rel. / 9		X					AK2.02 Auxiliary building ventilation system	2.7/3.1	1
000061 ARM System Alarms / 7									
W/E16 High Containment Radiation / 9	X						EK1.3 Annunciators and conditions indicating signals, and remedial actions associated with the (High Containment Radiation).	3.0/3.3	1
000065 Loss of Instrument Air / 8					X		AA2.01 Cause and effect of low-pressure instrument air alarm (SRO Only)	2.9/3.2	1

CE/E09 Functional Recovery							N/A		
K/A Category Point Totals:	1	1	2	1	8	3	Group Point Total:		16

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2		X					AK2.03 Controllers and positioners	2.6/2.9	1
000036 (BW/A08) Fuel Handling Accident / 8									
000056 Loss of Off-site Power / 6			X				AK3.01 Order and time to initiation of power for the load sequencer	3.5/3.9	1
BW/E13&E14 EOP Rules and Enclosures									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
CE/A16 Excess RCS Leakage / 2									
W/E13 Steam Generator Over-pressure / 4						X	2.4.15 Knowledge of communications procedures associated with EOP implementation.(CFR: 41.10 / 45.13)	3.0/3.5	1
W/E15 Containment Flooding / 5									
K/A Category Point Totals:	0	0	1	0	1	1	Group Point Total:		3

System # / Name	K 1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
001 Control Rod Drive			X									K3.01 CVCS	2.9/3.0	1
003 Reactor Coolant Pump									X			A3.02 Motor current	2.6/2.5	1
004 Chemical and Volume Control		X										K2.04 BWST tank heaters	2.6/2.7	1
013 Engineered Safety Features Actuation											X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0/4.3	1
014 Rod Position Indication			X									K3.02 Plant Computer	2.5/2.8	1
015 Nuclear Instrumentation				X								K4.08 Automatic rod motion on demand signals	3.4/3.7	1
017 In-core Temperature Monitor	X								X			K1.01 Plant computer A3.01 Indications of normal, natural and interrupted circulation of RCS	3.2/3.2 3.6/3.8	2
022 Containment Cooling				X								K4.05 Containment cooling after LOCA destroys ventilation ducts	2.6/2.7	1
025 Ice Condenser												N/A		
026 Containment Spray							X					A1.01 Containment pressure	3.9/4.2	1
056 Condensate											X	2.1.32 Ability to explain and apply all system limits and precautions.	3.4/3.8	1
059 Main Feedwater											X	2.4.31 Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3/3.4	1
061 Auxiliary/Emergency Feedwater		X										K2.02 AFW electric drive pumps	3.7/3.7	1
063 DC Electrical Distribution								X		X		A2.01 Grounds A4.02 Battery voltage indicator	2.5/3.2 2.8/2.9	2
068 Liquid Radwaste						X						K6.10 Radiation Monitors	2.5/2.9	1
071 Waste Gas Disposal										X		A4.07 Waste Gas release flow meter	3.0/3.0	2
072 Area Radiation Monitoring					X			X				K5.02 Radiation intensity changes with source distance A2.02 Detector Failure	2.5/3.2 2.8/2.9	2
K/A Category Point Totals:	1	2	2	2	1	1	1	2	2	2	3	Group Point Total:		19

System # / Name	K1	K2	K3	K 4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						X						K6.03 Rx Vessel Level Indication	3.1/3.6	1
006 Emergency Core Cooling					X							5.10 Theory of thermal stress	2.5/2.9	1
010 Pressurizer Pressure Control								X				A2.03 PORV failures (SRO only)	4.1/4.2	1
011 Pressurizer Level Control			X									K3.02 RCS	3.5/3.7	1
012 Reactor Protection								X				A2.02 Loss of instrument power (SRO only)	3.6/3.9	1
016 Non-nuclear Instrumentation												No K/A's		0
027 Containment Iodine Removal												No K/A's		0
028 Hydrogen Recombiner and Purge Control												No K/A's		0
029 Containment Purge									X			A3.01 CPS isolation	3.8/4.0	1
033 Spent Fuel Pool Cooling	X											K1.05 RWST	2.7/2.8	1
034 Fuel Handling Equipment											X	2.1.27 Knowledge of system purpose and or function.	2.8/2.9	1
035 Steam Generator							X					A1.01 S/G Wide & Narrow Range during startup, shutdown and normal operation	3.6/3.8	1
039 Main and Reheat Steam										X		A4.04 Emergency Feedwater pump turbine	3.8/3.9	1
055 Condenser Air Removal											X	2.1.28 Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	3.2/3.3	1
062 AC Electrical Distribution								X				A2.04 Effect on plant of de-energizing a bus (SRO only)	3.4/3.1	1
064 Emergency Diesel Generator								X				A2.06 Operating unloaded, lightly loaded and highly loaded time limit	2.9/3.3	1
073 Process Radiation Monitoring											X	2.1.32 Ability to explain and apply all system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)	3.4/3.8	1
075 Circulating Water		X										K2.03 Emergency/essential SWS pumps	2.6/2.7	1

079 Station Air											X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (CFR: 41.10 / 43.2 / 45.6)	4.0/4.0	1
086 Fire Protection												None		
103 Containment								X				A2.05 Emergency containment entry (SRO only)	2.9/3.9	1
K/A Category Point Totals:	1	1	1	0	1	1	1	5	1	1	4	Group Point Total:		17

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal								X				A2.03 RHR pump/motor malfunction (SRO only)	2.9/3.1	1
007 Pressurizer Relief/Quench Tank														
008 Component Cooling Water								X				A2.01 Loss of CCW pump(SRO only)	3.3/3.6	1
041 Steam Dump/Turbine Bypass Control					X							K5.02 Use of steam tables for saturation temperature and pressure	2.5/2.8	1
045 Main Turbine Generator									X			A3.11 Generator trip	2.6/2.9	1
076 Service Water														
078 Instrument Air														
K/A Category Point Totals:	0	0	0	0	1	0	0	2	1	0	0	Group Point Total:		4

Plant-Specific Priorities

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

Facility: Surry	Date of Exam: 3/02		Exam Level: RO/SRO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements.	3.7/3.8	1/1
	2.1.4	Knowledge of shift staffing requirements.	2.3/3.4	0/1
	2.1.12	Ability to apply technical specifications for a system.	2.9/4.0	1/1
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits.	2.3/2.9	0/1
	2.1.			
	2.1.			
	Total			2/4
Equipment Control	2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report.	2.3/3.3	0/1
	2.2.13	Knowledge of tagging and clearance procedures.	3.6/3.8	1/1
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.5/3.3	1/1
	2.2.12	Knowledge of surveillance procedures.	3.0/3.4	1/1
	2.2.			
	2.2.			
	Total			3/4
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5/2.9	1/1
	2.3.10	2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.1/3.1	0/1
	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6/3.0	1/1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5/3.1	1/1
	2.3.			
	2.3.			
	Total			3/4
Emergency Procedures/ Plan	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3/4.0	1/1
	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	2.9/3.6	1/1
	2.4.14	Knowledge of crew roles and responsibilities during EOP flowchart use.	3.3/3.9	1/1
	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	3.4/3.9	1/1
	2.4.39	Knowledge of the RO's responsibilities in emergency plan implementation.	3.3/3.1	1/1
	2.4.			5/5
	Total			
Tier 3 Point Total (RO/SRO)				13/17

Facility: Surry Date of Exam: 3/02 Exam Level: RO

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

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

Note:
1. Ensure that at least two topics from every K/A category are sampled within each tier (i.e., the "Tier Totals" in each K/A category shall not be less than two).
2. The point total for each group and tier in the proposed outline must match that specified in the table. The final point total for each group and tier may deviate by ±1 from that specified in the table based on NRC revisions. The final exam must total 100 points.
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.

Emergency and Abnormal Plant Evolutions - Tier 1/Group 1

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000005 Inoperable/Stuck Control Rod / 1	X						AK1.02 Flux tilt	3.1/3.9	1
000015/17 RCP Malfunctions / 4		X					AK2.10 RCP indicators and controls	2.8/2.8	1
BW/E09; CE/A13; W/E09&E10 Natural Circ. / 4						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0/4.3	1
000024 Emergency Boration / 1	X						AK1.04 Low temperature limits for boron concentration	2.8/3.6	1
000026 Loss of Component Cooling Water / 8									
000027 Pressurizer Pressure Control System Malfunction / 3			X				AK3.01 Isolation of PZR spray following loss of PZR heaters.	3.5/3.8	1
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4		X					AK2.02 Sensors and detectors	2.6/2.6	1
CE/A11; W/E08 RCS Overcooling - PTS / 4			X				EK3.1 Facility operating characteristics during transient conditions, including coolant chemistry and the effects of temperature, pressure, and reactivity changes and operating limitations and reasons for these operating characteristics. (RO only)	3.4/3.9	1
000051 Loss of Condenser Vacuum / 4			X				AK3.01 Loss of steam dump capability upon loss of condenser vacuum	2.8/3.1	1
000055 Station Blackout / 6			X				EK3.02 Actions contained in EOP for loss of offsite and onsite power	4.3/4.6	1
000057 Loss of Vital AC Elec. Inst. Bus / 6				X			A1.06 Manual control of components for which automatic control is lost	4.0/4.3	1
000062 Loss of Nuclear Service Water / 4				X			AA1.05 The CCWS surge tank, including level control and level alarms and radiation alarm	3.1/3.1	1
000067 Plant Fire On-site / 9	X						AK1.02 Fire fighting	3.1/3.2	1
000068 (BW/A06) Control Room Evac. / 8		X					AK2.03 Controllers and positioners	2.9/3.1	1
000069 (W/E14) Loss of CTMT Integrity / 5					X		AA2.01 Loss of containment integrity (RO only)	3.7/4.3	1
000074 (W/E06&E07) Inad. Core Cooling / 4					X		EA2.01 Subcooling margin (RO only)	4.6/4.9	1
BW/E03 Inadequate Subcooling Margin / 4							N/A		
000076 High Reactor Coolant Activity / 9				X			AA1.04 Failed fuel-monitoring equipment	3.2/3.4	1
BW/A02&A03 Loss of NNI-X/Y / 7							N/A		
K/A Category Totals:	3	3	4	3	2	1	Group Point Total:		16

Emergency and Abnormal Plant Evolutions - Tier 1/Group 2

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000001 Continuous Rod Withdrawal / 1				X			AA1.06 Rod transfer switches	3.0/2.9	1
000003 Dropped Control Rod / 1		X					AK2.05 Control rod drive power supplies and logic circuits	2.5/2.8	1
000007 (BW/E02&E10; CE/E02) Reactor Trip - Stabilization - Recovery / 1						X	2.4.47 Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.4/3.7	1
BW/A01 Plant Runback / 1							N/A		
BW/A04 Turbine Trip / 4							N/A		
000008 Pressurizer Vapor Space Accident / 3									
000009 Small Break LOCA / 3									
000011 Large Break LOCA / 3			X				EK3.03 Starting auxiliary feed pumps and flow, ED/G, and service water pumps	4.1/4.3	1
W/E04 LOCA Outside Containment / 3						X	2.4.9 Knowledge of low power / shutdown implications in accident (e.g. LOCA or loss of RHR) mitigation strategies. (RO only)	3.3/3.9	1
BW/E08; W/E03 LOCA Cooldown/Depress. / 4						X	2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures. (RO only)	4.0/4.3	1
W/E11 Loss of Emergency Coolant Recirc. / 4				X			EA1.1 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	3.9/4.0	1
W/EO1 & E02 Rediagnosis & SI Termination / 3						X	2.4.5 Knowledge of the organization of the operating procedures network for normal, abnormal and emergency evolutions. (R0 only)	2.9/3.6	1
000022 Loss of Reactor Coolant Makeup / 2									
000025 Loss of RHR System / 4	X						AK1.01 Loss of RHRS during all modes of operation.	3.9/4.3	1
000029 Anticipated Transient w/o Scram / 1						X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (RO only)	4.0/4.0	1
000032 Loss of Source Range NI / 7		X					AK2.01 Power supplies, including proper switch positions	2.7/3.1	1
000033 Loss of Intermediate Range NI / 7									
000037 Steam Generator Tube Leak / 3									
000038 Steam Generator Tube Rupture / 3			X				EK3.02 Prevention of secondary PORV cycling.	4.4/4.5	1
000054 (CE/E06) Loss of Main Feedwater / 4				X			AA1.02 Manual startup of electric and steam-driven AFW pumps.	4.4/4.4	1
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4		X					EK2.01 Components, and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features. (RO only)	3.7/3.9	1
000058 Loss of DC Power / 6									
000059 Accidental Liquid RadWaste Rel. / 9			X				AK3.03 Declaration that a radioactive-liquid monitor is inoperable	3.0/3.7	1

000060 Accidental Gaseous Radwaste Rel. / 9		X					AK2.02 Auxiliary building ventilation system	2.7/3.1	1
000061 ARM System Alarms / 7									
W/E16 High Containment Radiation / 9	X						EK1.3 Annunciators and conditions indicating signals, and remedial actions associated with the (High Containment Radiation).	3.0/3.3	1
CE/E09 Functional Recovery							N/A		
K/A Category Point Totals:	2	4	3	3	0	5	Group Point Total:		17

ES-401 PWR RO Examination Outline Form ES-401-4 (R8, S1)

Emergency and Abnormal Plant Evolutions - Tier 1/Group 3

E/APE # / Name / Safety Function	K1	K2	K3	A1	A2	G	K/A Topic(s)	Imp.	Points
000028 Pressurizer Level Malfunction / 2		X					AK2.03 Controllers and positioners	2.6/2.9	1
000036 (BW/A08) Fuel Handling Accident / 8									
000056 Loss of Off-site Power / 6			X				AK3.01 Order and time to initiation of power for the load sequencer	3.5/3.9	1
000065 Loss of Instrument Air / 8									
BW/E13&E14 EOP Rules and Enclosures									
BW/A05 Emergency Diesel Actuation / 6									
BW/A07 Flooding / 8									
CE/A16 Excess RCS Leakage / 2									
W/E13 Steam Generator Over-pressure / 4						X	2.4.15 Knowledge of communications procedures associated with EOP implementation.(CFR: 41.10 / 45.13)	3.0/3.5	1
W/E15 Containment Flooding / 5									
K/A Category Point Totals:	0	1	1	0	0	1	Group Point Total:		3

ES-401 PWR RO Examination Outline Form ES-401-4 (R8, S1)

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			X				X					K3.01 CVCS A1.01 T-ave. and no-load T-ave(RO only)	2.9/3.0 3.8/4.2	2
003 Reactor Coolant Pump				X					X			K4.07 Minimizing RCS leakage (mechanical seals) (RO Only) A3.02 Motor current	3.2/3.4 2.6/2.5	2
004 Chemical and Volume Control		X				X						K2.04 BWST tank heaters K6.17 Flow paths for emergency boration (RO Only)	2.6/2.7 4.4/4.6	2
013 Engineered Safety Features Actuation					X						X	K5.02 Safety system logic and reliability (RO Only) 2.4.4 Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	2.9/3.3 4.0/4.3	2
015 Nuclear Instrumentation				X					X			K4.08 Automatic rod motion on demand signals A3.03 Verification of proper functioning/operability (RO Only)	3.4/3.7 3.9/3.9	2
017 In-core Temperature Monitor	X								X			K1.01 Plant computer A3.01 Indications of normal, natural and interrupted circulation of RCS	3.2/3.2 3.6/3.8	2
022 Containment Cooling				X						X		K4.05 Containment cooling after LOCA destroys ventilation ducts A4.05 Containment readings of temperature, pressure, and humidity system (RO Only)	2.6/2.7 3.8/3.8	2
025 Ice Condenser												N/A		
056 Condensate											X	2.1.32 Ability to explain and apply all system limits and precautions.	3.4/3.8	1
059 Main Feedwater			X								X	K3.03 S/G's (RO Only) 2.4.31 Knowledge of annunciators alarms and indications, and use of the response instructions.	3.5/3.7 3.3/3.4	2
061 Auxiliary/Emergency Feedwater		X										K2.02 AFW electric drive pumps	3.7/3.7	1
068 Liquid Radwaste						X						K6.10 Radiation Monitors	2.5/2.9	1
071 Waste Gas Disposal								X		X		A2.02 Use of waste gas release monitors, radiation, gas flow rate, and totalizer (RO Only) A4.07 Waste gas release flow meter	3.3/3.6 3.0/3.0	2
072 Area Radiation Monitoring					X			X				K5.02 Radiation intensity changes with source distance A2.02 Detector failure	2.5/3.2 2.8/2.9	2
K/A Category Point Totals:	1	2	2	3	2	2	1	2	3	2	3	Group Point Total:		23

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
002 Reactor Coolant						X						K6.03 Reactor vessel level indication	3.1/3.6	1
006 Emergency Core Cooling					X							K5.10 Theory of thermal stress	2.5/2.9	1
010 Pressurizer Pressure Control								X				A2.03 PORV failures (RO only)	4.1/4.2	1
011 Pressurizer Level Control			X									K3.02 RCS	3.5/3.7	1
012 Reactor Protection				X								K4.06 Automatic or manual enable/disable of RPS trips (RO only)	3.2/3.5	1
014 Rod Position Indication			X									K3.02 Plant Computer	2.5/2.8	1
016 Non-nuclear Instrumentation				X								K4.03 Input to control systems (RO Only)	2.8/2.9	1
026 Containment Spray							X					A1.01 Containment pressure	3.9/4.2	1
029 Containment Purge									X			A3.01 CPS isolation	3.8/4.0	1
033 Spent Fuel Pool Cooling	X											K1.05 RWST	2.7/2.8	1
035 Steam Generator							X					A1.01 S/G wide and narrow range level during startup, shutdown, and normal operations	3.6/3.8	1
039 Main and Reheat Steam										X		A4.04 Emergency feedwater pump turbines	3.8/3.9	1
055 Condenser Air Removal											X	2.1.28 Knowledge of the purpose and function of major system components and controls. (CFR: 41.7)	3.2/3.3	1
062 AC Electrical Distribution	X											K1.02 ED/G (RO only)	4.1/4.4	1
063 DC Electrical Distribution									X	X		A2.01 Grounds A4.02 Battery voltage indicator	2.5/3.2 2.8/2.9	2
064 Emergency Diesel Generator								X				A2.06 Operating unloaded, lightly loaded, and highly loaded time limit	2.9/3.3	1
073 Process Radiation Monitoring											X	2.1.32 Ability to explain and apply all system limits and precautions. (CFR: 41.10 / 43.2 / 45.12)	3.4/3.8	1
075 Circulating Water		X										K2.03 Emergency/essential SWS pumps	2.6/2.7	1
079 Station Air											X	2.4.49 Ability to perform without reference to procedures those actions that require immediate operation of system components and controls. (CFR: 41.10 / 43.2 / 45.6)	4.0/4.0	1
086 Fire Protection														

K/A Category Point Totals:	2	1	2	2	1	1	2	2	2	2	3	Group Point Total:

System # / Name	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	G	K/A Topic(s)	Imp.	Points
005 Residual Heat Removal						X						K6.03 RHR Hx (RO only)	2.5/2.6	1
007 Pressurizer Relief/Quench Tank								X				A2.02 Abnormal pressure in the PRT(RO Only)	2.6/3.2	1
008 Component Cooling Wate							X					A1.04 Surge tank level (RO only)	3.1/3.2	1
027 Containment Iodine Removal												No K/A's		0
028 Hydrogen Recombiner and Purge Control												No K/A's		0
034 Fuel Handling Equipment											X	2.1.27 Knowledge of system purpose and or function.	2.8/2.9	1
041 Steam Dump/Turbine Bypass Control					X							K5.02 Use of steam tables for saturation temperature and pressure	2.5/2.8	1
045 Main Turbine Generator									X			A3.11 Generator trip	2.6/2.9	1
076 Service Water			X									K3.01 Closed cooling water (RO Only)	3.4/3.6	1
078 Instrument Air														0
103 Containment										X		A4.09 Containment Vacuum System (RO only)	3.1/3.7	1
K/A Category Point Totals:	0	0	1	0	1	1	1	1	1	1	1	Group Point Total:		8

Plant-Specific Priorities

System / Topic	Recommended Replacement for...	Reason	Points

Plant-Specific Priority Total: (limit 10)	

Facility: Surry	Date of Exam: 3/02		Exam Level: RO/SRO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.1	Knowledge of conduct of operations requirements.	3.7/3.8	1/1
	2.1.4	Knowledge of shift staffing requirements.	2.3/3.4	0/1
	2.1.12	Ability to apply technical specifications for a system.	2.9/4.0	1/1
	2.1.34	Ability to maintain primary and secondary plant chemistry within allowable limits.	2.3/2.9	0/1
	2.1.			
	2.1.			
	Total			2/4
Equipment Control	2.2.6	Knowledge of the process for making changes in procedures as described in the safety analysis report.	2.3/3.3	0/1
	2.2.13	Knowledge of tagging and clearance procedures.	3.6/3.8	1/1
	2.2.30	Knowledge of RO duties in the control room during fuel handling such as alarms from fuel handling area, communication with fuel storage facility, systems operated from the control room in support of fueling operations, and supporting instrumentation.	3.5/3.3	1/1
	2.2.12	Knowledge of surveillance procedures.	3.0/3.4	1/1
	2.2.			
	2.2.			
	Total			3/4
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5/2.9	1/1
	2.3.10	2.3.10 Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure.	2.1/3.1	0/1
	2.3.1	Knowledge of 10 CFR: 20 and related facility radiation control requirements.	2.6/3.0	1/1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5/3.1	1/1
	2.3.			
	2.3.			
	Total			3/4
Emergency Procedures/ Plan	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	3.3/4.0	1/1
	2.4.5	Knowledge of the organization of the operating procedures network for normal, abnormal, and emergency evolutions.	2.9/3.6	1/1
	2.4.14	Knowledge of crew roles and responsibilities during EOP flowchart use.	3.3/3.9	1/1
	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	3.4/3.9	1/1
	2.4.39	Knowledge of the RO's responsibilities in emergency plan implementation.	3.3/3.1	1/1
	2.4.			5/5
	Total			
Tier 3 Point Total (RO/SRO)				13/17

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

JPM – A.1

Ro

Determine Component Positions for Valve Line-ups and Tag Order Performance

APPLICANT _____

EXAMINER _____

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Determine Component Positions for valve verifications for valve lineups

Alternate Path:

N/A

Facility JPM #:

NEW

K/A Rating(s):

KA 2.2.13 ; (3.6/3.8) 2.1.1 (3.7/3.8) 2.1.29 (3.4/3.3)

Task Standard:

Preferred Evaluation Location:

Simulator _____ In-Plant _____ Mock-up _X_

Preferred Evaluation Method:

Perform __X__ Simulate _____

References:

SPP-10.3

Validation Time: 10 min. **Time Critical:** No

==========

Candidate: _____
NAME

Time Start : _____
Time Finish: _____

Performance Rating: SAT _____ UNSAT _____ Question Grade _____ Performance Time _____

Examiner: _____ _____/_____
NAME SIGNATURE DATE

==========

COMMENTS

Need to verify with site on exactly what to expect based on whether the applicant is first, second or independent verifier position.

Tools/Equipment/Procedures Needed:

0-SPP-10.2 and 10.3

READ TO OPERATOR

DIRECTION TO TRAINEE: (READ APPROPRIATE DIRECTION)

TASK TO BE PERFORMED IN SIMULATOR OR MOCK-UP:

I will explain the initial conditions, and state the task to be performed. All 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.

TASK TO BE SIMULATED IN MAIN CONTROL ROOM:

I will explain the initial conditions, and state the task to be performed. All in-plant steps, including any required communications, **shall be simulated** for this JPM. Under no circumstances are you to operate any plant equipment. 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 and INITIATING CUES:

You are an Operator, the Refrigeration unit in the maintenance shop is being lined up for service. The Unit supervisor has directed you to perform **Independent Verification** of manual valves per Attachment 1 and notify him when complete.

START TIME: _____

Independent Verification of Valve. STEP 1: May obtain a copy of the appropriate procedure. STANDARD: COMMENTS: (Not Critical).	___ SAT ___ UNSAT
STEP 2: Independent Verification of Valve, XXX (MOV) in the **CLOSED** position. STANDARD: Notes position of valve position indicator (Anything else ????) COMMENTS: Need site input.	**CRITICAL STEP** ___ SAT ___ UNSAT

STEP 3: Check valve XXX **LOCKED OPEN.**, (Rising stem gate valve) STANDARD: 1. Unlocks valve 2. Checks the manual valve open by: a. Moving valve in the closed direction until there is a small amount of stem movement and then moved in the open direction until the valve is fully open position. a. Valve position should be verified by, but is not limited to , one or more of the following: Visual position of the valve stem (e.g., grease markings, indicator on rising stem valves, or other mechanical position indication); Remote position indication; Observation of the expected system response in regard to valve position (e.g., indication of flow downstream of valve, indication that the section of piping downstream is pressurized) a. Locking the valve so valve operator travel is limited as much as possible. a. Verifying the locking mechanism is properly restored and secured. a. Having a second qualified individual Independently Verify that the lock is installed on the correct valve and properly locked. COMMENTS: After performing steps 2a. through 2d., have applicant perform step 2e. as an Independent verifier.	___ SAT ___ UNSAT
STEP 4: Independent Verification of valve, XXX (Grinell valve) **Locked CLOSED.** STANDARD: 1. Unlocks valve 2. Checks the manual valve open by: a) Moving valve in the closed using normal closing torque. b) Valve position should be verified by, but is not limited to, one or more of the following: Visual position of the valve stem (e.g., grease markings, indicator on rising stem valves, or other mechanical position indication); Remote position indication; Observation of the expected system response in regard to valve position (e.g., indication of flow downstream of valve, indication that the section of piping downstream is pressurized) c) Locking the valve so valve operator travel is limited as much as possible. d) Verifying the locking mechanism is properly restored and secured. e) Having a second qualified individual Independently Verify that the lock is installed on the correct valve and properly locked. COMMENTS:	___ SAT ___ UNSAT

	CRITICAL STEP
STEP 7: Independent Verification of valve, XXX (Rising Handwheel globe), **Locked THROTTLED 3 TURNS OPEN** STANDARD: a) Unlock locking device b) Manipulate the valve in the closed direction while counting the number of turns required to fully close the valve. c) The amount of valve slack must be determined. d) After closure and determination of valve slack, reopen the valve 3 turns. ***e)*** Simultaneous Verification is performed by observing that the valve is manipulated the proper number of turns. ***(Examiner will act as simultaneous verifier)*** f) Install locking device g) Verify locking device COMMENTS: After performing steps a. through f., have applicant perform step g. as an Independent verifier. Part of this standard came from VPAP-1405, section 6.5.1.d and part from OPAP-0012, section 6.8.5. Need to verify if the above standard is correct.	___ SAT ___ UNSAT

TIME STOP: _____

NOTE: Three out of four of the Valve manipulations must be performed correct to satisfactorily complete this JPM.

	CRITICAL STEP
STEP 7: Independent Verification of valve, XXX (AOV), **IN FAILED POSITION.** STANDARD: COMMENTS: Need site input. Want to see applicant fail air to the AOV, verify it goes to failed position (ie. No binding or jacking device interference).	___ SAT ___ UNSAT

TIME STOP: _____

K/A Rating:

K/A : 2.2.13 ; (3.6/3.8) 2.1.1 (3.7/3.8) 2.1.29 (3.4/3.3)

References:

VPAP-1405
OPAP-0012

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

INITIAL CONDITIONS and INITIATING CUES:

You are an Operator. The Unit supervisor has directed you to perform **Independent Verification** of manual valves per Attachment 1 and notify him when complete.

ATTACHMENT 1
REFRIGERTION UNIT MANUAL VLVE VERIFICATION CHECKLIST.

Valve ID Number	Noun Name	Required Position	1st	2nd	IV
MOV		CLOSED			X
GATE VALVE (RISING STEM)		LOCKED OPEN	X		
GRINELL		LOCKED CLOSED	X		
GLOBE VAVLE (RISING HANDWHEEL)		LOCKED THROTTLED 3 TURNS OPEN	X		
AOV		FAILED(OPEN/ CLOSED ???)	X		

U. S. Nuclear Regulatory Commission

Region II

A.1.2 Administrative Section

NRC-ADMIN-JPM-06

Title:

DETERMINATION OF VCT LEAKRATE

JPM TITLE: DETERMINATION OF VCT LEAKRATE

JPM NUMBER: NRC-ADMIN-JPM-06

JPM REV. DATE: 03/06/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Determine VCT leakrate based on recorder trace

REQUIRED MATERIALS:

1. 1-OPT-RC-10.01, REACTOR COOLANT LEAKAGE - MANUALLY CALCULATED
2. Calculator

REFERENCES:

1. 1-OPT-RC-10.01, REACTOR COOLANT LEAKAGE - MANUALLY CALCULATED
2. 1-DRP-003, CURVE BOOK

VALIDATION TIME: 30 Minutes.

K/A: GEN 2.4.47 (3.4/3.7)

TERMINATING CUES:

The Trainee states that the calculation of VCT leakrate is complete.

SET-UP:

1. None Required

READ TO THE TRAINEE

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. I am the Unit 1 SRO and you are the Third License.

INITIATING CUES:

During a walkdown of the Control Board, the Unit 1 RO noted a change in the VCT level trend as indicated on the Trend Recorder. All other Unit parameters are stable and normal for 100% power operation.

Here is copy of the VCT level trace from the Trend Recorder (Attachment 1). The left-hand trace is VCT level and the right-hand trace is Intake Canal level. The recorder was set-up to record VCT level over a range of 0% to 100% and set at a chart speed of 1 inch per hour.

Here is a copy of 1-OPT-RC-10.01. I need you to calculate the RCS leakrate based on the change in VCT level, as indicated on this recorder trace. Only those portions of the procedure that specifically address the change in VCT level need to be completed. When you have completed your determination of the leakrate, please inform me of the value in gallons per minute.

Step 1: Calculate the percent change in VCT level.

STANDARDS

a. The Operator examines the recorder trace and calculates that the level is decreasing from 34% to 27% over a 15 minute period.

EVALUATOR'S CUES:

- If asked, there has been no change in any other parameter except for VCT level.
- If asked, assume normal 100% power values for all variables.

Step 2: Convert the percent change in VCT level over time to lbm/minute.

STANDARDS:

___ a. Multiplies the percent change in VCT level by the conversion factor listed on Attachment 4.
- 7% x 116.6 lbm/% = 816.2 lbm

___ b. Divides the calculated value by the elapsed time for the change.
- 816.2 lbm / 60 minutes = 13.60 lbm/min

Step 3: Converts the leakrate to gpm by multiplying by the conversion factor listed in Table 5 of Attachment 4.

STANDARDS:

___ a. Identifies the appropriate conversion factor in Table 5 of Attachment 4.

___ b. Multiplies the lbm/min by the conversion factor to obtain gpm
- $\frac{7.48052 \text{ gal/ft3}}{61.856 \text{ lbm/ft3}}$ x 13.60 lbm/min = 1.645 gpm

Step 4: Informs the Unit SRO of the calculated leakrate

STANDARDS:

___ a. Informs the Unit SRO that the calculated RCS leakrate based on the change in VCT level is 1.645 gpm.

EVALUATOR'S NOTES:

- Accept 1.81 gpm to 1.48 gpm as correct based on an acceptable tolerance for reading the recorder trace of ± 10%.

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.

2. I am the Unit 1 SRO and you are the Third License.

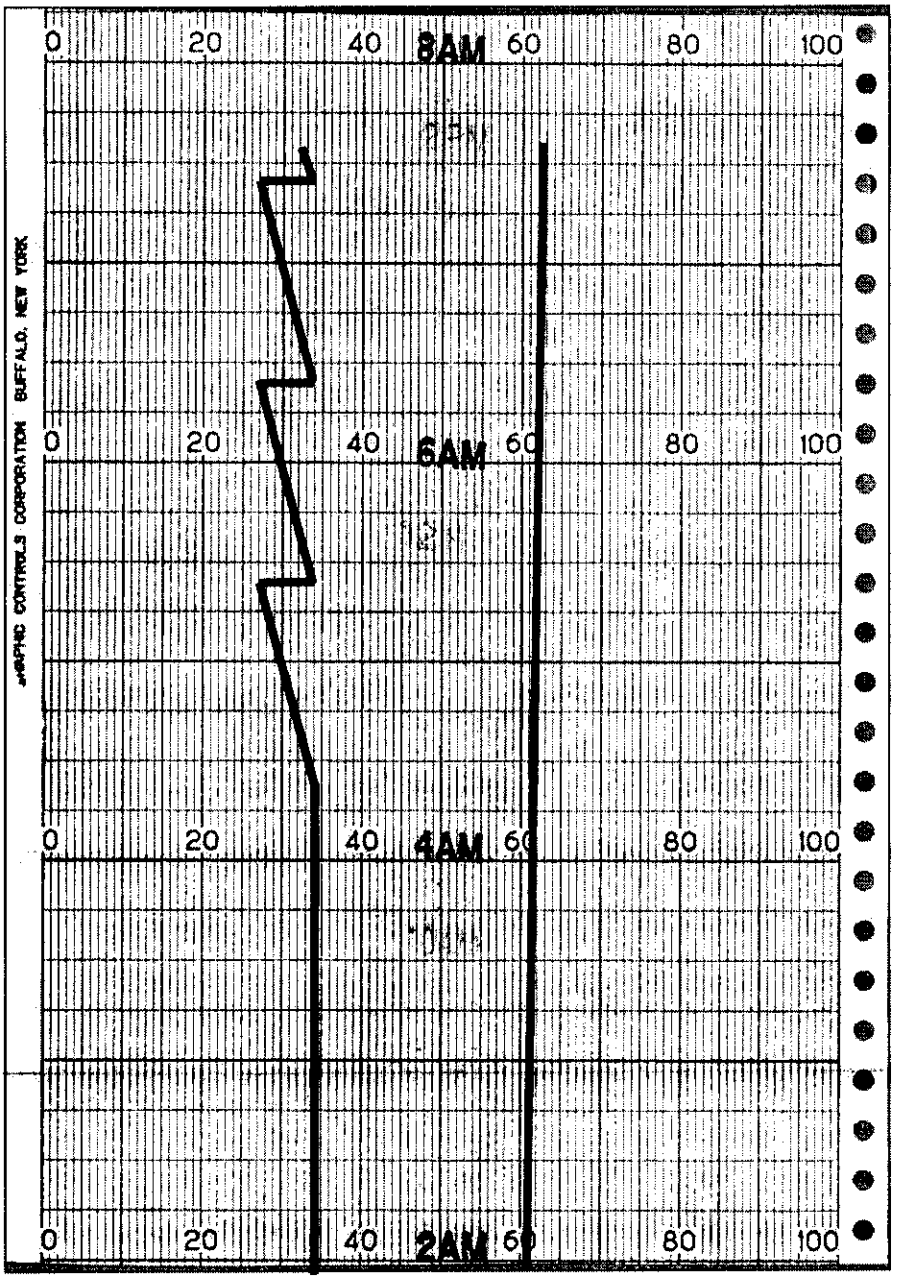
INITIATING CUES:

During a walkdown of the Control Board, the Unit 1 RO noted a change in the VCT level trend as indicated on the Trend Recorder. All other Unit parameters are stable and normal for 100% power operation.

Here is copy of the VCT level trace from the Trend Recorder (Attachment 1). The left-hand trace is VCT level and the right-hand trace is Intake Canal level. The recorder was set-up to record VCT level over a range of 0% to 100% and set at a chart speed of 1 inch per hour.

Here is a copy of 1-OPT-RC-10.01. I need you to calculate the RCS leakrate based on the change in VCT level, as indicated on this recorder trace. Only those portions of the procedure that specifically address the change in VCT level need to be completed. When you have completed your determination of the leakrate, please inform me of the value in gallons per minute.

Attachment 1



Developed for the Surry, March 2002, Initial Examination
Examination Report Number 2002-301

U.S. NUCLEAR REGULATORY COMMISSION

REGION II

ADMINISTRATION

NRC-ADMIN-A.2-RO

CLASS ROOM/CONTROL ROOM

TITLE:

TAGGING ELEMENTS/BOUNDARY DETERMINATION

APPLICANT: _____

_____

EXAMINER:

REV. 0

REGION II
INITIAL LICENSE EXAMINATION
JOB PERFORMANCE MEASURE

Task:

Determine Tagging Elements/Boundary Determination

Alternate Path:

NO

Facility JPM #:

NEW

K/A Ratings:

G 2.1.24 (2.8/3.1) Ability to obtain and interpret station electrical and mechanical drawings.
G 2.2.13 (3.6/3.8) Knowledge of tagging and clearance procedures.

Task Standard:

Preferred Evaluation Location: Preferred Evaluation Method:

Simulator _____ In-plant _____ Perform _____ Simulate ____

References:
USFAR, Section 10.3.5, Condensate and Feedwater, TRM, 3.7, Plant Systems, 11448-FM-068A, Feed water system.
Validation Time: Critical Time: NO

Applicant: _____ Start _____
Name Finish: _____

Performance Rating: SAT _____ UNSAT _____ Performance Time _____

Examiner: _____
Name

COMMENTS

READ TO THE OPERATOR

DIRECTION TO THE APPLICANT:

TASK TO BE PERFORMED ANYWHERE

I will explain the initial conditions and state the task to be performed. I will provide any initiating cues and reports on other actions when directred by you. Ensure you indicate to me when you understand your assigned task. To indicate you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the third license. 1-FW-P-4A, "AFW Booster Pump," requires a seal package replacement. This will require the pump casing to be drained.

INITIATING CUES:

You are requested to determine ALL requirements/elements necessary to prepare this system for the required maintenance (Tag out elements, valve positions, etc/Boundaries). Use the attached table to identify all components.

NOTE: (RESTRICT MIND access to plant drawings and administrative procedures. MOP'S are NOT authorized.)

NOTE: The order in which tags should be placed is not necessary.

NOTE: The number of blanks on the attached table is not indicative of the number of item necessary to complete the JPM

ANSWER KEY

	COMPONENT ID NUMBER/ NAME	POSITION	DANGER TAG REQUIREMENT (YES/NO)
1	1-EP-BKR-1H1-2N10C, AFW Booster Pump 1-FW-P-4A	OPEN	YES (Critical Step)
2	1-FW-279 AFW Booster Pump 4 A discharge	CLOSE	YES (Critical Step)
3	1-FW-293 AFW Pump 4 A Recirc Valve	CLOSE	YES (Critical Step)
4	1-FW-277 AFW Booster Pump 4 A Suction.	CLOSE	YES (Critical Step)
5	1-FW-296	Pipe Cap Removed	NO (Critical Step)
6	Attach Drain Hose to 1-FW -296 And Run to Floor Drain.	NA	NA
7	1-FW-296	OPEN	YES (Only Part That Is Critical, Is to Have it Opened)
8	1-FW-307 AFW Booster Pump Disch PI-160A isolation.	Open	Yes (Critical Step)
9	1-FW-600, AFW Booster Pump Disch PI-160A	Pipe Cap Removed	NO (Critical Step)
10	Attach Drain Hose to 1-FW-600 and Run to Floor Drain	NA	NA
11	1-FW-600	OPEN	YES (Only Part That Is Critical, Is to Have it Opened)

A

	COMPONENT ID NUMBER/ NAME	POSITION	DANGER TAG REQUIREMENT (YES/NO)
1	N		
2			
3			
4			
5	S		
6			
7			
8	W		
9			
10			
11			
12	E		
13			
14			
15	R		
16			
17		K	
18			
19			
20			E
21			

Y

22			
23			

APPLICANT CUE SHEET

(TO BE RETURNED TO THE EXAMINER UPON COMPLETION OF TASK)

I will explain the initial conditions and state the task to be performed. I will provide any initiating cues and reports on other actions when directred by you. Ensure you indicate to me when you understand your assigned task. To indicate you have completed your assigned task, return the handout sheet I provided you.

INITIAL CONDITIONS:

I am the Shift Supervisor and you are the third license. 1-FW-P-4A, "AFW Booster Pump," requires a seal package replacement. This will require the pump casing to be drained.

INITIATING CUES:

You are requested to determine ALL requirements/elements necessary to prepare this system for maintenance (Tag out elements, valve positions, etc/Boundaries). Use the attached table to identify all components.

NOTE: (RESTRICT MIND access to plant drawings and administrative procedures. MOP'S are NOT authorized.)

NOTE: The order in which tags should be placed is not necessary.

NOTE: The number of blanks on the attached table is not indicative of the number of item necessary to complete the JPM

NEW NRC JPM

A.3
2

Operator _____ Evaluator _____

Observer _____ Evaluation Date _____

Task

Determine Steam Generator Primary to Secondary Leakage Rate using 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring.

Applicability	**Est Completion Time**	**Actual Time**
RO ONLY	15 Minutes	_____

NUREG-1122 Importance Ratings
GEN2.3.11 (RO 2.7/SRO 3.2)

Conditions

- Task is to be PERFORMED in area which has adequate reference material.

Standards

- Complete calculation of Primary to Secondary Leakage. Value XXX +/- 10% gpd

Initiating Cues

- Shift Supervisor Direction

Terminating Cues

- Completion of Attachment 1 of 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring.

Procedures

- 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring.

Tools and Equipment

- Calculator

Safety Considerations

- None

Performance Checklist

Directions to the Operator.

Primary to secondary leakage is suspected. The Shift Supervisor has directed you to perform attachment 1 of 0-OSP-RC-002, Steam Generator Primary to Secondary Leakage Monitoring. The most recent Unit 1 RCS isotopic activities are attached. Calculate the Primary to Secondary leakage rate and report gallon-per-day leakage rate to the Shift Supervisor.

Notes to the Evaluator.

-
- **START TIME:** _____

---

1. Record the current time and date. _____ / _____

   Standards
   Records current time and date

   Evaluator's Comments

   _____

2. Obtain flow rates from both Air Ejectors and record total flow rate below:

   - Air Ejector A flow _____ scfm +
   - Air Ejector B flow _____ scfm =
   - Total Flow _____ scfm

   Standards
   Obtains readings from (TBD)

   Evaluator's Comments

   _____

3. Record the current reading from 1-SV-RI-111. _____ cpm

   Standards
   Obtains readings from (TBD)

   Evaluator's Comments

4. Obtain the most recent Unit 1 RCS activity for the isotopes listed in the table below from Chemistry and record in the Table. (This data is normally kept in the Radiation Monitor setpoint book and is updated weekly)

   Standards
   Uses provided attachment

   Evaluator's Comments

5. Multiply the isotopic concentrations (C) times the AE Rad Monitor Isotopic Efficiency (k)and record in the Table in column 4.

   Standards
   Completes column 4

   Evaluator's Comments

6. Add the products obtained in Step 5, column 4, and record below. This sum is R_c, Total AE RM response factor)
   R_c _____ (total AE RM response factor)

   Standards

   Calculates R_c
   Evaluator's Comments

7. Determine primary-to-secondary leak rate in gallons per day (Q L) IAW the following formula.
   •Q_L = 1.084E4 x (R - 90) x F AE / R c = _____ gpd

   Standards

   Calcualtes Q_L
   Evaluator's Comments

Developed for the Surry, 2002, Initial Examination

U. S. NUCLEAR REGULATORY COMMISSION

REGION II

A-4 ADMINISTRATIVE SECTION RO

NRC-ADMIN-JPM-04 (RO ONLY)

Title:

Meteorological and Stability Class Determination

IAW

EPIP-2.01 Notification of State and Local Governments

Read to the Operator

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed/simulated for this JPM. 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 was declared 35 minutes ago due to RCS leakage.

An Initial Report of Emergency to State and Local Governments was completed 25 minutes ago with an update schedule of 60 minutes.

A breach in the containment has caused a release of radioactive material that is presently occurring.

A follow-up message to the State and Local Governments is being prepared using Attachment 2 of EPIP-2.01.

The Backup MET Tower recorders are out of service due to supply breaker (VB II-IV breaker 33) replacement. Backup MET tower input to the ERFCS remains operable.

INITIATING CUES:

The Unit 1 SRO has requested that you assist the State and Local Emergency Communicator by performing steps 19-25 of EPIP 2.01, "Notification of State and Local Governments," to obtain Meteorological Data from the Met Panel.

* - indicates a critical step.

Meteorological and Stability Class Determination	
STEP 1: Observes Step 19. STANDARD: _____ Observes NOTE identifying sources to obtain data (Charts, EMCOMM, AP-10.13). _____ Observes NOTE stating EMCOMM and ERFCS Group Review #39 contain MET data. _____ Identifies On-Site Meteorological Information is available. COMMENTS:	_____SAT _____UNSAT
STEP 2: GET METEOROLOGICAL INFORMATION: (Step 20) STANDARD: _____ Determines Temperature, Wind Speed, Wind Direction, Affected Sectors, and Stability class are needed COMMENTS:	_____SAT _____UNSAT
STEP 3: Determines temperature. (Step 21) STANDARD: *_____On the MET panel locates and observes the Main Tower temperature (23°C/73°F). _____ Multiplies 23°C by 1.8 and adds 32 to obtain 73°F (if needed) **Evaluator's Cue: * Provide indication that digital readout is 23°C. * If candidate uses ERFCS, data point M3MM001C indicates (highlighted in**	_____SAT _____UNSAT

* - indicates a critical step.

Meteorological and Stability Class Determination	
yellow) COMMENTS:	

* - indicates a critical step.

STEP 4: Observes NOTE prior to step 22. STANDARD: _____ Observes NOTE identifying source of wind indication is Main tower lower. Alternate indication is (1) Backup tower (2) Main tower Upper. COMMENTS:	_____SAT _____UNSAT
STEP 5: Gets Wind Speed (Step 22) STANDARD: _____ Determines the Main Tower Lower Level Wind Speed recorder is invalid and uses an alternate: *_____ Obtains wind speed (12 mph) from the Main Tower upper level recorder. **Evaluator's Cue:** **Provide indications that the Main Tower Lower recorder indicates EEEEEE.** **Provide indications that the Backup Tower Wind Speed recorder is blank (powered off).** **Provide indications that the Main Tower Upper wind speed is 12 mph.** *** If candidate uses ERFCS, data points M3MM001C (Main Lower) and M3MM007C (B/U) indicate (highlighted in yellow)** COMMENTS:	_____SAT ____UNSAT

* - indicates a critical step.

STEP 6: Observes NOTES prior to step 23 STANDARD: _____ The approximate wind direction for the previous 15 minutes should be determined. ____ The primary source of wind direction is the Main Tower Lower. Alternate indications are: (1) Backup tower, (2) Main Tower Upper. ____ Wind direction is always given as the direction the wind blows from. COMMENTS:	_____SAT _____UNSAT
STEP 7: Gets Wind direction in terms of compass point wind blowing from. STANDARD: *_____Determines the Main Tower Lower Level Wind Direction recorder indicates 288 degrees (+/-4) for the last 15 minutes *_____Selects WNW as direction wind is blowing from. **Evaluator's Cue:** **Provide wind bouncing between 284 and 292 on the Main Tower Lower recorder.** **If candidate looks at ERFCS point M3MM004C provide cue of 288 degrees.** **If candidate looks at the upper recorder indications are bouncing between 305 and 310.** **Backup wind direction recorder is blank (no power).** **Other ERFCS wind direction points (M3MM005C**	_____SAT _____UNSAT

* - indicates a critical step.

and M3MM003C) indicate 306. COMMENTS:	
STEP 8: Observes NOTE prior to step 24. STANDARD: _____ Affected sectors are recorded using alphabetic designations. COMMENTS:	_____SAT _____UNSAT
STEP 9: Determine Downwind Sectors: (Step 24) STANDARD: *_____ Uses table in step 24 to determine E-F-G as the downwind sectors. COMMENTS:	_____SAT _____UNSAT

* - indicates a critical step.

STEP 10: Observes Notes Prior to step 25. STANDARD: _____ Main tower Delta T is preferred source of stability, sigma theta is secondary. _____ The value closer to "G" should be used if unable to distinguish Delta T or sigma theta. _____ Numerical ranges presented on the chart for Delta T and Sigma Theta are less than the range of the chart recorder and indicator in the Control Room. Indications are not expected to read outside the ranges found on these tables. COMMENTS:	_____SAT _____UNSAT
STEP 11: Determines Stability Class: (Step 25) STANDARD: _____ Identifies Main Tower Delta T recorder and Backup recorder are OOS *_____Identifies sigma theta ERFCS point indicates 10.2 degrees *_____Identifies stability class is "D" **Evaluator's Cue:** **Main Tower Delta T recorder has - - - - - - - indication.** **Sigma Theta recorder is blank (no power).** **Delta T ERFCS point M3MM008C is 9.99 bd (highlighted in yellow)**	_____SAT _____UNSAT

* - indicates a critical step.

Sigma Theta ERFCS point M3MM006C is 10.2 degrees. COMMENTS:	
STEP 12: Give Meteorological information to the requestor. STANDARD: _____ Provides Temperature, wind speed, Affected sectors, and stability class to the evaluator. COMMENTS: **END OF TASK**	_____SAT _____UNSAT

* - indicates a critical step.

Read to the Operator

DIRECTION TO APPLICANT:

I will explain the initial conditions, and state the task to be performed. All steps shall be performed/simulated for this JPM. 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 was declared 35 minutes ago due to RCS leakage.

An Initial Report of Emergency to State and Local Governments was completed 25 minutes ago with an update schedule of 60 minutes.

A breach in the containment has caused a release of radioactive material that is presently occurring.

A follow-up message to the State and Local Governments is being prepared using Attachment 2 of EPIP-2.01.

The Backup MET Tower recorders are out of service due to supply breaker (VB II-IV breaker 33) replacement. Backup MET tower input to the ERFCS remains operable.

INITIATING CUES:

The Unit 1 SRO has requested that you assist the State and Local Emergency Communicator by performing steps 19-25 of EPIP 2.01, "Notification of State and Local Governments," to obtain Meteorological Data from the Met Panel.

* - indicates a critical step.

Developed for the Surry, March 2002, Initial Examination

U. S. Nuclear Regulatory Commission

Region II

A-1 Administrative Section (SRO ONLY)

Title:

Valve Out of Position Actions

JPM TITLE: Valve Out of Position Actions

JPM NUMBER: NRC-ADMIN-JPM-A1 (SRO)

JPM REV. DATE: 03/07/+02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM: X SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Perform Follow-On tasks of OSP-ZZ-005, and identify applicable TS clock.

REQUIRED MATERIALS:

1. Marked up 1-OSP-ZZ-005, Operational Check of Engineered Safeguards Equipment
2. Tech Specs.

REFERENCES:

1. 1-OSP-ZZ-005, Operational Check of Engineered Safeguards Equipment
2. TS section 3.3, Safety Injection System.

VALIDATION TIME: 30 Minutes.

K/A: GEN2.1.33 4.0

TERMINATING CUES:

The candidate identifies the OSP acceptance criteria not met, applies TS 3.3 to identify the unit in a 72 hour clock.

READ TO THE TRAINEE

If you have any questions, ask them now and I will answer them. During the test, I cannot answer questions. When you complete all the steps correctly, you will pass this Job Performance Measure. I will describe the general conditions for the task you will perform and provide the initiating cues.

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. The Inside Service Building Operator has completed 1-OSP-ZZ-005 through section 6.
3. The Inside Service Building Operator had to leave for an emergent personal issue.

INITIATING CUES:

I need you to perform 1-OSP-ZZ-005, Follow-On actions

Step 1: Performs section 7.1.1, Follow-On

STANDARDS:

___ a. Evaluates Attachment 1 by reviewing the acceptance criteria.
*___ b. Determines 1-SI-48 is closed vs. required open.
___ c. Determines all other attachment 1 criteria is acceptable.

EVALUATOR'S NOTES:

Step 2: Determines Surveillance requirements are Unsatisfactory.

STANDARDS:

___ a. Marks unsatisfactory in step 7.1.2.

EVALUATOR'S NOTES:

Step 3: Performs Follow-On Tasks.

STANDARDS:

___ a. Documents unsat reults in Operator Comments (section 7.3)
___ b. Notifies the SS of the Unsat performance.
___ c. Initiates a PI. (DR).
___ d. Signs and dates the OSP.
___ e. Reports completion of the task.

EVALUATOR'S CUES:

- If asked: the Shift Supervisor (Henry Moore) acknowledges Unsat performance.
- If asked: PI is written and PI number is PI-02-9999.

PART B:

If an inoperability determination was NOT made during the JPM performance read the following statement;

You are now the SS, I need you to perform an operability determination based on the Unsatisfactory OPT performance.

Step 4: Reviews Tech Specs.

STANDARDS:

___ a. Reviews Tech Specs Section 3.3.A.3 and determines if the Spec applies.
___ b. Reviews Tech Specs Section 3.3.B.3 and determines if the Spec applies.
*___ c. Declares 1-SI-P-1B inoperable, starts a 72-hour Tech Spec clock.

EVALUATOR'S NOTES:

Step 5: Notifies SS.

STANDARDS:

___ a. Notifies the SS of the 72-Hour Clock.

EVALUATOR'S NOTES:

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.
2. The Inside Service Building Operator has completed 1-OSP-ZZ-005 through section 6.
3. The Inside Service Building Operator had to leave for an emergent personal issue.

INITIATING CUES:

I need you to perform 1-OSP-ZZ-005, Follow-On actions.

Developed for the Surry, March 2002, Initial Examination

U. S. Nuclear Regulatory Commission

Region II

A.1.2 Administrative Section

NRC-ADMIN-JPM-06

Title:

DETERMINATION OF VCT LEAKRATE

JPM TITLE: DETERMINATION OF VCT LEAKRATE

JPM NUMBER: NRC-ADMIN-JPM-06

JPM REV. DATE: 03/06/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Determine VCT leakrate based on recorder trace

REQUIRED MATERIALS:

1. 1-OPT-RC-10.01, REACTOR COOLANT LEAKAGE - MANUALLY CALCULATED
2. Calculator

REFERENCES:

1. 1-OPT-RC-10.01, REACTOR COOLANT LEAKAGE - MANUALLY CALCULATED
2. 1-DRP-003, CURVE BOOK

VALIDATION TIME: 30 Minutes.

K/A: GEN 2.4.47 (3.4/3.7)

TERMINATING CUES:

The Trainee states that the calculation of VCT leakrate is complete.

SET-UP:

1. None Required

READ TO THE TRAINEE

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.

2. I am the Unit 1 SRO and you are the Third License.

INITIATING CUES:

During a walkdown of the Control Board, the Unit 1 RO noted a change in the VCT level trend as indicated on the Trend Recorder. All other Unit parameters are stable and normal for 100% power operation.

Here is copy of the VCT level trace from the Trend Recorder (Attachment 1). The left-hand trace is VCT level and the right-hand trace is Intake Canal level. The recorder was set-up to record VCT level over a range of 0% to 100% and set at a chart speed of 1 inch per hour.

Here is a copy of 1-OPT-RC-10.01. I need you to calculate the RCS leakrate based on the change in VCT level, as indicated on this recorder trace. Only those portions of the procedure that specifically address the change in VCT level need to be completed. When you have completed your determination of the leakrate, please inform me of the value in gallons per minute.

Step 1: Calculate the percent change in VCT level.

STANDARDS

a. The Operator examines the recorder trace and calculates that the level is decreasing from 34% to 27% over a 15 minute period.

EVALUATOR'S CUES:

- If asked, there has been no change in any other parameter except for VCT level.
- If asked, assume normal 100% power values for all variables.

Step 2: Convert the percent change in VCT level over time to lbm/minute.

STANDARDS:

___ a. Multiplies the percent change in VCT level by the conversion factor listed on Attachment 4.
- 7% x 116.6 lbm/% = 816.2 lbm

___ b. Divides the calculated value by the elapsed time for the change.
- 816.2 lbm / 60 minutes = 13.60 lbm/min

Step 3: Converts the leakrate to gpm by multiplying by the conversion factor listed in Table 5 of Attachment 4.

STANDARDS:

___ a. Identifies the appropriate conversion factor in Table 5 of Attachment 4.

___ b. Multiplies the lbm/min by the conversion factor to obtain gpm
- $\frac{7.48052 \text{ gal/ft3}}{61.856 \text{ lbm/ft3}}$ x 13.60 lbm/min = 1.645 gpm

Step 4: Informs the Unit SRO of the calculated leakrate

STANDARDS:

___ a. Informs the Unit SRO that the calculated RCS leakrate based on the change in VCT level is 1.645 gpm.

EVALUATOR'S NOTES:

- Accept 1.81 gpm to 1.48 gpm as correct based on an acceptable tolerance for reading the recorder trace of ± 10%.

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.

2. I am the Unit 1 SRO and you are the Third License.

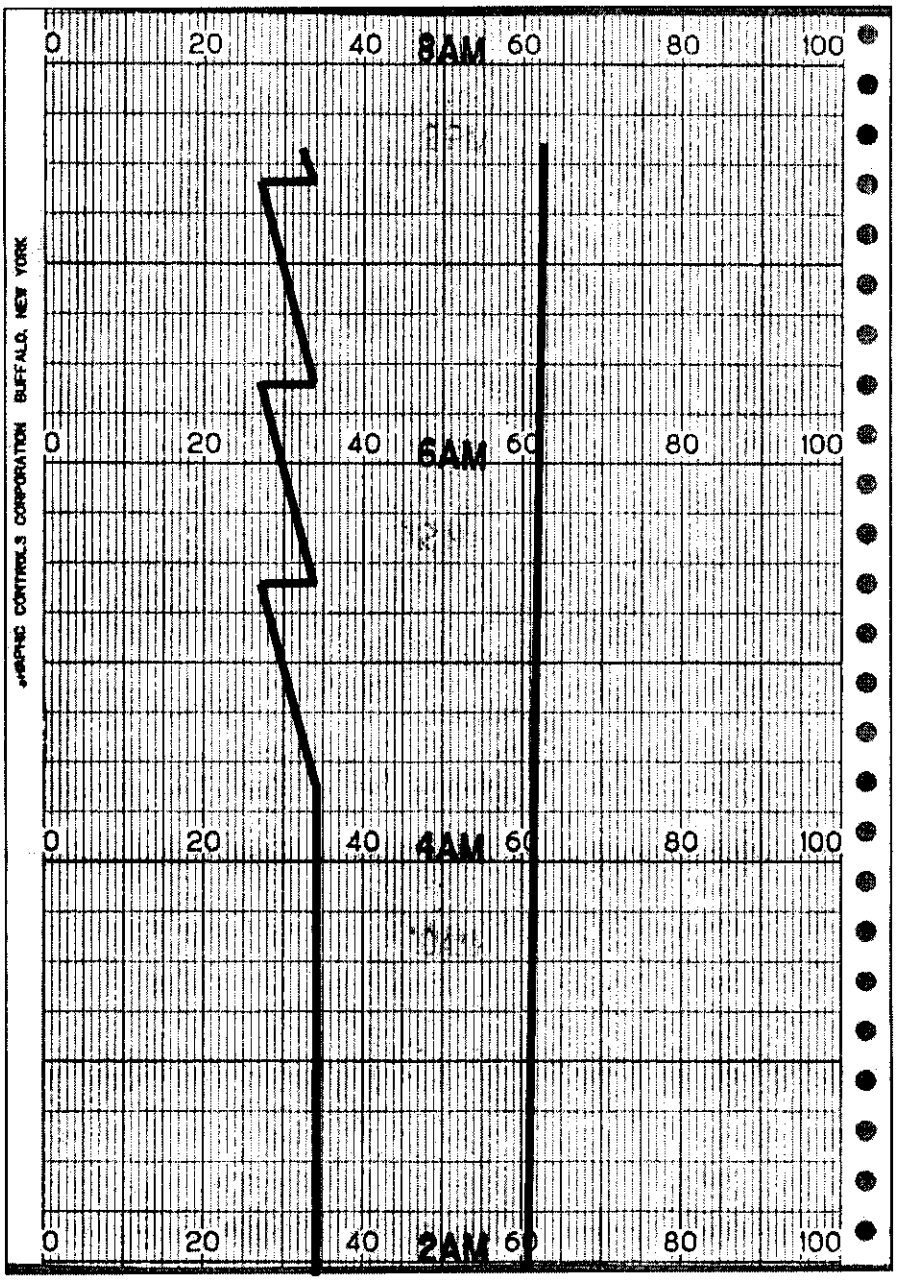
INITIATING CUES:

During a walkdown of the Control Board, the Unit 1 RO noted a change in the VCT level trend as indicated on the Trend Recorder. All other Unit parameters are stable and normal for 100% power operation.

Here is copy of the VCT level trace from the Trend Recorder (Attachment 1). The left-hand trace is VCT level and the right-hand trace is Intake Canal level. The recorder was set-up to record VCT level over a range of 0% to 100% and set at a chart speed of 1 inch per hour.

Here is a copy of 1-OPT-RC-10.01. I need you to calculate the RCS leakrate based on the change in VCT level, as indicated on this recorder trace. Only those portions of the procedure that specifically address the change in VCT level need to be completed. When you have completed your determination of the leakrate, please inform me of the value in gallons per minute.

Attachment 1



U. S. Nuclear Regulatory Commission

Region II

A-2 Administrative Section

NRC-ADMIN-JPM-05 (SRO ONLY)

Title:

Work Order Review And Approval

JPM TITLE: WORK ORDER REVIEW AND APPROVAL

JPM NUMBER: NRC-ADMIN-JPM-05

JPM REV. DATE: 03/06/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Review and Approve a Work Order for Release to Craft

REQUIRED MATERIALS:

1. None

REFERENCES:

1. VPAP-2002, WORK REQUEST AND WORK ORDER TASKS
2. VPAP-2001, STATION PLANNING AND SCHEDULING
3. 1-OPT-SI-020, CSD TEST OF CHARGING AND SAFETY INJECTION MOVS AND CHECK VALVES
4. System Drawing 11448-FM-089A, SH-003, SAFETY INJECTION SYS DIAGRAM

VALIDATION TIME: 30 Minutes.

K/A: GEN 2.2.17 (2.3/3.5)

TERMINATING CUES:

The Trainee states that the Work Order review is complete and either signs the Work Order for release or states why it can not be released.

READ TO THE TRAINEE

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.

2. You are the Desk SRO handling maintenance for your shift.

INITIATING CUES:

A Planner has just delivered a Work Order to you for adjusting the packing on 1-SI-MOV-1867C, which has a packing leak that has continued to worsen over the past week. The packing leakage was last quantified at approximately 150 mils per hour.

The breaker for 1-SI-MOV-1867C has been Tagged Out (S2-02-SI-017) and verified for this job. The STA has verified that a PRA for this job has been performed.

You are to review the Work Order and either sign it for release to the crafts or identify any issues that would prevent you from releasing the Work Order. When you complete your review, please inform me and provide justification for your decision.

Step 1: Reviews the Work Order Front Page

STANDARDS:

___ a. Verifies that the Work Order is for the correct component.
___ b. Verifies that the Task Problem is accurate.
___ c. Identifies that the Work Order is **MRULE A(4) – Risk Significant** and recalls from the pre-brief that a PRA Assessment has been performed for this emergent work.
___ d. Identifies that the Work Order specifies that a Tagout is required and recalls from the pre-brief that a Tagout has already been hung.

EVALUATOR'S NOTE:

- *If the Candidate states that he does not agree with the Tagout Boundary and will not release the Work Order for this reason, ask that he review the entire Work Order for any additional items that would prevent it's release.*

EVALUATOR'S CUES:

- If asked, a PRA Assessment has been performed for this job.
- If asked, a Tagout has been created hung for this job.

Step 2: Reviews the Work Order Job Steps

STANDARDS:

___ a. Identifies that Step 3 states that the valve can not be cycled at power, which prevents performance of the PMT at power and the release of the Work Order.
___ b. Identifies that Step 14 requires cycling the valve and performing a VOTES Test, which would prevent release of the Work Order.

EVALUATOR'S CUES:

- If asked if the PMT has been waived, report that the PMT is as he sees it.

Step 3: Reviews the PMT Test Data Sheet

STANDARDS:

___ a. Verifies that the PMT is for the correct Work Order and has the correct component Mark Number.

___ b. Identifies under the TEST DATA SHEET APPROVALS section that the PMT requires cycling the valve open and closed, which will prevent performance of the PMT under current Unit conditions.

___ c. Identifies under the MAINTENANCE VERIFICATIONS that the valve must be cycled to perform the verifications, which will prevent the performance of the PMT under current Unit conditions.

___ d. Identifies that the MAINTENANCE VERIFICATIONS have not been WAIVED.

___ e. Identifies under the POST MAINTENANCE TESTING REQUIREMENTS that 1-OPT-SI-020 is required, which requires cycling of the valve and can not be performed under the current Unit conditions.

___ f. Identifies that the POST MAINTENANCE TESTING REQUIREMENTS have not been WAIVED.

EVALUATOR'S CUES:

- If asked for a copy of 1-OPT-SI-020, provide the Candidate with the procedure.
- If asked if any PMT items have been waived, report that the PMT is as he sees it.

Step 4: Reports that the Work Order Review is completed and that the Work Order can not be released for the following reasons:

___ a. The PMT for the job can not be performed with the unit at Power, therefore the Work Order can not be released.

EVALUATOR'S CUES:

- If the Candidate states that the Work Order can not be released without providing justification, ask that he state all issues that he identified during his review.

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 is at 100% power.

2. You are the Desk SRO handling maintenance for your shift.

INITIATING CUES:

A Planner has just delivered a Work Order to you for adjusting the packing on 1-SI-MOV-1867C, which has a packing leak that has continued to worsen over the past week. The packing leakage was last quantified at approximately 150 mils per hour.

The breaker for 1-SI-MOV-1867C has been Tagged Out (S2-02-SI-017) and verified for this job. The STA has verified that a PRA for this job has been performed.

You are to review the Work Order and either sign it for release to the crafts or identify any issues that would prevent you from releasing the Work Order. When you complete your review, please inform me and provide justification for your decision.

U. S. Nuclear Regulatory Commission

Region II

A-3 Administrative Section (SRO ONLY)

Title:

CALCULATE RADIATION EXPOSURE WHEN PLACING UNIT 1 RESIDUAL HEAT REMOVAL SYSTEM IN SERVICE

JPM TITLE: CALCULATE RADIATION EXPOSURE WHEN PLACING UNIT 1 RESIDUAL HEAT REMOVAL SYSTEM IN SERVICE

JPM NUMBER: NRC-ADMIN-JPM-03

JPM REV. DATE: 03/07/02

TIME VALIDATION: 30 MINUTES

AN 'X' BELOW INDICATES THE APPLICABLE METHOD(S) OF TESTING WHICH MAY BE USED:

PERFORM:__X___ SIMULATE:_____ DISCUSS:_____

INSTRUCTOR'S INFORMATION

TASK STANDARDS:

Determines the success path for opening 1-RH-MOV-1701 is one operator traveling via the spiral staircase.

REQUIRED MATERIALS:

1. Unit 1 Containment survey maps with estimated transit times
2. Calculator

REFERENCES:

None

VALIDATION TIME: 30 Minutes.

K/A: 2.3.4 (2.5/3.1)
2.3.10 (2.9/3.3)

TERMINATING CUES:

Determines the success path for opening 1-RH-MOV-1701 is one operator traveling via the spiral staircase.

READ TO THE TRAINEE

If you have any questions, ask them now and I will answer them. During the test, I cannot answer questions. When you complete all the steps correctly, you will pass this Job Performance Measure. I will describe the general conditions for the task you will perform and provide the initiating cues.

INITIAL CONDITIONS:

1. Unit 1 has experienced a small break LOCA with a safety injection.

2. The Operating Team is attempting to place the Residual Heat Removal System in service, but they are unable to open 1-RH-MOV-1701 from the Main Control Room.

3. You have been tasked with entering Containment and locally opening 1-RH-MOV-1701.

4. Your allowable dose limit for this job is 1850 mr. Another Operator is available to assist with the same allowable dose limit.

5. General area radiation levels have been manually estimated based on installed radiation monitor readings.

6. Survey maps of the Unit 1 Containment are available, showing dose rates and one way travel time to reach the valve for each of 3 possible routes.

7. If either set of stairs is used, the estimated time in the "A" room to open the valve is 8 minutes. If the elevator is used the estimated time in the "A" room to open the valve is 6 minutes.

8. If a second operator is sent, the time to open the valve will be halved (4 minutes if the stairs are used, 3 minutes if the elevator is used).

9. Health Physics personnel are currently unavailable to provide assistance for dose determination.

INITIATING CUES:

You have been directed to determine:

1) The dose that will be received for each roundtrip path and which roundtrip path would result in the lowest radiation exposure.

2) If 1-RH-MOV-1701 can be opened locally by you without exceeding your dose margin limit.

3) How many Operators are required to accomplish the job with the minimum total job dose.

( ) ELEMENT: 1

Calculate exposure at valve.

STANDARDS:

__ 1. For stairway travel (6 R/HR)(1000 MR/R)(1 HR/60 MIN)(8 MIN)= 800 MR

__ 2. For elevator travel (6 R/HR)(1000 MR/R)(1 HR/60 MIN)(6 MIN)= 600 MR

EVALUATOR'S NOTES:

NOTE: The operator may perform the calculations in any order.

( ) ELEMENT: 2

Calculate exposure from using elevator.

STANDARDS:

___ 1. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(3 MIN)(2 TRIPS) = 300 MR. (Personnel Hatch to Elevator Door)

___ 2. (2 R/HR)(1000 MR/R)(1 HR/60 MIN)(1 MIN)(2 TRIPS) = 67 MR. (Elevator ride)

___ 3. (12 R/HR)(1000 MR/R)(1 HR/60 MIN)(2 MIN)(2 TRIPS) = 800 MR. (Elevator door to valve)

___ 4. (300 MR)+(66 MR)+(800 MR) + (600 MR) = 1766 MR TOTAL DOSE.

EVALUATOR'S NOTES:

NOTE: Total exposure via this path including time at the valve: 1766 mr (.2 points).

( ) ELEMENT: 3

Calculate exposure from using stairway.

STANDARDS:

___ 1. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(1 MIN)(2 TRIPS) = 100 MR. (Personnel Hatch to Stairway)

___ 2. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(3 MIN)(2 TRIPS) = 300 MR. (Stairway)

___ 3. (12 R/HR)(1000 MR/R)(1 HR/60 MIN)(2 MIN)(2 TRIPS) = 800 MR. (Stairway on –3'6" to valve)

___ 4. (100 MR)+(300 MR)+(800 MR)+(800MR) = 2000 MR TOTAL DOSE.

EVALUATOR'S NOTES:

NOTE: Total exposure via this path including time at the valve: 2000 mr (.2 points)

( ) ELEMENT: 4

Calculate exposure from using spiral staircase.

STANDARDS:

___ 1. (1 R/HR)(1000 MR/R)(1 HR/60 MIN)(2 MIN)(2 TRIPS) = 67 MR. (Personnel Hatch to Spiral Staircase)

___ 2. (3 R/HR)(1000 MR/R)(1 HR/60 MIN)(3 MIN)(2 TRIPS) = 300 MR. (Spiral Staircase)

___ 3. (4 R/HR)(1000 MR/R)(1 HR/60 MIN)(4 MIN)(2 TRIPS) = 533 MR. (Spiral Staircase on –3'6" to valve)

___ 4. (67 MR)+(300 MR)+(533 MR)+(800) = 1700 MR.

EVALUATOR'S NOTES:

NOTE: Total exposure via this path including time at the valve: 1700 mr. (.4 points)

( ) ELEMENT: 5

Determine lowest exposure path and compare to allowable dose.

STANDARDS:

___ 1. Compared results of three calculations and determines the path using the spiral staircase to be the lowest exposure.

EVALUATOR'S NOTES:

Determines only Elevator and spiral staircase are acceptable paths.
Spiral staircase is lowest dose travel path.

( ) ELEMENT: 6

STANDARDS:

___ 2. Determines the task can be performed within the given exposure limits.

EVALUATOR'S NOTES:

Determines the task can be performed within the given exposure limits (.1 Points)

( ) ELEMENT: 7

Determine if extra Operator is beneficial.

STANDARDS:

___ 1. Determines two Operator dose using spiral staircase.

___ 2. (6 R/HR)(1000 MR/R)(1 HR/60 MIN)(4 MIN)(2 Operators) = 800 MR.

___ 3. ((67 MR)+(300 MR)+(533 MR))*2 Operators +(800MR) = 2600 MR.

Operator may apply logic that the same dose will be expended at the valve, and from an ALARA standpoint, the dose to travel to and from the valve is unwarranted.

EVALUATOR'S NOTES:

Determines no extra Operator is beneficial. (.1 points)

****** TERMINATE JPM AT THIS POINT ******

INITIAL CONDITIONS:

1. Unit 1 has experienced a small break LOCA with a safety injection.

2. The Operating Team is attempting to place the Residual Heat Removal System in service, but they are unable to open 1-RH-MOV-1701 from the Main Control Room.

3. You have been tasked with entering Containment and locally opening 1-RH-MOV-1701.

4. Your allowable dose limit for this job is 1850 mr. Another Operator is available to assist with the same allowable dose limit.

5. General area radiation levels have been manually estimated based on installed radiation monitor readings.

6. Survey maps of the Unit 1 Containment are available, showing dose rates and one way travel time to reach the valve for each of 3 possible routes.

7. If either set of stairs is used, the estimated time in the "A" room to open the valve is 8 minutes. If the elevator is used the estimated time in the "A" room to open the valve is 6 minutes.

8. If a second operator is sent, the time to open the valve will be halved (4 minutes if the stairs are used, 3 minutes if the elevator is used).

9. Health Physics personnel are currently unavailable to provide assistance for dose determination.

INITIATING CUES:

You have been directed to determine:

1) Which roundtrip path would result in the lowest radiation exposure.

2) If 1-RH-MOV-1701 can be opened locally by you without exceeding your dose margin limit.

3) How many Operators are required for the job with the minimal total job dose.

RESULTS:

Dose received for each travel path:

ELEVATOR: _____

STAIRWAY: _____

SPIRAL STAIRCASE: _____

Recommended path:

_____

Can the Alignment be completed within your Dose Limit?

_____ _____
YES NO

Is an extra Operator recommended to lower the total dose for the task?

_____ _____
YES NO

NEW NRC JPM

SRO A-4

Operator _____ Evaluator _____

Observer _____ Evaluation Date _____

Task

Determine event reportability/classification

Applicability	**Est Completion Time**	**Actual Time**
SRO ONLY	2 Minutes	_____

NUREG-1122 Importance Ratings
GEN2.4.30 (RO 2.2/SRO 3.6)

Conditions

- Task is to be PERFORMED in area which has adequate reference material.

Standards

- 8 hour notification IAW VPAP 2802, section 6.3.5.a.3

Initiating Cues

- Notification of significant event.
- EPIP-1.01, Emergency Manager Controlling Procedure.

Terminating Cues

- Notification type and specification determined.

Procedures

- EPIP-1.01, Emergency Manager Controlling Procedure.
- VPAP 2802, Notifications and Reports

Tools and Equipment

- None

Safety Considerations

- None

Performance Checklist

Directions to the Operator.

- You are the Shift Supervisor. At 0300, with Unit 1 at 100% power, the 1C Charging pump was in service and tripped. The 1B charging pump is tagged for maintenance and the 1A Charging pump failed to automatically start, but was immediately started from the Main Control Board.

- At 0302, personnel in the area noted light smoke coming from the 1C Charging Pump motor and an acrid odor.

- At 0305, the Fire Brigade reported to the scene and sprayed the smoking motor with CO_2, as a precaution, verified the supply breaker open and reported that no open flames were observed.

- Make all necessary classifications and notifications.

- When you finish the actions necessary to accomplish this, please inform me of your findings and action, as applicable.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 1 before 3.
- **START TIME:** _____

---

1. OBTAIN EPIP-1.01, EMERGENCY MANAGER CONTROLLING PROCEDURE.

   Standards

   (a) Proceeds to SS console bookrack.
   (b) Obtains SEM emergency package (or STA classification package).
   (c) Gets copy of EPIP-1.01, EAL Tabs.

   Evaluator's Comments
   Applicant my go to VPAP 2802 first and skip steps 1 and 2

---

2. DETERMINE EVENT CATEGORY.

   Standards

   Determines event to be NONE emergency.

   Evaluator's Comments

---

* 3. OBTAIN VPAP 2802, NOTIFICATIONS AND REPORTS.

   Standards

   * Obtains copy of VPAP 2802.

   Evaluator's Comments

* 4. DETERMINES TYPE OF NOTIFICATION

Standards

*(a) Determines that event is an 8 hour notification, per section 6.3.5.a.3, unplanned actuation of ECCS system, HHSI pump 1A

CUES

Evaluator's Comments

STOP TIME: _____

NEW NRC JPM

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

Determine event reportability/classification

Applicability	**Est Completion Time**	**Actual Time**
SRO ONLY	2 Minutes	_____

NUREG-1122 Importance Ratings
GEN2.4.30 (RO 2.2/SRO 3.6)

Conditions

- Task is to be PERFORMED in area which has adequate reference material.

Standards

- 8 hour notification IAW VPAP 2802, section 6.3.5.a.3

Initiating Cues

- Notification of significant event.
- EPIP-1.01, Emergency Manager Controlling Procedure.

Terminating Cues

- Notification type and specification determined.

Procedures

- EPIP-1.01, Emergency Manager Controlling Procedure.
- VPAP 2802, Notifications and Reports

Tools and Equipment

- None

Safety Considerations

- None

Performance Checklist

Directions to the Operator.

- You are the Shift Supervisor. At 0300, with Unit 1 at 100% power, the 1C Charging pump was in service and tripped. The 1B charging pump is tagged for maintenance and the 1A Charging pump failed to automatically start, but was immediately started from the Main Control Board.

- At 0302, personnel in the area noted light smoke coming from the 1C Charging Pump motor and an acrid odor.

- At 0305, the Fire Brigade reported to the scene and sprayed the smoking motor with CO_2, as a precaution, verified the supply breaker open and reported that no open flames were observed.

- At 0430, the plant commences a controlled shutdown.

- Make all necessary classifications and notifications.

- When you finish the actions necessary to accomplish this, please inform me of your findings and action, as applicable.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 1 before 3.
- **START TIME:** _____

---

1. OBTAIN EPIP-1.01, EMERGENCY MANAGER CONTROLLING PROCEDURE.

   Standards

   (a) Proceeds to SS console bookrack.
   (b) Obtains SEM emergency package (or STA classification package).
   (c) Gets copy of EPIP-1.01, EAL Tabs.

   Evaluator's Comments
   Applicant my go to VPAP 2802 first and skip steps 1 and 2

---

2. DETERMINE EVENT CATEGORY.

   Standards

   Determines event to be NONE emergency.

   Evaluator's Comments

---

* 3. OBTAIN VPAP 2802, NOTIFICATIONS AND REPORTS.

   Standards

   * Obtains copy of VPAP 2802.

   Evaluator's Comments

* 4. DETERMINES TYPE OF NOTIFICATION

Standards

*(a) Determines that event is an 8 hour notification, per section 6.3.5.a.3, unplanned actuation of ECCS system, HHSI pump 1A

CUES

Evaluator's Comments **STOP TIME:** _____

15.1.a

PERFORM THE IMMEDIATE OPERATOR ACTIONS FOR A LOSS OF MAIN FEEDWATER FLOW
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	01/31/01	Create new JPM	S01-0047

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 26.08 (Rev 00)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

PERFORM THE IMMEDIATE OPERATOR ACTIONS FOR A LOSS OF MAIN FEEDWATER FLOW.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	8 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
APE/054/AA2.02 (RO 4.1/SRO 4.4)	RO 3.93/SRO 3.78

Conditions

- Task is to be PERFORMED in the simulator.
- Unit is at 100% power with all systems normal and in automatic with the exception of rod control which is in manual due to hunting while in auto.

Standards

- Steps 1 through 5 of AP-21.00 performed without reference to the AP.

Initiating Cues

- Shift Supervisor direction

Terminating Cues

- Completion of immediate action steps (1-AP-21.00, step 5 completed).

Procedures

- 1-AP-21.00, Loss of Main Feedwater Flow.

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Simulator Setup

- Call up 100% IC and initialize.
- Place Rod Control in manual
- Lamp Override MOVFW150A(B)_GREEN, 0 Sec TD, O/R OFF
- Using Simloch: FWMOV150A(B)on screen (Set value = .1 on evaluator cue "Place Simulator in Run"; Simulator should be in run when trainee enters).

PERFORMANCE CHECKLIST

Directions to the Operator.

- I am the Shift Supervisor. Unit 1 is at 100% power with all systems in normal and automatic with the exception of rod control which is in manual due to excessive hunting while in auto. Rods will respond as designed if placed in auto.
- A unit transient is about to occur. You are to perform any immediate operator actions necessary to respond to this transient.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- This task is to be PERFORMED.
- When trainee ready to perform this task, state "Place the Simulator in Run" to cue the booth operator to set the selected MFP Discharge MOV position = 0.1.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: None.
- **START TIME:** _____

---

1. VERIFY AT LEAST ONE MFP RUNNING.

Standards

(a) Identifies SG NR level deviation alarms.
(b) Identifies both MFPs running by observing amps, red breaker indicating lights lit.
(c) Identified affected MFP amps ~260, unaffected MFP amps ~420.
(d) Identifies SF/FF mismatch

CUES

- **If asked:** Affected MFP amps ~260, unaffected MFP amps ~420
- **If Asked:** SF/FF mismatch of ~.5 x 10^6 lbm/hr on all three SGs

Evaluator's Note

If trainee opts to trip the reactor based on indications associated with this event prior to attempting AP-21.00 actions, this would constitute failure criteria.

Evaluator's Comments

---

* 2. START A THIRD CN PUMP

Standards

*(a) Places the control switch for "A" Condensate pump, 1-CN-P-1A, to the START position.
(b) Checks "A" CN pump starts (red light on & green light off) and amps indicated.
(c) Identifies SF/FF mismatch still evident and SG NR levels still decreasing.
(d) Identifies FRV demand >100% (FRVs full open, red light on, green off).

CUES

- **If asked:** After starting "A" CN pump, SF/FF mismatch has decreased but a mismatch still exists, and SG NR levels still decreasing.

Evaluator's Comments

---

* 3. REDUCE TURBINE LOAD TO MATCH STEAM FLOW WITH FEED FLOW

Standards

*(a) Decreases turbine load using valve position limiter to match SF and FF
(b) Places Rod control in automatic to compensate for Tave/Tref mismatch, OR manually inserts control rods.
(c) Further adjusts turbine load using limiter, as necessary, until SF>FF and SG NR levels begin recovering.
(d) Identifies FRV demand ~80% and indicate intermediate (green and red lights on).

CUES

- **If asked:** Rod control will function if placed in auto.

Evaluator Note

Limiter should be used to reduce turbine load to ~800 MW. Rods should be placed in auto prior to or when Tave/Tref deviation annunciator alarm received. MW will stabilize out at ~760 MW when rod control has mitigated the Tave/Tref mismatch.

If trainee action or lack of action leads to a condition where a manual reactor trip is required or if an automatic reactor trip is actuated, this would constitute failure criteria.

Evaluator's Comments

---

4. REPORT TO SHIFT SUPERVISOR

Standards

Verbal status report made of task completion.

Evaluator's Comments **STOP TIME:** _____

B. 1. b

RECOVER A DROPPED CONTROL ROD
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	08/29/91		
02	1	09/18/91	Enhance setup directions/clarify question 1 stem by modifying to a "D" bank rod.	
03	2	05/14/92	Revision of AP-1.01.	
04	3	05/21/92	Ensure HO-1 wording matched Q-1 wording/editorial changes.	
05	4	09/03/93	Rev. 7 formatting changes.	
06	5	09/23/93	Update IAW AP-1.01 and JPM standards. .	S93-1130
07	6	08/18/95	Reflect O-AP-1.01 (Rev. 9) changes; labeling errors; add question references.	S95-0785
08	7	08/20/96	KA #/procedure changes; component label verification.	S96-0267
09	8	07/31/97	Reflect current procedure and JPM templates; enhance guidance & cues.	S97-0604
10	9	03/20/98	Delete JPM # from trainee handouts.	S98-0286
11	10	12/09/98	Convert to Word.	S98-0936

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 65.03 (Rev 10)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

RECOVER A DROPPED CONTROL ROD.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	15 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
APE003.AA1.02 (RO 3.6/SRO 3.4) APE003.AA1.03 (RO 3.6/SRO 3.3) APE003.AA2.01 (RO 3.7/SRO 3.9)	RO 3.38/SRO 3.44

Conditions

- Task is to be PERFORMED in the simulator.
- A single dropped RCCA (P-10) has occurred. Reactor power has been reduced to 60% power and stabilized. AP-1.00 has been performed through step 11 and transition made to AP-1.01, step 4 where it has been performed through step 10.

Standards

- Rod P-10 fully withdrawn IAW 0-AP-1.01, Control Rod Misalignment.

Initiating Cues

- 0-AP-1.01, Control Rod Misalignment, step 11.
- Shift Supervisor direction.

Terminating Cues

- 0-AP-1.01, Control Rod Misalignment, step 24 completed.

Procedures

- 0-AP-1.01, Control Rod Misalignment.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 60% power IC, enable group step counters & initialize. Verify all group step counters reading correctly.
- Call up rod control screen on PEDS and display CBA's P-to-A converter or from SIMLOCH call up variable "RODPOS_DEMAND_A" and be prepared to set equal to zero.
- Enter malf for dropped RCCA P-10 (MRD1224). Perform 0-AP-1.00 through step 11 and transition to 0-AP-1.01 step 4, perform through step 10 and stabilize plant.
- Sign off copy of 0-AP-1.01, Control Rod Misalignment, from step 4 through step 10.
- Set up analog trend recorders for Tave and Tref 555-565°F.
- **REMOVE MALFUNCTION** (MRD1224) & freeze simulator until ready to perform JPM.

Performance Checklist

Directions to the Operator.

- I am the Shift Supervisor. Control rod P-10 dropped about 1 hour ago due to a blown fuse. The unit has been stabilized and the Instrument Techs have repaired the fuse. A pre-job brief has been held and we are now ready to withdraw the rod.
- Here's a copy of AP-1.01, I want you to recover the dropped control rod starting at step 11.
- When you finish the actions necessary to accomplish this and return the rods to MANUAL, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 2-4,9 & 10 (any order) before 11; 11-12-13-14.
- **START TIME:** _____

---

1. REVIEW CAUTIONS PRIOR TO STEP 11.

   Standards

   (a) Notes that this procedure is NOT valid for realignment of a control rod if Reactor is subcritical.
   (b) Notes that realignment SHALL be performed with power held constant at less than or equal to 75%.

   Evaluator's Comments

---

2. RESET NIS ROD DROP SIGNAL.

   Standards

   (a) Examines NIS PR channels (N-41,42,43,44) for actuated DROPPED ROD ROD STOP BISTABLE.
   (b) Takes POWER RANGE TEST Switch for all affected NIS channels from NORMAL to RESET and return to NORMAL.
   (c) Checks annunciator G-H-1 (NIS DROPPED ROD FLUX DECREASE >5% PER 2 SEC) cleared.

   Evaluator's Comments

---

* 3. TRANSFER ROD CONT MODE SEL SWITCH TO AFFECTED BANK.

Standards

*(a) Rotates ROD CONT MODE SEL SWITCH from the MANUAL to the CBA position.
(b) Verifies rod speed indication of 48 spm on ROD SPEED SI-1-408.

Evaluator's Comments

---

* 4. ALIGN LIFT COIL DISCONNECT SWITCHES FOR AFFECTED BANK.

Standards

(a) Proceeds behind Vertical Board 1-2 to Lift Coil Disconnect Switch Panel and opens panel door.
*(b) Places all disconnect switches for affected bank in "disconnect".
- *. F-2
- *. B-10
- *. K-14
- *. P-6
- *. K-2
- *. B-6
- *. F-14
- . P-10

(c) Places switch for P-10 in "connect.
(d) Requests alignment of Lift Coil Disconnect Switches to be independently verified.

CUES

- **If asked:** Lift Coil Disconnect Switches have been independently verified.

Evaluator's Comments

---

5. RECORD AFFECTED BANK POSITION.

Standards

Records Group 1 and 2 step counter readings for Bank A.

Evaluator's Comments

---

6. REVIEWS CAUTIONS PRIOR TO STEP 16.

Standards

Notes that the affected speed during realignment is limited to 2/P (P=fraction of Core Power where 100% power is equal to 1.0) steps per hour if affected rod remains misaligned for more than 12 hours or the duration of misalignment can NOT be determined. This limit may be relaxed with authorization from the Reactor Engineer or Nuclear Analysis and Fuels.

CUES

- **If asked:** Reactor Engineering has authorized that the 2/P rod speed limit be relaxed. No limit on rod speed is required.

Evaluator's Comments

---

7. RECORDS REACTOR POWER AND ROD WITHDRAWAL RATE.

Standards

(a) Checks reactor power by monitoring Benchboard power range meters, meters on the NIS power range drawers, loop delta T meters etc... and records value in the appropriate blank.
(b) Determines rod withdrawal rate at 48 spm and records value in the appropriate blank.

CUES

- **If asked:** Do not exceed 70% power, a 1 dpm SUR or temperature >565°F during dropped rod recovery.

Evaluator's Comments

---

8. CHECKS AFFECTED ROD ON BOTTOM.

Standards

(a) Reads NOTE prior to step 17 explaining reason for ROD CONT SYS URGENT FAILURE alarm.
(b) Checks rod P-10 on bottom.

CUES

- **If asked:** Rod P-10 is on the bottom.

Evaluator's Comments

---

* 9. RESET AFFECTED GROUP STEP COUNTER.

Standards

Pulses Group Step Counter for CONT BANK A GP 2 from fully withdrawn height to a reading of 000 steps.

Evaluator's Comments

---

* 10. RESET AFFECTED BANK'S P/A CONVERTER.

Standards

(a) Contacts an auxiliary operator.
(b) Directs AO to go to Unit 1's P/A converter in relay room.
*(c) Directs AO to reset "A" bank P/A converter (pulse P/A cnvtr for CBA from fully withdrawn down to 000 steps).
(d) Acknowledges the following annunciators:
- G-G-5 (ROD BANK A LO LIMIT)
- G-H-5 (ROD BANK A EXTRA LO LIMIT).

(e) Identifies trend recorder TR-1409A pen 2 tracks to 0.

CUES

- After directed, the simulator instructor should perform TIME COMPRESSION, reset CBA P/A converter to 000 using Simlock variable RODPOS_DEMAND_A or using PEDs display and then notify the RO.

Evaluator's Comments

---

* 11. REALIGN AFFECTED ROD TO ITS BANK POSITION.

Standards

*(a) Places SHUTDN AND CONT ROD CONT SWITCH to the OUT position.
(b) Verifies outward rod motion indicated by observing affected rod IPRI.
(c) Acknowledges annunciator G-A-6 (ROD CONT SYS URGENT FAILURE).
*(d) Withdraws affected rod to required position.
(e) Continuously monitors SUR, PR NI's, IR NI's, ΔT, Tave, group step counters, IRPI, rod speed, out indication light and TR-1-409A.

Evaluator's Comments

---

* 12. CLOSE AFFECTED BANK LIFT COIL DISCONNECT SWITCHES.

Standards

(a) Proceeds behind Vert Bd 1-2 to Lift Coil Disconnect Switch Panel.
*(b) Closes disconnect switches for affected bank (F-2, B-10, K-14, P-6, K-2, B-6 & F-14).
(c) Request alignment of Lift Coil Disconnect Switches to be independently verified.

CUES

- **If asked:** Lift Coil Disconnect Switches have been independently verified.

Evaluator's Comments

---

* 13. RESET ROD CONTROL URGENT FAILURE.

Standards

*(a) Momentarily depresses ROD CONT SYS INTERNAL ALARM RESET pushbutton.
(b) Verifies annunciator G-A-6 (ROD CONT SYS URGENT FAILURE) clears.

Evaluator's Comments

---

* 14. TRANSFER ROD CONTROL TO MANUAL.

Standards

Rotates ROD CONT MODE SELECT Switch from the CBA position to the MANUAL position.

Evaluator's Comments

---

15. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that rod withdrawn and rod control in manual.

Evaluator's Comments **STOP TIME:** _____

Evaluation Items

The following question is related to the task that has just been performed. However, the conditions have been changed. Please indicate when you have finished answering the question.

1. Assume that the dropped rod was in "D" bank. Following the realignment of the rod to the pre-dropped bank height of 150 steps, it was discovered that a second affected bank disconnect switch was inadvertently left in the CLOSED position.

   Briefly explain the problem this would create.

ANSWER

The affected rod was stepped out with the dropped rod (0.50) and would be out of alignment (0.50) (above the Tech Spec limit of +/- 12 steps).

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
APE003.AK3.04 RO3.8/SRO4.1	2 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED?
• NCRODP SSM-65	NO
• ND-93.3-LP-3	NO

Evaluation Items
(Continued)

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. Assume that as you begin to withdraw the dropped control rod, a second rod (one in control bank D) drops to the bottom.

   What action would you now take in response to having 2 rods at the bottom of the core?

ANSWER

Would manually trip the reactor (and initiate E-0).

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
APE003.AK3.04 RO3.6/SRO3.8	1 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED?
• 0-AP-1.00	YES

Evaluator's Summary
Job Performance Measure 65.03 (Rev 10)
RECOVER A DROPPED CONTROL ROD

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 65.03 (Rev 10)
RECOVER A DROPPED CONTROL ROD

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **15 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

Licensed Operator Programs
FOLLOW UP QUESTION PERFORMANCE SUMMARY
Job Performance Measure 65.03 (Rev 10)
RECOVER A DROPPED CONTROL ROD

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

QUESTION #1: N/A _____ Fractional Score _____ Final Score: 1 / 0
(≥0.7 = 1 or <0.7 = 0)

Est Completion Time: **2 Min** Actual Completion Time: _____

Comments: _____

QUESTION #2: N/A _____ Fractional Score _____ Final Score: 1 / 0
(≥0.7 = 1 or <0.7 = 0)

Est Completion Time: **1 Min** Actual Completion Time: _____

Comments: _____

Evaluation Items

Question 2 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. Assume that as you begin to withdraw the dropped control rod, a second rod (one in control bank D) drops to the bottom.

   What action would you now take in response to having 2 rods at the bottom of the core?

Evaluation Items

Question 1 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. Assume that the dropped rod was in "D" bank. Following the realignment of the rod to the pre-dropped bank height of 150 steps, it was discovered that a second affected bank disconnect switch was inadvertently left in the CLOSED position.

   Briefly explain the problem this would create.

Conditions

- Task is to be PERFORMED in the simulator.
- A single dropped RCCA (P-10) has occurred. Reactor power has been reduced to 60% power and stabilized. AP-1.00 has been performed through step 11 and transition made to AP-1.01, step 4 where it has been performed through step 10.

Initiating Cues

- 0-AP-1.01, Control Rod Misalignment, step 11.
- Shift Supervisor direction.

Directions

- I am the Shift Supervisor. Control rod P-10 dropped about 1 hour ago due to a blown fuse. The unit has been stabilized and the Instrument Techs have repaired the fuse. A pre-job brief has been held and we are now ready to withdraw the rod.
- Here's a copy of AP-1.01, I want you to recover the dropped control rod starting at step 11.
- When you finish the actions necessary to accomplish this and return the rods to MANUAL, please inform me.

B.1.C

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 38.03 (Rev 07)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

VERIFY NATURAL CIRCULATION FLOW.

Applicability

RO/SRO

Est Completion Time

Actual Time

_____

NUREG-1122 Importance Ratings

SYS002.A2.03 (RO 4.1/SRO 4.3)
EPE017.EK1.01 (RO 4.4/SRO 4.6)
SYS002.K5.13 (RO 3.3/SRO 3.6)

Surry Importance Rating

Conditions

- Task is to be PERFORMED in the simulator.
- Approximately 10 minutes has elapsed since a Reactor Trip (without SI initiation) and a loss of all RCPs has occurred.
- Operator is given a copy of 1-ES-0.1, step 17.

Standards

- 1-ES-0.1, Reactor Trip Response, step 17.

Initiating Cues

- 1-ES-0.1, Reactor Trip Response, step 17.
- Shift Supervisor direction.

Terminating Cues

- Completion of 1-ES-0.1, Reactor Trip Response, step 17.

Procedures

- 1-ES-0.1, Reactor Trip Response.

Tools and Equipment

- Curve Book

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize. Place simulator in RUN.
- Trip Rx, allow conditions to stabilize, place RCPs in PTL, initiate slow cooldown using steam dumps to enhance NC flow. Run in this mode for ~10 minutes to establish NC flow indications.
- Place simulator in freeze until ready for JPM performance.

Performance Checklist

Directions to the Operator.

- I am the Shift Supervisor. A reactor trip with a loss of all RCPs occurred approximately 10 minutes ago. 1-E-0, Rx Trip or SI, has been completed and 1-ES-0.1 has been performed up to step 16.
- Here's a copy of ES-0.1. I need you to verify natural circulation flow in accordance with step 17.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*).
- Critical step sequencing requirements: None.
- **START TIME:** _____

---

* 1. VERIFY RCS SUBCOOLING BASED ON CETCS - GREATER THAN 30°F [85°F].

Standards

Observes ICCM display Train A and/or Train B indication of CETC subcooling to verify greater than 30°F.

Evaluator's Comments

---

* 2. VERIFY CETC TEMPERATURES - STABLE OR DECREASING.

Standards

Observes CETC temperatures on ICCM Train A and/or Train B for a stable or decreasing trend.

Evaluator's Comments

---

3. CHECK SG PRESSURES - STABLE OR DECREASING.

Standards

Observes the following meters for indications of stable or decreasing SG pressure.

- "A" SG : MS-PI-1-474, MS-PI-1-475 and/or MS-PI-1-476.
- "B" SG : MS-PI-1-484, MS-PI-1-485 and/or MS-PI-1-486.
- "C" SG : MS-PI-1-494, MS-PI-1-495 and/or MS-PI-1-496.

Evaluator's Comments

---

4. VERIFY WIDE RANGE RCS HOT LEG TEMPERATURES - STABLE OR DECREASING.

Standards

Observes the following WR RCS temperature recorders for indications of stable or decreasing Th temperatures:

- "A" loop : RC-TR-1-413 (green pen).
- "B" loop : RC-TR-1-423 (green pen).
- "C" loop : RC-TR-1-433 (green pen).

Evaluator's Comments

---

5. VERIFY WIDE RANGE RCS COLD LEG TEMPERATURES - AT SATURATION TEMPERATURE FOR SG PRESSURE BASED ON SATURATION CURVE IN CURVE BOOK.

Standards

(a) Notes the following pressure indicators for SG pressure:
- "A" SG : MS-PI-1-474, MS-PI-1-475 and/or MS-PI-1-476.
- "B" SG : MS-PI-1-484, MS-PI-1-485 and/or MS-PI-1-486.
- "C" SG : MS-PI-1-494, MS-PI-1-495 and/or MS-PI-1-496.

(b) Takes SG pressure value and finds associated saturation temperature value from curve book (curve number 2 or 3) or from Steam Tables.

(c) Compares the saturation temperature value to the following WR RCS temperature recorders:
- "A" loop : RC-TR-1-413 (red pen).
- "B" loop : RC-TR-1-423 (red pen).
- "C" loop : RC-TR-1-433 (red pen).

Evaluator's Comments

---

* 6. Determines natural circulation DOES NOT exist.

Standards

Attempts to dump steam via Steam Dumps to condenser.
Steam dumps DO NOT operate.
Dumps steam to atmosphere with SG PORVs.

Evaluator's Comments _____

---

* 7. VERIFY RCS SUBCOOLING BASED ON CETCS - GREATER THAN 30°F [85°F].

Standards

Observes ICCM display Train A and/or Train B indication of CETC subcooling to verify greater than 30°F.

Evaluator's Comments

---

* 8. VERIFY CETC TEMPERATURES - STABLE OR DECREASING.

Standards

Observes CETC temperatures on ICCM Train A and/or Train B for a stable or decreasing trend.

Evaluator's Comments

---

9. CHECK SG PRESSURES - STABLE OR DECREASING.

Standards

Observes the following meters for indications of stable or decreasing SG pressure.

- "A" SG : MS-PI-1-474, MS-PI-1-475 and/or MS-PI-1-476.
- "B" SG : MS-PI-1-484, MS-PI-1-485 and/or MS-PI-1-486.
- "C" SG : MS-PI-1-494, MS-PI-1-495 and/or MS-PI-1-496.

Evaluator's Comments

---

10. VERIFY WIDE RANGE RCS HOT LEG TEMPERATURES - STABLE OR DECREASING.

Standards

Observes the following WR RCS temperature recorders for indications of stable or decreasing Th temperatures:

- "A" loop : RC-TR-1-413 (green pen).
- "B" loop : RC-TR-1-423 (green pen).
- "C" loop : RC-TR-1-433 (green pen).

Evaluator's Comments

---

11. VERIFY WIDE RANGE RCS COLD LEG TEMPERATURES - AT SATURATION TEMPERATURE FOR SG PRESSURE BASED ON SATURATION CURVE IN CURVE BOOK.

Standards

(a) Notes the following pressure indicators for SG pressure:
- "A" SG : MS-PI-1-474, MS-PI-1-475 and/or MS-PI-1-476.
- "B" SG : MS-PI-1-484, MS-PI-1-485 and/or MS-PI-1-486.
- "C" SG : MS-PI-1-494, MS-PI-1-495 and/or MS-PI-1-496.

(b) Takes SG pressure value and finds associated saturation temperature value from curve book (curve number 2 or 3) or from Steam Tables.

(c) Compares the saturation temperature value to the following WR RCS temperature recorders:
- "A" loop : RC-TR-1-413 (red pen).
- "B" loop : RC-TR-1-423 (red pen).
- "C" loop : RC-TR-1-433 (red pen).

Evaluator's Comments

---

12. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made.

Evaluator's Comments **STOP TIME:** _____

Evaluation Items

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. In relation to natural circulation, what potential problem does boiling due to low subcooling create?

ANSWER

If boiling does occur in sufficient quantities, it is possible that it could significantly retard or interrupt NC flow.

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
SYS002.K5.15 RO4.2/SRO4.6	1 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED
ND-86.3-LP-4	No
NCRODP-SSM-38, RCS	No

Evaluation Items
(Continued)

The following question is related to the task that has just been performed. Please indicate when you have finished answering the question.

2. Assume that during the Natural Circulation verification, another operator noticed SG levels were at 18% NR. Since this is below the normal operating level for HSD, he rapidly restored the levels to 33% NR using Auxiliary Feedwater flow.

   What potential problem associated with Natural Circulation could this operator have just created by the rapid level increases?

ANSWER

The rapid level restoration using "cold" AFW has potentially caused thermal blockage (interruption or cold blocking) of NC flow.

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
APE017.AK3.07 RO4.1/SRO4.2	2 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED
Executive Volume, Generic Issues, Stagnant RCL Section	No

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 38.03 (Rev 07)
VERIFY NATURAL CIRCULATION FLOW

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **5 Min** Actual Time: **___ Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☒

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Licensed Operator Programs
FOLLOW UP QUESTION PERFORMANCE SUMMARY
Job Performance Measure 38.03 (Rev 07)
VERIFY NATURAL CIRCULATION FLOW

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

QUESTION #1: N/A _____ Fractional Score _____ Final Score: 1 / 0
($\geq$0.7 = 1 or <0.7 = 0)

Est Completion Time: **1 Min** Actual Completion Time: _____

Comments: _____

QUESTION #2: N/A _____ Fractional Score _____ Final Score: 1 / 0
($\geq$0.7 = 1 or <0.7 = 0)

Est Completion Time: **2 Min** Actual Completion Time: _____

Comments: _____

Evaluation Items

Question 2 Operator Handout

The following question is related to the task that has just been performed. Please indicate when you have finished answering the question.

2. Assume that during the Natural Circulation verification, another operator noticed SG levels were at 18% NR. Since this is below the normal operating level for HSD, he rapidly restored the levels to 33% NR using Auxiliary Feedwater flow.

   What potential problem associated with Natural Circulation could this operator have just created by the rapid level increases?

Evaluation Items

Question 1 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. In relation to natural circulation, what potential problem does boiling due to low subcooling create?

Conditions

- Task is to be PERFORMED in the simulator.
- Approximately 10 minutes has elapsed since a Reactor Trip (without SI initiation) and a loss of all RCPs has occurred.
- Operator is given a copy of 1-ES-0.1, step 17.

Initiating Cues

- 1-ES-0.1, Reactor Trip Response, step 16.
- Shift Supervisor direction.

Directions

- I am the Shift Supervisor. A reactor trip with a loss of all RCPs occurred approximately 10 minutes ago. 1-E-0, Rx Trip or SI, has been completed and 1-ES-0.1 has been performed up to step 16.
- Here's a copy of ES-0.1. I need you to verify natural circulation flow in accordance with step 17.
- When you finish the actions necessary to accomplish this, please inform me.

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 52.01 (Rev 15)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

TRANSFER THE SI SYSTEM TO THE COLD LEG RECIRCULATION MODE.

Applicability

RO/SRO

Est Completion Time **Actual Time**

_____

NUREG-1122 Importance Ratings

SYS/006/K4.08 (RO 3.2/SRO 3.6)
SYS/006/A2.02 (RO 3.9/SRO 4.3)
SYS/006/A3.08 (RO 4.2/SRO 4.3)
SYS/006/A4.01 (RO 4.1/SRO 3.9)
SYS/006/A4.02 (RO 4.0/SRO 3.8)
SYS/006/K3.02 (RO 4.3/SRO 4.4)

Surry Importance Rating

RO 3.92/SRO 4.22

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA has occurred on Unit 1. The RWST is near the RMT swapover point.

Standards

- 1-ES-1.3, Transfer to Cold Leg Recirculation, steps 1-4.

Initiating Cues

- 1-E-1, Loss of Reactor or Secondary Coolant, step 21b.
- Shift Supervisor direction.

Terminating Cues

- Completion of 1-ES-1.3, Transfer to Cold Leg Recirculation, steps 1-4.

Procedures

- 1-ES-1.3, Transfer to Cold Leg Recirculation.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- If no preset IC is available, this setup takes approximately 45 minutes.
- Call up 100% power IC and initialize. Place simulator in RUN.
- Initiate the following annunciator overrides:
  V1AE2_W to OFF.
- Initiate the following switch overrides:
  CSRMTA_REFUEL to ON,
  CSRMTB_REFUEL to ON.
- Initiate malfunction for A loop cold leg rupture (MRC0101).
- Perform E-0 & transition to 1-E-1. Perform 1-E-1 through step 21 which checks for transition to ES-1.3.
- Two (2) LHSI & two (2) HHSI pumps, two (2) ISRS should be running (no CS pumps should be running). HHSI pumps should be on redundant flowpath alignment and charging mini-flow recirc valves should be closed.
- When RWST level is ~15% (CSM101 of 6.0×10^5), freeze simulator for performance.

Performance Checklist

Directions to the Operator.

- I am the Shift Supervisor. A Large-Break LOCA has occurred on Unit 1. RWST level is near the RMT swapover point. The 1B LHSI pump is tagged and disassembled.
- Here's a copy of 1-ES-1.3, Transfer to Cold Leg Recirculation. I need you to transfer the SI system to the cold leg recirculation mode IAW steps 1-4.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 9 & 10 before 13; 13 before 14 & 15.
- **START TIME:** _____

1.REVIEW CAUTIONS & NOTE PRIOR TO STEP 1.

Standards

(a) Notes that SI recirc flow to RCS must be maintained at all times.
(b) Notes that transfer to recirculation may cause high radiation in the Auxiliary Building.
(c) Notes that steps 1 through 4 should be performed without delay and FRs should not be implemented before completion of these steps.

Evaluator's Comments

---

2. RESET SAFETY INJECTION.

Standards

Depresses both SI Reset pushbuttons on benchboard 1-1.

Evaluator's Note

If SI previously reset, verification of SI reset will suffice.

Evaluator's Comments

3. CHECK SW FLOW ESTABLISHED TO AT LEAST TWO RSHXs.

Standards

Checks the following flow indications for SW flow to at least two RS HXs:
(a) 1-SW-FI-106A (SW flow to "A" RSHX).
(b) 1-SW-FI-106B (SW flow to "B" RSHX).
(c) 1-SW-FI-106C (SW flow to "C" RSHX).
(d) 1-SW-FI-106D (SW flow to "D" RSHX).

Evaluator's Comments

---

4. VERIFY AC EMERGENCY BUSES - ENERGIZED BY OFFSITE POWER.

Standards

(a) Checks "H" bus voltage indicated (between 4000 and 4400 volts).
(b) Checks "H" bus normal supply breaker, 15H8, closed (red light on & green off).
(c) Checks "J" bus voltage indicated (between 4000 and 4400 volts).
(d) Checks "J" bus normal supply breaker, 15J8, closed (red light on & green off).

Evaluator's Comments

---

5. CHECK RS PUMPS ASSOCIATED WITH RS HXs SUPPLIED BY SW AT LEAST TWO RUNNING.

Standards

Checks if the following pumps are running (breaker indication red light on and amps indicated):
(a) 1-RS-P-1A (associated w/ A HX),
(b) 1-RS-P-1B (associated w/ B HX),

Evaluator's Comments

---

6. VERIFY LHSI PUMPS - BOTH RUNNING.

Standards

(a) Checks 1-SI-P-1A breaker indication red light on and amps indicated.
(b) Checks 1-SI-P-1B breaker indication red light on and amps indicated. not running, tagged

Evaluator's Comments

---

7. ALIGN SI SYSTEM FOR RECIRC.

Standards

(a) Notes CAUTION that if suction source is lost to any SI or CS pump, the pump should be stopped.
(b) Checks 1-CH-MOV-1275A closed by observing green light on and red light off.
(c) Checks 1-CH-MOV-1275B closed by observing green light on and red light off.
(d) Checks 1-CH-MOV-1275C closed by observing green light on and red light off.
(e) Checks RWST level less than 13% on the following indicators:
- 1-CS-LI-100A,
- 1-CS-LI-100B,
- 1-CS-LI-100C and/or
- 1-CS-LI-100D.

(f) If RWST level not less than 13%, waits for level to reach 13%.
(g) Verify Phase 1 - INITIATED
(h) LHSI discharge to HHSI - OPEN
- 1-SI-MOV-1863A
- 1-SI-MOV-1863B, tagged closed

(i) LHSI recirc valves - CLOSED
- 1-SI-MOV-1885A
- 1-SI-MOV-1885B
- 1-SI-MOV-1885C
- 1-SI-MOV-1885D

(j) *Verfiy Phase 2 - INITIATED
- Amber Phase 2 Status light on bench board - LIT
- LHSI suction from sump - OPEN
  i. *1-SI-MOV-1860A - **NOT OPEN (breaker indication NOT LIT)**
  ii. 1-SI-MOV-1860B - Tagged closed
- Attempts to manually open 1-SI-MOV-1860A without success

(k) *LHSI suction from the RWST - CLOSED
- *Verifies 1-SI-MOV-1862A **has remained open**
- Verifies 1-SI-MOV-1862B - Tagged closed
- ***Stops 1A LHSI pump**

(l) CHG pump suction from RWST valves - CLOSED
- 1-CH-MOV-1115B
- 1-CH-MOV-1115D

(m) *Reports to Shift Supervisor that LHSI remains in injection mode
(n) *Directs 1-SI-MOV-1860A to be opened locally. When 1-SI-MOV-1860A fully open, closes 1-SI-MOV-1862A.

Evaluator's Note

1-SI-MOV-1863A or 1-SI-MOV-1863B will provide sufficient head to the HHSI pumps, therefore only one needs to be performed.

For RO applicants, cue RO to make suggestion as to course of action for A train of LHSI. RO should recommend local manual alignment of 1-SI-MOV-1860A.

For SRO candidates, once alignment problem is identified, cue that they are now the SRO and that they must decide the course of action. They should then specify local manual alignment of 1-SI-MOV-1860A.

Evaluator's Comments

8. ACKNOWLEDGE "SI VALVE OUT OF POSITION" ANNUNCIATOR.

Standards
Acknowledges annunciator A-D-4 (SI VALVE OUT OF POSITION).

Evaluator's Comments

---

9. VERIFY RECIRCULATION FLOW ESTABLISHED.

Standards

Verifies SI flow to the Rx core via A cold leg flowpath by checking the following flow instrumentation:

- 1-SI-FI-1945 (A LHSI FT),
- 1-SI-FI-1946 (B LHSI FT),
- 1-SI-FI-1961 (A Loop FT),
- 1-SI-FI-1962 (B Loop FT),
- 1-SI-FI-1963 (C Loop FT),
- 1-SI-FI-1943 (Total flow normal hdr),
- 1-SI-FI-1943A (Total flow normal Hdr),
- 1-SI-FI-1940 (Total flow alt hdr),
- 1-SI-FI-1-940A (Total flow alt hdr).

Evaluator's Comments

---

10. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that cold leg recirculation established on A train.

Evaluator's Comments **STOP TIME:** _____

Evaluation Items

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. Following transfer to cold leg recirculation, 1-SI-MOV-1885D is bound in the open position and cannot be closed.

   Assuming 1-SI-MOV-1885A is known to leak by when closed, what potential problem does this condition present?

ANSWER

This results in potentially highly radioactive water being pumped into the RWST.

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
SYS/006/K4.08 RO3.2/SRO3.6	2 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED?
• 11448-FM-89A (sh 1&2)	YES
• NCRODP #52 (fig 52-3)	NO

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. Just prior to realigning the SI system for cold leg recirculation, the procedure directs reset of SI. Just before you attempt to reset SI for the transfer to cold leg recirculation, a spurious SI signal reinitiates SI.

   What effect does this have on your ability to reset SI? Briefly explain your answer.

ANSWER

SI cannot be reset immediately (0.4).
There is a 60 sec (0.20) time-delay (0.4) (before SI reset is allowed).

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	**EST TIME**	**ACTUAL TIME**
SYS/006/K4.11 RO3.9/SRO4.2	2 Min	_____

QUESTION REFERENCE	**REFERENCE ALLOWED?**
• NCRODP #52	NO
• ND-91-LP-2	NO

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 52.01 (Rev 15)
TRANSFER THE SI SYSTEM TO THE COLD LEG RECIRCULATION MODE

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **7 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

Licensed Operator Programs
FOLLOW UP QUESTION PERFORMANCE SUMMARY
Job Performance Measure 52.01 (Rev 15)
TRANSFER THE SI SYSTEM TO THE COLD LEG RECIRCULATION MODE

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

QUESTION #1: N/A _____ Fractional Score _____ Final Score: 1 / 0
(≥0.7 = 1 or <0.7 = 0)

Est Completion Time: **2 Min** Actual Completion Time: _____

Comments: _____

QUESTION #2: N/A _____ Fractional Score _____ Final Score: 1 / 0
(≥0.7 = 1 or <0.7 = 0)

Est Completion Time: **2 Min** Actual Completion Time: _____

Comments: _____

Evaluation Items

Question 2 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. Just prior to realigning the SI system for cold leg recirculation, the procedure directs reset of SI. Just before you attempt to reset SI for the transfer to cold leg recirculation, a spurious SI signal reinitiated SI.

   What effect does this have on your ability to reset SI? Briefly explain your answer.

Evaluation Items

Question 1 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. Following transfer to cold leg recirculation, 1-SI-MOV-1885D is bound in the open position and cannot be closed.

   Assuming 1-SI-MOV-1885A is known to leak by when closed, what potential problem does this condition present?

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA has occurred on Unit 1. The RWST is near the RMT swapover point.

Initiating Cues

- 1-E-1, Loss of Reactor or Secondary Coolant, step 21b.
- Shift Supervisor direction.

Directions

- I am the Shift Supervisor. A Large-Break LOCA has occurred on Unit 1. RWST level is near the RMT swapover point.
- Here's a copy of 1-ES-1.3, Transfer to Cold Leg Recirculation. I need you to transfer the SI system to the cold leg recirculation mode IAW steps 1-4.
- When you finish the actions necessary to accomplish this, please inform me.

b 1 c

RESPOND TO A VORTEXING RHR PUMP
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reasons for Revision	TIR Number(s)
01	0	07/24/92		
02	1	08/06/92	Enhanced simulator setup directions.	
03	2	03/01/93	AP-27.00, Rev. 4 changes.	
04	3	09/03/93	Rev. 7 formatting changes.	
05	4	08/22/94	AP-27.00 and OP-RC-005 changes.	S94-0825
06	5	07/25/96	KA# changes, procedure changes, and component label verification.	S96-0225
07	6	05/30/97	Att. 3 graph change in AP-27.00	S97-0509
08	7	03/20/98	Delete JPM # from trainee handouts.	S98-0286
09	8	12/09/98	Convert to Word.	S98-0936

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 40.05 (Rev 08)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

RESPOND TO A VORTEXING RHR PUMP.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	10 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
APE025.AA2.07 (RO 3.4/SRO 3.7) APE025.AA1.02 (RO 3.8/SRO 3.9) APE025.AA2.01 (RO 2.7/SRO 2.9)	RO 4.20/SRO 4.78

Conditions

- Task is to be SIMULATED in the plant or the simulator.
- Plant is at mid-loop on RHR cooling with 1-RH-P-1A in service on "A" RHR HX.
- RCS temperature is 105°F and pressure is atmospheric.

Standards

- 1-RH-P-1B running IAW 1-AP-27.00, Loss of Decay Heat Removal Capability.

Initiating Cues

- RHR Flow & pump motor amperage oscillations on 1-RH-P-1A.
- Shift Supervisor direction.

Terminating Cues

- 1-AP-27.00, Loss of Decay Heat Removal Capability, step 13 completed.

Procedures

- 1-AP-27.00, Loss of Decay Heat Removal Capability.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up RHR @ mid-loop IC and initialize.
- Ensure RED MAGNETS are setup properly on the following MOVS: RH-1700, RH-1701, RH-1720A & RH-1720B.
- Override RC-LI-100A at ~12.8 ft and RC-LR-105 at ~12 inches (12'10"), decrease actual level until pump begins to vortex.
- Initiate malfunction for cavitation of 1-RH-P-1A at 100% deg.
- Freeze simulator until JPM performance.
- Set RHR flow at 2500 gpm and place RH-FCV-1605 in AUTO.

Performance Checklist

Directions to the Operator.

- IF THIS TASK IS TO BE SIMULATED, THEN READ THE FOLLOWING: This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. RHR system flow is oscillating and we just received word from the Containment Watch, that the "A" RHR pump sounds like it is "vibrating".
- Here is a copy of 1-AP-27.00, Loss of Decay Heat Removal Capability. I need you to perform the necessary steps to respond to this event.
- When you complete AP-27.00, please inform me.

Notes to the Evaluator.

- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 5 before 10 before 11.
- **START TIME:** _____

---

1. READS CAUTIONS: LOSS OF RHR DUE TO TOTAL LOSS OF IA IS ADDRESSED BY AP-40.00, NON-RECOVERABLE LOSS OF IA; LOSS OF RHR MAY CAUSE CTMT RADIOLOGICAL AND HEAT STRESS CONDITIONS TO DEGRADE, AND THAT LOCAL ACTIONS IN CTMT SHOULD BE COORDINATED WITH HP; DURING SOLID PLANT OPERATION, INADVERTENT ACTUATION OF THE OPMS MAY OCCUR IF LETDOWN IS ISOLATED.

   Standards

   Reads caution and recognizes that total loss of IA is not occurring.

   CUES

   - **If asked:** Provide cue PI-IA-100, INST AIR, reads 105 psig.
   - **If asked:** Provide cue PI-SA-100, SERV AIR, reads 100 psig.
   - **If asked:** Provide cue PI-IA-101, CTMT INST AIR, reads 100 psig.
   - **If asked:** Provide cue Annunc B-E-6, IA LO HDR PRESS/IA COMPR 1 TRBL, is NOT lit.
   - **If asked:** Provide cue Annunc B-E-5, SERV AIR COMPR TRBL, is NOT lit.
   - **If asked:** Provide cue Annunc B-F-6, CTMT INST AIR HDR LO PRESS, is NOT lit.
   - **If asked:** Provide cue Annunc B-F-5, CTMT INST AIR COMPR TRBL, is NOT lit.

   Evaluator's Comments

---

2. CHECK RCS INVENTORY - DECREASING.

Standards

(a) Checks standpipe level (1-RC-LI-100A) stable and not decreasing.
(b) Checks loop narrow range level recorder (1-RC-LR-105) reading and trace are stable and not decreasing.
(c) Checks containment sump level (1-DA-LI-100) is stable and not increasing.
(d) Checks PRT conditions (level, LI-1-470; pressure, PI-1-472; and temperature, TI-1-471) are stable and not increasing.
(e) Checks PDTT level (1-DG-LI-107) is stable and not increasing.
(f) Determines that RCS inventory is NOT decreasing and transitions to procedure STEP 4.

CUES

- **If asked**: Provide cue Pzr level is off-scale low.
- **If asked**: Provide cue Local standpipe level is reading 12' 10" & stable.
- **If asked**: Provide cue Rx head is on, cavity is not flooded up.
- **If asked**: Provide cue 1-RC-LI-100A is reading 12.8 ft & stable.
- **If asked**: Provide cue 1-RC-LR-105 is reading 12'10" & stable.
- **If asked**: Provide cue CTMT SUMP indicates 50% on DA-LI-100, <5" on DA-LI-110A & -110B, and 0% with steady trend on L-DA110B (Aux vent pnl).
- **If asked**: Provide cue PRT level is 70% & stable (LI-1-470); PRT pressure is 3 psig & stable (PI-1-472); PRT temperature is 90°F & stable (TI-1-471).
- **If asked**: Provide cue PDTT level is 30% & stable (LI-DG-107).

Evaluator's Comments

---

3. VERIFY RHR PUMP - ONE RUNNING.

Standards

(a) Determines 1-RH-P-1A is running (by observing red breaker light lit and motor amps indicated).
(b) Determines 1-RH-P-1B not running (by observing green breaker light lit and no amps indicated).

CUES

- **If asked**: Provide cue 1-RH-P-1A has red bkr light lit & amps randomly spiking between 30 & 40 amps.
- **If asked**: Provide cue 1-RH-P-1B has green bkr light lit & 0 amps indicated.
- **If asked**: Provide cue RH-FI-1605 flow randomly spiking between 2000 & 3000 gpm.
- **If asked**: Provide cue Operator in Ctmt says RH-P-1A is vibrating.

Evaluator's Comments

4. VERIFY RHR FLOW - INDICATED ON 1-RH-FI-1605.

Standards

Checks 1-RH-FI-1605 shows RHR system flow.

CUES

- **If asked:** Provide cue RH-FI-1605 flow randomly fluctuating between 2000 & 3000 gpm.
- **If asked:** Provide cue ERFCS reading of RHR flow fluctuating between 2050 & 3025 gpm.

Evaluator's Comments

---

* 5. CHECK RHR PUMP - VORTEXING.

Standards

Determines 1-RH-P-1A is vortexing by either:
- Checking 1-RH-FI-1605 for oscillating RHR system flow, or
- Checking 1-RH-P-1A amp indication for oscillating amperage.

CUES

- **If asked:** Provide cue RH-FI-1605 flow randomly spiking between 2000 and 3000 gpm.
- **If asked:** Provide cue ERFCS reading of RHR flow fluctuating between 2050 & 3025 gpm.
- **If asked:** Provide cue RH-P-1A amps randomly spiking between 30 and 40 amps.
- **If asked:** Provide cue Operator in Ctmt says RH-P-1A is vibrating.

Evaluator's Comments

---

6. REDUCE RHR FLOW TO ATTEMPT TO STOP VORTEXING.

Standards

(a) Acknowledges CAUTION prior to procedure step 7 that RHR flow less than required by attachment 1 may cause RCS temp to increase.
(b) Places FCV-1605 controller to MANUAL by momentarily depressing the MAN pushbutton.
(c) Pushes the decrease pushbutton to decrease valve demand position until RHR flow decreases.

CUES

- **If asked**: Provide cue time after shutdown is 230 hours.
- **If asked**: Provide cue SS recommends not decreasing flow < 1500 gpm.
- **If asked**: Provide cue initial demand on HCV-1758 controller at 98%. Indicates 100% if fully closed.
- **If asked**: Provide cue FCV-1605 controller initially in AUTO; when MAN pushbutton pressed, controller swaps to MANUAL.
- **If asked**: Provide cue initial demand on FCV-1605 controller at ~50% in AUTO.
- **If asked**: Provide cue prior to reducing FCV-1605 demand, RH-FI-1605 flow randomly spiking between 2000 and 3000 gpm.
- **If asked**: Provide cue after reducing FCV-1605 demand, RH-FI-1605 flow randomly spiking between 1800 and 2200 gpm.
- **If asked**: Provide cue ERFCS reading of RHR flow fluctuating between 1700 & 2100 gpm.
- **If asked**: Provide cue RHR flow and pump motor amps will continue to spike.

NOTE: If performed on the simulator and flow is taken low enough, indications of vortexing may stop. If this occurs, inform the operator that the pump is still vortexing.

Evaluator's Comments

---

7. CHECK RHR PUMP - STILL VORTEXING.

Standards

Determines 1-RH-P-1A is still vortexing by either:
- Checking 1-RH-FI-1605 for oscillating RHR system flow, or
- Checking 1-RH-P-1A amp indication for oscillating amperage.

CUES

- **If asked**: Provide cue RH-FI-1605 flow randomly spiking between 1500 and 2000 gpm.

B **If asked**: Provide cue ERFCS reading of RHR flow fluctuating between 900 & 1480 gpm.

- **If asked**: Provide cue RH-P-1A amps randomly spiking between 30 and 35 amps.
- **If asked**: Provide cue Operator in Ctmt says RH-P-1A is vibrating.

Evaluator's Comments

---

8. CHECK ADEQUATE RCS LEVEL.

Standards

(a) Determines current RHR system flow to be 2250 gpm.
(b) Determines minimum RCS level for current flow by:
- Locating current RHR flow rate on X-axis (Att 2 or 3).
- Following line up until it intersects with heavy line.
- Following intersect point to the left until the Y-axis is reached.
- Reads minimum RCS level from Y-axis.

(c) Determines that adequate RCS level to support current RHR flow exists by either:
- Comparing 1-RC-LI-100A to MIN required (12.41') from Att 2 -OR-
- Comparing 1-RC-LR-105 to MIN required (7.75") from Att 3.

CUES

- **If asked**: Provide cue 1-RC-LI-100A is reading 12.8 ft & stable.
- **If asked**: Provide cue 1-RC-LR-105 is reading 12 inches (12'10") & stable.
- **If asked**: Provide cue Local standpipe level is reading 12' 10" & stable.

Evaluator's Comments

---

9. VERIFY RHR PUMPS - BOTH AVAILABLE.

Standards

(a) Determines 1-RH-P-1A is available (by observing red breaker light on and motor amps indicated).
(b) Determines 1-RH-P-1B is available (by observing green breaker light lit and no amps indicated).

CUES

- **If asked**: Provide cue 1-RH-P-1A has red bkr light lit & amps randomly spiking between 30 & 35 amps.
- **If asked**: Provide cue 1-RH-P-1B has green bkr light lit & 0 amps indicated.
- **If asked**: Provide cue SS knows of no problems associated with running RH-P-1B.

Evaluator's Comments

---

* 10. SECURE VORTEXING RHR PUMP (PROCEDURE STEPS 11a, b and c).

Standards

*(a) Secures 1-RH-P-1A by placing pump control switch in either the STOP or PTL position.
(b) Checks no RHR flow is indicated by observing 1-RH-FI-1605 at 0 gpm.
(c) Closes 1-RH-HCV-1758, by turning control pot clockwise to increase demand position until the demand indicates full closed.
*(d) Pushes the 1-RH-FCV-1605 controller decrease pushbutton to decrease valve demand position until the demand indicates full closed.

CUES

- **If asked**: Provide cue after securing pump, RH-FI-1605 flow indicates 0.
- **If asked**: Provide cue ERFCS reading of RHR flow at 0 gpm.
- **If asked**: Provide cue after securing pump, RH-P-1A amp meter indicates 0.
- **If asked**: Provide cue after securing pump, RH-P-1A has green bkr light lit.
- **If asked**: Provide cue initial demand on HCV-1758 controller at 98%; indicates 100% when properly operated.
- **If asked**: Provide cue FCV-1605 controller initially in MANUAL.
- **If asked**: Provide cue initial demand on FCV-1605 controller at 20% in MAN; indicates 0% when properly operated.

SIMULATOR OPERATOR'S NOTE: When performed on the simulator and the RHR pump is secured, CH-305 should be set to 25% open prior to the second pump being started.

Evaluator's Comments

* 11. RESTORE RHR SYSTEM FLOW (PROCEDURE STEPS 11d and e).

Standards

*(a) Starts 1-RH-P-1B by placing control switch to the START position.
(b) Verifies 1-RH-P-1B amps indicated and breaker RED light lit.
(c) Re-opens 1-RH-HCV-1758, by turning control pot counter-clockwise to decrease demand position to ~98%.
*(d) Re-opens 1-RH-FCV-1605 by pushing the controller increase pushbutton to increase valve demand position and RHR flow.
(e) Returns 1-RH-FCV-1605 controller to AUTO.
(f) Checks RHR flow stable at ~2500 gpm as indicated on 1-RH-FI-1605.

CUES

- **If asked**: Provide cue prior to start RH-P-1B bkr lights are GREEN on & RED off. Following proper start, RED light is on & GREEN is off.
- **If asked**: Provide cue 1-RH-P-1B amp meter indicates 25 amps (no load).
- **If asked**: Provide cue initial demand on HCV-1758 controller at 100%; indicates 98% when properly operated.
- **If asked**: Provide cue initial demand on FCV-1605 controller at 0% in MAN; indicates ~50% when properly operated.
- **If asked**: Provide cue RH-FI-1605 indicates 0 gpm prior to reopening valves.
- **If asked**: Provide cue RH-FI-1605 indicates 1000 gpm just after beginning to re-open valves.
- **If asked**: Provide cue RH-FI-1605 indicates ~2500 gpm & stable just after FCV-1605 restored to ~50% demand.
- **If asked**: Provide cue after FCV-1605 returned to AUTO, RHR flow stable at ~2500 gpm.
- **If asked**: Provide cue ERFCS reading of RHR flow stable at ~2500 gpm.
- **If asked**: Provide cue RHR amps increase and are stable after returning 1605 and 1758 to their pre-evolution positions.

Evaluator's Comments

12. CHECK RHR HEAT SINK.

Standards

(a) Checks RHR system flow on 1-RH-FI-1605.
(b) Checks RHR HX CC outlet header flow by observing 1-CC-FI-110A.
(c) Checks RHR CC outlet header temperature by observing 1-CC-TI-109A.

CUES

- **If asked:** Provide cue 1-RH-FI-1605 stable at 2500 gpm.
- **If asked:** Provide cue ERFCS reading of RHR flow stable at ~2500 gpm.
- **If asked:** Provide cue 1-CC-FI-110A indicates 40 x 100 gpm.
- **If asked:** Provide cue 1-CC-FI-110B indicates 25 x 100 gpm.
- **If asked:** Provide cue 1-CC-TV-109A indicates red light on & green light off.
- **If asked:** Provide cue 1-CC-TV-109B indicates red light on & green light off.
- **If asked:** Provide cue 1-CC-TI-109A indicates 92°F.
- **If asked:** Provide cue 1-CC-TI-109B indicates 82°F.

Evaluator's Comments

---

13. VERIFY RCS TEMPERATURE - STABLE OR DECREASING.

Standards

(a) Checks Core Exit Thermocouples temperatures reading stable or decreasing.
(b) Checks RHR pump discharge temperature recorder (1-RH-TR-1604 RED PEN) stable or decreasing.
(c) If temperature increasing, then adjusts 1-RH-HCV-1758 control pot to decrease demand and increase flow through heat exchanger.
(d) Checks RHR HX outlet temperature recorder (1-RH-TR-1604 GREEN PEN) stable or decreasing.

CUES

- **If asked:** Provide cue CETCs indicate 105°F & stable.
- **If asked:** Provide cue RH-TR-1604 RED PEN (pp disch) indicates 106°F & stable.
- **If asked:** Provide cue RH-TR-1604 GREEN PEN indicates 105°F & stable.

Evaluator's Comments

---

14. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that AP-27.00 completed & RHR cooling restored.

Evaluator's Comments **STOP TIME:** _____

B 1 f

RESPOND TO #3 EDG FAILURE TO LOAD
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	09/16/91		
02	1	09/18/91	Enhanced cues and time validation.	
03	2	07/16/92	Editorial/formatting changes.	
04	3	07/07/93	Procedure revision.	S93-0851
05	4	08/02/94	Procedure revisions.	S94-0853
06	5	08/15/95	Correct annunciator titles, annunciator locations, and question references.	S95-0719
07	6	11/18/96	KA number and procedure changes.	S96-0260
08	7	04/18/87	Correct cues for actual condition where EDG 3 loads are bus.	S97-0348
09	8	03/24/98	Delete JPM # from trainee handouts.	S98-0286
10	9	12/09/98	Convert to Word.	S98-0936

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 55.06 (Rev 09)

Performed by _____ Questions by _____

Evaluator _____ Evaluation Date _____

Task

RESPOND TO #3 EDG FAILURE TO LOAD.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	15 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
SYS064.A4.06 (RO 3.9/SRO 3.9)	RO 4.00/SRO 3.44

Conditions

- Task is to be Performed in the Simulator.
- A LOOP has occurred from 100% power. A unit trip W/ no SI has occurred.
- #1 EDG has properly loaded. However, #3 EDG has experienced a failure to auto-load, thereby leaving 1J bus deenergized.

Standards

- #3 EDG loaded on 1J bus (15J3 closed) IAW AP-17.05, EDG 3 EMERGENCY OPERATIONS.

Initiating Cues

- 1-AP-10.07, Loss of Unit 1 Power, step 2 RNO.
- Shift Supervisor direction.

Terminating Cues

- Report received that #3 EDG loaded on 1J bus and AP-17.05 completed.

Procedures

- AP-17.05, EDG 3 - EMERGENCY OPERATIONS.

Tools and Equipment

- None

Safety Considerations

- None

Performance Checklist

Simulator Setup:

- Recall IC#1 and enter malfunctions MEL01 1 sec TD, Loss Of Offsite Power, and MEL1002 1 sec TD, Failure of #3 EDG to Load. Setup the simulator and place the simulator to run. Once the simulator is stable, make the malfunctions active and perform the immediate actions of E-0 and steps 1 and 2 of AP-10.07, wait about 10 minutes to allow the majority of the cooldown cycle on #3 EDG to expire, then freeze the simulator.

Directions to the Operator.

- I am the Shift Supervisor and you are the 3RD license. A loss of off-site power has occurred and the 1J bus is de-energized because #3 diesel failed to load. The #3 EDG has been stopped in accordance with AP-10.07.
- I need you to get a copy of AP-17.05 and load #3 EDG onto the 1J bus.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 5 then 14.
- **START TIME:** _____

---

1. OBTAIN COPY OF AP-17.05.

   Standards

   Goes to AP drawer (or AP book) and gets copy of AP-17.05.

   Evaluator's Comments

---

2. ACKNOWLEDGES CAUTIONS PRIOR TO STEP 1.

   Standards

   (a) Acknowledges CAUTION that an EDG should not run unloaded for more than ten minutes on a de-energized emergency bus.
   (b) If a running EDG has been stopped because the associated Emergency Bus is deenergized, the cooldown cycle should be completed before starting the EDG.
   (c) Acknowledges CAUTION that the SS should direct loading of EDG #3 to the 1J or 2J emergency bus to best support plant recovery.

   Evaluator's Comments

---

3. ASKS ELECTRICAL AND MECHANICAL DEPARTMENT TO PROVIDE ASSISTANCE.

Standards

Requests SS to obtain Electrical and Mechanical Department assistance.

CUES

- **If asked:** Maintenance Department has been dispatched.

Evaluator's Comments

---

4. CHECK EDG 3 - WILL BE ALIGNED TO UNIT 1.

Standards

Remembers instructions to load the EDG on 1J bus.

Evaluator's Comments

---

*5. COMMIT EDG # TO UNIT 1.

Standards

*(a) Has Unit 2 place the bypass switch on # 3 EDG in bypass.
*(b) Has Unit 2 place 25J3 in PTL.

CUES

- Once the operator has told Unit two to Place the bypass switch in bypass, then report it is in bypass.
- Once the operator has told Unit two to put 25J3 in PTL, then report 25J3 is in PTL.

SIMULATOR NOTE

- When the operator has requested the bypass switch, then use PEDS to put the bypass switch for Unit 2 #3 EDG in BYPASS.

Evaluator's Comments

---

6. ACKNOWLEDGES NOTE PRIOR TO STEP 4.

Standards

Acknowledges NOTE regarding the START FAILURE of the EDG.

Evaluator's Comments

---

7. CHECKS ANNUNCIATOR VSP-B-5, EMERG GEN 3 TRBL - NOT LIT.

Standards

Checks annunciator VSP-B-5 NOT lit.

Evaluator's Comments

---

8. VERIFIES AUXILIARY TRIP RELAY - RESET.

Standards

(a) Verifies AMBER light on Unit 1 EDG 3 control panel above EMERG GEN #3 TRIP AUX RESET BUTTON is lit and goes to RNO.
(b) Goes to Attachment 1.

Evaluator's Comments

---

9. READS NOTES PRIOR TO STEP 1.

Standards

Reads notes about auxiliary trip relay and remembers the EDG was manually stopped.

Evaluator's Comments

---

10. STRIPS LOADS IAW ATTACHMENT 3.

Standards

(a) Verifies 1J bus deenergized by noting 15J8 and 15J3 are open and there is no voltage on the bus.
(b) Goes to attachment 3 to strip loads.
(c) Places following in PTL.
1-SI-P-1B(14J3)
1-CS-P-1B(14J5)
1-RS-P-1B(14J4)
1-RS-P-2B(14J8)
1-VS-F-1B(14J7)
PRZR Heater Group A(14J9)
1-CH-P-1B(15J5)
1-CH-P-1C(15J2, ALT)
1-FW-P-3B(15J4)
(d) Verifies 15J8, 1J Bus normal supply breaker, OPEN
(e) Verifies 15J9, 1J Stub bus open by dispatching operator to breaker.

AFTER OPERATOR IS DISPATCHED THEN TELL OPERATOR 15J9 IS OPEN ALSO BOOTH OPERATOR SHOULD CALL AND REPORT REPAIRS HAVE BEEN MADE TO EDG THE BOOTH OPERATOR SHOULD CLEAR THE EDG MALFUNCTION PROVIDED EDG RPM=0

Evaluator's Comments

---

11. RETURNS TO ATTACHMENT 1 AND READS NOTE PRIOR TO STEP 2.

Standards

Reads note about differential fault.

Evaluator's Comments

---

12. CHECKS FOR CAUSE OF AUXILIARY TRIP RELAY ACTUATION.

Standards

(a) Remembers the EDG was manually stopped.
(b) When the cooldown cycle is complete, then pushes the EMERG GEN #3 TRIP AUX RESET pushbutton at the Unit 1 EMERG GEN NO 3 CONTROL panel.
(c) Returns to procedure step 6.

Evaluator's Comments

---

13. CHECKS EDG RUNNING

Standards

(a) Confirms engine is not running by checking engine RPM at zero.
(b) Goes to RNO.
(c) Goes to attachment 2.

Evaluator's Comments

---

*14. PERFORMS ATTACHMENT 2.

Standards

(a) Notes AUTO-EXERCISE EMERG GEN 3 switch is in EXERCISE.
(b) Notes 1J bus is deenergized and attachment 3 previously performed.
*(c) Presses EMERG GEN NO. 3 ENGINE START pushbutton.
(d) Notes # 3 EDG is running by verifying RPMS.
(e) Verifies # 3 EDG RPM at 900.
*(f) Places AUTO-EXERCISE EMERG GEN 3 to AUTO.
(g) Returns to procedure step 8.

Evaluator's Comments

---

15. CHECKS BOTH J BUSES - ENERGIZED BY OFF-SITE POWER.

Standards

(a) Verifies 1J bus not energized by off-site power by observing 15J8 breaker OPEN (GREEN light lit, RED light out).
(b) Checks 2J bus deenergized by asking Unit 2 operator or SS.
(c) Transitions to step 10.

CUES

- **If asked:** 15J8 breaker - GREEN light lit, RED light out.

Evaluator's Comments

---

16. ACKNOWLEDGES NOTE PRIOR TO STEP 10.

Standards

(a) Acknowledges NOTE that if DC Bus deenergized, EDG output breaker and J Bus load breakers must be closed manually.
(b) Acknowledges NOTE that the following conditions must exist for the EDG output breaker to close automatically:
. EDG speed > 870 rpm,
. EDG incoming voltage > 113 volts,
. J8 breaker open,
. Control switch for the J3 breaker in AUTO AFTER TRIP,
. DC Control power available to the J3 breaker.

Evaluator's Comments

---

17. CHECKS EDG - SUPPLYING J BUS.

Standards

(a) Verifies #3 EDG output breaker (ACB-15J3) CLOSED (red light ON).
(b) Verifies VOLTAGE indicated on J bus volt meter.

Evaluator's Comments

---

18. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that EDG 3 has been loaded onto the 1J bus.

Evaluator's Comments **STOP TIME:** _____

---

15 1 a

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 67.01 (Rev 08)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

PERFORM CLS COMPONENT VERIFICATION (E-0, ATTACHMENT 1).

Applicability

RO/SRO

Est Completion Time

Actual Time

_____

NUREG-1122 Importance Ratings

EPE011.EA1.07 (RO 4.4/SRO 4.4)
SYS022.A3.01 (RO 4.1/SRO 4.3)
SYS022.A4.01 (RO 3.6/SRO 3.6)
SYS026.A3.01 (RO 4.3/SRO 4.5)
SYS026.A4.01 (RO 4.5/SRO 4.3)
SYS026.A3.01 RO 3.9/SRO 4.2)

Surry Importance Rating

RO 4.07/SRO 3.56

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA is in progress with containment pressure > 23.0 psia.

Standards

- E-0, Reactor Trip or Safety Injection, Attachment 1.

Initiating Cues

- E-0, Reactor Trip or Safety Injection, step 12g.
- Shift Supervisor direction to perform E-0, Attachment 1.

Terminating Cues

- Verbal report made of E-0, Attachment 1 completion.

Procedures

- E-0, Reactor Trip or Safety Injection, Attachment 1.

Tools and Equipment

- None

Safety Considerations

- None

Simulator Setup

- Call up 100% power IC and initialize.
- Enter the malfunction for "A" RC loop cold leg rupture (MRC0101) with 1 sec TD.
- Implement the following SIMLOCH variable: DISA_CC140A_ACL for 1-CC-TV-140A = T.
- Implement the following SIMLOCH variable: DISA_RS156_AOPEN for 1-RS-MOV-156A = T.
- Start malfunction timer, trip RCPs and perform E-0 up to step 12f.
- Freeze simulator until ready to perform JPM.

Performance Checklist

Directions to the Operator.

- I am the Shift Supervisor. A large break LOCA has occurred on Unit 1. Containment pressure is above 23 psia.
- Here is a copy of E-0 Attachment 1. I need you to perform the CLS COMPONENT VERIFICATION.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: None.
- **START TIME:** _____

---

* 1. VERIFY CONTAINMENT ISOLATION TRIP VALVES CLOSED.

Standards

Checks trip valve area of Vertical Board 1 and verifies the following trip valves are closed (green light on & red off):

(a) 1-RM-TV-100C.
(b) 1-RM-TV-100B.
(c) 1-RM-TV-100A.
(d) 1-CC-TV-105A.
(e) 1-CC-TV-105B.
(f) 1-CC-TV-105C.
*(g) Notes 1-CC-TV-140A not closed. Pushes close button and verifies that green light comes on.
(h) 1-CC-TV-140B.
(i) 1-SV-TV-102.
(j) 1-CC-TV-110A.
(k) 1-CC-TV-110B.
(l) 1-IA-TV-101A.
(m) 1-CC-TV-110C.
(n) 1-IA-TV-100.
(o) 1-IA-TV-101B.

Evaluator's Comments

---

* 2. VERIFY CONTAINMENT AIR RECIRC FANS TRIPPED.

Standards

Checks Unit 1 Vent panel to verify the following fans are tripped (amber light lit):
*(a) 1-VS-F-1A (Not tripped)
(b) 1-VS-F-1B
(c) * Takes action XXX to ensure 1-VS-F-1A is tripped locally.)

Evaluator's Comments

---

3. VERIFY RECIRC SPRAY SERVICE WATER RADIATION MONITOR PUMPS RUNNING.

Standards

Checks Unit 1 Radiation Monitoring Panel to verify the following pumps are running (Red light on Green light off):
(a) 1-SW-P-5A
(b) 1-SW-P-5B
(c) 1-SW-P-5C
(d) 1-SW-P-5D

Evaluator's Comments

---

4. VERIFY RS SW RADIATION MONITOR PUMP LOW FLOW ALARMS CLEAR.

Standards

Checks Unit 1 RIS Panel on Vertical Board 1 to verify the following alarms are clear:
(a) A-D-6, RS HX 1A RAD MON PP NO FLOW
(b) A-E-6, RS HX 1B RAD MON PP NO FLOW
(c) A-F-6, RS HX 1C RAD MON PP NO FLOW
(d) A-G-6, RS HX 1D RAD MON PP NO FLOW

Evaluator's Comments

---

* 5. VERIFY CS AND RS VALVE ALIGNMENTS.

Standards

Checks the CS/RS section of Benchboard 1-1 and verifies the following valves are open (red light on & green off):

(a) 1-CS-MOV-102A, Caustic Tank Outlet isolation.
(b) 1-CS-MOV-102B, Caustic Tank Outlet isolation.
*(c) 1-RS-MOV-156A, ORS Pump Discharge isolation.
(d) 1-RS-MOV-156B, ORS Pump Discharge isolation.
(e) 1-RS-MOV-155A, ORS Pump Suction isolation.
(f) 1-RS-MOV-155B, ORS Pump Suction isolation.
(g) 1-CS-MOV-101B, CS Pump Discharge isolation.
(h) 1-CS-MOV-101A, CS Pump Discharge isolation.
(i) 1-CS-MOV-101D, CS Pump Discharge isolation.
(j) 1-CS-MOV-101C, CS Pump Discharge isolation.
(k) 1-CS-MOV-100A, CS Pump Suction isolation.
(l) 1-CS-MOV-100B, CS Pump Suction isolation.

Evaluator's Comments

---

6. VERIFY RS HX SERVICE WATER VALVE ALIGNMENT.

Standards

Checks the CW/SW section of Benchboard 1-1 and verifies the following valves are open (red light lit):

(a) 1-SW-MOV-105A
(b) 1-SW-MOV-105B
(c) 1-SW-MOV-105C
(d) 1-SW-MOV-105D
(e) 1-SW-MOV-104A
(f) 1-SW-MOV-104B
(g) 1-SW-MOV-104C
(h) 1-SW-MOV-104D
(i) 1-SW-MOV-103A
(j) 1-SW-MOV-103B
(k) 1-SW-MOV-103C
(l) 1-SW-MOV-103D

Evaluator's Comments

---

7. VERIFY SW OUTLET FLOW FROM RSHXs BETWEEN 6,000 GPM AND 12,500 GPM.

Standards

Checks the RSHX SW flow indicators in Vertical Board 1 to verify flow between 6,000 gpm and 12,500 gpm on:
(a) 1-SW-FI-106A, RS HX A
(b) 1-SW-FI-106B, RS HX B
(c) 1-SW-FI-106C, RS HX C
(d) 1-SW-FI-106D, RS HX D

Evaluator's Comments

---

8. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made of task completion.

Evaluator's Comments **STOP TIME:** _____

RETRIEVE ATTACHMENT ONE FROM OPERATOR PRIOR TO BEGINNING QUESTIONS.

Evaluation Items

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. Assume that TV-CC-140A failed to go closed when the close pushbutton was depressed because the valve was physically bound in open position.

   What action would you take in response to this condition?

ANSWER

Verify TV-CC-140B was closed.

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
APE069.AA2.01 RO3.7/SRO4.3	2 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED?
FM-72A, Sheet 1 of 7	NO

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. Assume that the "A" Containment Air Recirc Fan did not trip when HI-HI CLS initiated and the "H" Emergency Bus voltage has remained at 4200 volts (powered from RSS).

   What action would you take in response to this condition? Briefly explain your answer.

ANSWER

Manually secure the fan. (0.5)

This was an automatic action from HI-HI CLS which did not occur therefore it should be manually performed. (0.5)

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
SYS022.A3.01 RO4.1/SRO4.3 GEN2.1.32 RO3.2/SRO3.4	2 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED?
E-0, Attachment 1	NO

Evaluator's Summary

Job Performance Measure 67.01 (Rev 08)

PERFORM CLS COMPONENT VERIFICATION (E-0, ATTACHMENT 1)

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 67.01 (Rev 08)
PERFORM CLS COMPONENT VERIFICATION (E-0 ATTACHMENT 1)

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **3 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☒

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

Licensed Operator Programs
FOLLOW UP QUESTION PERFORMANCE SUMMARY
Job Performance Measure 67.01 (Rev 08)
PERFORM CLS COMPONENT VERIFICATION (E-0 ATTACHMENT 1)

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

QUESTION #1: N/A _____ Fractional Score _____ Final Score: 1 / 0
($\geq$0.7 = 1 or <0.7 = 0)

Est Completion Time: **2 Min** Actual Completion Time: _____

Comments: _____

QUESTION #2: N/A _____ Fractional Score _____ Final Score: 1 / 0
($\geq$0.7 = 1 or <0.7 = 0)

Est Completion Time: **2 Min** Actual Completion Time: _____

Comments: _____

Evaluation Items
Question 2 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. Assume that the "A" Containment Air Recirc Fan did not trip when HI-HI CLS initiated and the "H" Emergency Bus voltage has remained at 4200 volts (powered from RSS).

   What action(s) would you take in response to this condition? Briefly explain your answer.

Evaluation Items

Question 1 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. Assume that TV-CC-140A failed to go closed when the close pushbutton was depressed because the valve was physically bound in open position.

   What action would you take in response to this condition?

Conditions

- Task is to be PERFORMED in the simulator.
- A LBLOCA is in progress with containment pressure > 23.0 psia.

Initiating Cues

- E-0, Reactor Trip or Safety Injection, step 12g.
- Shift Supervisor direction to perform E-0, Attachment 1.

Directions

- I am the Shift Supervisor. A large break LOCA has occurred on Unit 1. Containment pressure is above 23 psia.
- Here is a copy of E-0 Attachment 1. I need you to perform the CLS COMPONENT VERIFICATION.
- When you finish the actions necessary to accomplish this, please inform me.

B 2 ~

CROSS-TIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2) DOCUMENT REVISION RECORD				
Dist. No.	**Rev. No.**	**Date Issued**	**Reason for Revision**	**TIR Number(s)**
01	0	09/23/90		
02	1	09/17/91	Procedure revision. Enhanced cues and clarification of step 6 that both 1J1-2E & 2W must both be stripped.	
03	2	07/27/92	Editorial/formatting changes.	
04	3	05/28/93	Emergency Procedure revision. Corrected cues for attempts at local closure.	S93-0598
05	4	09/08/93	Rev. 7 formatting changes.	
06	5	09/21/93	Reflect ECA-0.1, Attachment 1 Rev. 7 changes to cue.	S93-0850
07	6	08/22/94	Reflect local pistol grip out of closing circuit when 15H1/25H1 racked to connect.	S94-0808
08	7	11/15/94	Current revision of ECA-0.1 and FCA-12.00.	S94-1052
09	8	08/09/96	KA number and procedure changes; component label verification.	S96-0207
10	9	03/23/98	Delete JPM # from trainee handouts.	S98-0286
11	10	12/09/98	Convert to Word.	S98-0936
12	11	01/11/99	Update for Rev. 10 of ECA-0.1.	S98-0975
13	12	09/14/99	1999 Op Eval.	S99-0555
14	13	01/11/00	Rev 11, ECA-0.1	S99-0875

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 35.03 (Rev 13)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

CROSS-TIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2).

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	15 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
APE056.AA1.02 (RO 3.8/SRO 4.1)	NLO

Conditions

- Task is to be SIMULATED in the plant.
- A simulated loss of all on- and off-site power (blackout) has previously occurred on Unit 1. The #1 EDG has been restored and bus 1H is energized (1J & 2J buses are dead). ECA-0.1 is in progress at step 3 to establish IA.

Standards

- 1-ECA-0.1, Attachment 2.

Initiating Cues

- 1-ECA-0.1, Attachment 1, step 3.
- Shift Supervisor direction.

Terminating Cues

- Completion of attachment 2, part 2, step 6.

Procedures

- 1-ECA-0.1, Loss of All AC Power Recovery Without SI Required, Attachment 2.

Tools and Equipment

- Breaker racking tool

Safety Considerations

- Standard Personal Safety Equipment

Performance Checklist

Directions to the Operator.

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. We are recovering from a loss of all AC power. Currently, both 1H and 2H emergency buses are energized, however, both unit J buses are deenergized.
- Here is 1-ECA-0.1, Attachment 2. I need you to cross-tie Unit 1 emergency buses by performing all of Part 1 and Part 2 through step 6.
- When you finish the actions necessary to accomplish this, please inform me so that the Turbine Building Operator can line up fire water cooling and start the IA compressor.

Notes to the Evaluator.

- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 1, 4, 7, 8, and 11 before 13.
- **START TIME:** _____

---

* 1. LOCKOUT THE 1J BUS EQUIPMENT POSSIBLE FROM THE MAIN CONTROL ROOM.

Standards

Places the following controls in the PTL (or lockout) position:

*(a) 1-VS-F-58B
*(b) 1-FW-P-3B
(c) 1-CH-P-1C (Alternate supply)
*(d) 1-CH-P-1B
*(e) Unit 1 PRZR heater group "A"
*(f) 1-CS-P-1B
*(g) 1-RS-P-2B
*(h) 1-RS-P-1B
*(i) 1-SI-P-1B
*(j) 15J3 (#3 EDG supply to Unit 1)
*(k) 1-VS-F-1B
(l) 15H1 (Bus Tie)

CUES

- **If asked:** The power supply indicator for 1-VS-F-58B indicates it is powered from the 2H bus.

Evaluator's Note

- 1-VS-F-58B normal power supply is from 2H - this substep is only critical if 1-VS-F-58B is powered from its alternate power supply.
- 1-CH-P-1C (ALT) and breaker 15H1 are normally maintained in PTL.

Evaluator's Comments

---

2. LOCALLY VERIFY THE "B" CONTAINMENT SPRAY PUMP BREAKER (1-CS-P-1B) OPEN.

Standards

(a) Proceeds to 480v breaker 14J-5.
(b) Verifies breaker indicates OPEN by observing the breaker mechanical indicating flag.

CUES

- **If asked**: 14J-5 breaker mechanical indicator flag shows OPEN.

Evaluator's Comments

---

3. LOCALLY VERIFY THE "B" RECIRC SPRAY PUMP BREAKER (1-RS-P-1B) OPEN.

Standards

(a) Proceeds to 480v breaker 14J-4.
(b) Verifies breaker indicates OPEN by observing the breaker mechanical indicating flag.

CUES

- **If asked**: 14J-4 breaker mechanical indicator flag shows OPEN.

Evaluator's Comments

---

* 4. LOCALLY OPEN THE SUPPLY BREAKER FOR MCC 1J1-1.

Standards

Proceeds to 480v breaker 14J1-6 (MCC 1J1-1 FDR BKR) and opens the breaker by depressing the breaker TRIP pushbutton.

CUES

- **If asked**: Breaker mechanical indicator flag shows CLOSED before trip.
- **Tell operator**: (When breaker trip button pressed), a "bang" breaker operating noise is heard.
- **If asked**: Breaker mechanical indicator flag shows OPEN following trip.

Evaluator's Comments

---

5. LOCALLY VERIFY 1-FW-P-3B BREAKER OPEN.

Standards

(a) Proceeds to 4160V breaker 15J4.
(b) Verifies breaker 15J4 indicates open by observing breaker indicating lights and/or breaker mechanical indicator flag.

Evaluator's Cues

- **If asked:** Bkr mechanical indicator flag shows OPEN.
- **If asked:** Bkr mechanical indicating lights show green and amber lights lit and red light off.

Evaluator's Comments

---

6. LOCALLY VERIFY 1J BUS STUB BUS SEPARATED.

Standards

(a) Proceeds to Unit 1 Emergency Switchgear Room 4160v breaker 15J9.
(b) Verifies breaker 15J9 indicates OPEN by observing breaker indicating lights and/or breaker mechanical indicator flag.

CUES

- **If asked:** 15J9 breaker mechanical indicator flag shows OPEN.
- **If asked:** 15J9 breaker indicating lights show green and amber lights lit and red light off.

Evaluator's Comments

---

* 7. LOCALLY OPEN ALL BREAKERS ON MCC 1J1-2.

Standards

(a) Proceeds to MCC 1J1-2 (Unit 1 Cable Vault).
(b) Records on attachment 1, all breakers found open or tagged-open on MCCs 1J1-2E & 1J1-2W.
*(c) Opens all other breakers on MCCs 1J1-2E & 1J1-2W by rotating handles to the OFF position.

Evaluator's Comments

---

* 8. LOCALLY CLOSE SUPPLY BREAKER FOR 1-IA-C-1 (IA COMPRESSOR).

Standards

At MCC 1J1-2, closes breaker 1J1-2E 2A by rotating handle to the ON position.

Evaluator's Comments

---

9. LOCALLY VERIFY FUSES INSTALLED IN CROSSTIE BREAKER (15H1).

Standards

(a) Proceed to 4160V breaker 15H1.
(b) Verifies the breaker control power fuses are installed.
(c) Verifies breaker trip fuses are installed in fuse socket.

CUES

- **If asked**: Trip and control fuses are already installed properly in fuse sockets.

Evaluator's Comments

10. LOCALLY VERIFY CHARGING SPRING TOGGLE SWITCH FOR 15H1 IS ON.

Standards

Observes bottom area of breaker to verify the breaker charging spring toggle switch is in the ON position.

CUES

- **If asked**: Breaker charging spring toggle switch is ON.

Evaluator's Comments

* 11. LOCALLY RACK-IN THE EMERGENCY BUS CROSS-TIE BREAKER (15H1).

Standards

Performs the following:
(a) Checks breaker racked to the DISCONNECT position by opening breaker door and observing mechanical position indicator inside cubicle.
(b) Closes breaker door.
(c) Obtains breaker racking tool from storage hanger.
(d) Inserts breaker racking tool into racking mechanism.
(e) Rotates racking screw interlock mechanism clockwise until racking interlock is released.
*(f) Racks breaker to the test and then CONNECT position by turning racking tool in the clockwise direction.
(g) Removes breaker racking tool from racking mechanism.

CUES

- **If asked**: Breaker initially racked to DISCONNECT position.
- **If asked**: No green tags seen; no ground straps installed.
- **If asked**: SS approval for RED tag removal granted.
- **If asked**: When breaker correctly racked, it is in CONNECT position.

Evaluator's Note

0-OCP-EP-200 and/or 0-MOP-EP-200 may be utilized by operator to rack in breaker 15H1.

Evaluator's Comments

---

* 12. LOCALLY PLACE 1-IA-C-1 IN OFF.

Standards

Proceeds to Unit 2 Turbine Building Basement and locates 1-IA-C-1 control panel.

*(a) Places 1-IA-C-1 Control Switch in OFF.

CUES

- When switch placed in OFF a click is sensed.

Evaluator's Comments

---

13. INFORM UNIT 1 OPERATOR OF CROSS-CONNECT OF 1H & 1J EMERGENCY BUSES.

Standards

Informs Unit 1 operator of action that will cross-connect the 1H and 1J emergency buses.

Evaluator's Comments

---

* 14. CLOSE EMERGENCY BUS CROSS-TIE BREAKER, 15H1.

Standards

Proceeds to Emergency Generator No. 1 control panel on MCR and performs the following:

(a) Removes breaker control for 15H1 from PTL.
*(b) Places breaker control for 15H1 to the CLOSED position.
(c) Verifies breaker closes (red light lit).
(d) Checks voltage indicated on 1J bus voltmeter.

CUES

- **If asked**: 15H1 initial indication is green light on & red off.
- **If asked**: After proper closure, 15H1 red light is on and green off.
- **If asked**: 1H & 1J bus voltage indicates 4200 volts.
- **If local closure attempted using the breaker close lever TELL operator: Breaker operating noise heard; it initially indicated red light lit; then breaker operating noise heard again and breaker indication shows green light lit.**
- If local closure attempted using the local control switch, TELL operator that the green light is on and the local indicator indicates open.

Evaluator's Comments

---

15. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that 1H & 1J emergency buses cross-tied.

Evaluator's Comments **STOP TIME:** _____

Evaluation Items

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. During the performance of Part 1 step 3, you arrive at the stub bus tie breaker, 15J9, and the breaker is still closed.

   Why should you locally open this breaker before continuing the procedure?

ANSWER

To ensure the emergency bus is stripped of all loads prior to cross-tie (the RHR & CC pumps were not locked out by the previous steps).

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
APE056.AA2.49 RO3.0/SRO3.4	1 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED?
• ECA-0.1, Attachment 2	YES

Evaluation Items
(Continued)

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. While racking in breaker 15H1, the racking mechanism broke and you were unable to cross-tie the H & J buses.

   What alternate method would be available to restore IA pressure?

ANSWER

Cross-tie Unit 2 H & J buses (to restore the U-2 IA compressor).

Alternate acceptable answer - Start the diesel-driven air compressor.

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
SYS062.A2.01 RO3.4/SRO3.9	1 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED?
• 2-ECA-0.1	YES
• ARP 1B-E6	YES

Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 35.03 (Rev 13)
CROSS-TIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2)

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **15 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Licensed Operator Programs
FOLLOW UP QUESTION PERFORMANCE SUMMARY
Job Performance Measure 35.03 (Rev 13)
CROSS-TIE UNIT 1 EMERGENCY BUSES TO RESTORE IA (ECA-0.1, ATT 2)

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

QUESTION #1: N/A _____ Fractional Score _____ Final Score: 1 / 0
($\geq$0.7 = 1 or <0.7 = 0)

Est Completion Time: **1 Min** Actual Completion Time: _____

Comments: _____

QUESTION #2: N/A _____ Fractional Score _____ Final Score: 1 / 0
($\geq$0.7 = 1 or <0.7 = 0)

Est Completion Time: **1 Min** Actual Completion Time: _____

Comments: _____

Evaluation Items
Question 2 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. While racking in breaker 15H1, the racking mechanism broke and you were unable to cross-tie the H & J buses.

   What alternate method would be available to restore IA pressure?

Evaluation Items

Question 1 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

1. During the performance of Part 1 step 3, you arrive at the stub bus tie breaker, 15J9, and the breaker is still closed.

   Why should you open this breaker before continuing the procedure?

Licensed Operator Programs
Operator Directions Handout

Conditions

- Task is to be SIMULATED in the plant.
- A simulated loss of all on- and off-site power (blackout) has previously occurred on Unit 1. The #1 EDG has been restored and bus 1H is energized (1J & 2J buses are dead). ECA-0.1 is in progress at step 3 to establish IA.

Initiating Cues

- 1-ECA-0.1, Attachment 1, step 3.
- Shift Supervisor direction.

Directions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. We are recovering from a loss of all AC power. Currently, both 1H and 2H emergency buses are energized, however, both unit J buses are deenergized.
- Here is 1-ECA-0.1, Attachment 2. I need you to cross-tie Unit 1 emergency buses by performing all of Part 1 and Part 2 through step 6.
- When you finish the actions necessary to accomplish this, please inform me so that the Turbine Building Operator can line up fire water cooling and start the IA compressor.

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 13.02 (Rev 07)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

LOCALLY START THE EMERGENCY SERVICE WATER PUMPS w/ strainer swap required to prevent overtemperature condition on the diesel.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO		_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
SYS076.A2.01 (RO 3.5/SRO 3.7)	NLO 3.17

Conditions

- Task is to be SIMULATED in the plant at the Low Level Intake Structure.
- Any plant mode/condition.

Standards

- 1-SW-P-1C running IAW 0-OP-SW-002.

Initiating Cues

- AP-12.01, Loss of Intake Canal Level, step 10.
- Shift Supervisor direction to start an Emergency Service Water Pump.

Terminating Cues

- Completion of 0-OP-SW-002, Diesel Driven ESW Pump Operation, step 5.10.6.

Procedures

- 0-OP-SW-002, Diesel Driven ESW Pump Operation.

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment

Performance Checklist

Directions to the Operator.

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. The plant is currently losing intake canal level.
- You are to locally start the "C" Emergency Service Water pump in accordance with 0-OP-SW-002.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 15 before 18.
- **START TIME:** _____

---

1. READ PRECAUTIONS AND LIMITATIONS.

   Standards

   Notes all applicable precautions & limitations.

   Evaluator's Comments

---

2. CHECK ESW PUMP 1-SW-P-1C IS NOT STOP LOGGED.

   Standards

   (a) Proceeds to 2B CW pump trash rack.
   (b) Checks 2B CWP intake bay for the presence of stop logs.

   CUES

   - **If asked**: As is.

   Evaluator's Comments

---

3. OPEN THE ESW PUMP HOUSE AIR LOUVERS.

   Standards

   (a) Opens the chain-operated damper located between the "A" & "B" ESW pumps in overhead (1-VS-DMP-102).
   (b) Proceeds to west wall of ESW pump house and opens the 4 dampers by turning the damper handwheels (1-VS-DMP-103, -104, -105 & -106).

   CUES

   - **If asked**: as each is found & properly operated, it opens.

   Evaluator's Comments

---

4. VERIFY DIESEL FUEL OIL TANK (1-SW-TK-1) LEVEL.

Standards

Verifies diesel fuel oil tank level greater than administrative limit of 4350 gallons by pumping up indicator.

CUES

- **If asked**: after pumping up indicator point to a value of 4600 gallons.

Evaluator's Comments

5. VERIFY POSITION OF DIESEL SPEED CONTROL LEVER.

Standards

(a) Observes note on Diesel Speed Control Lever location/position.
(b) Proceeds to diesel mounted local control panel (southside on pump).
(c) Checks the speed control lever set at approximately 1/2 to 2/3 full throttle position.

CUES

- **If asked**: speed control lever at the 2/3 full throttle position.

Evaluator's Comments

6. VERIFY CLUTCH HANDLE ENGAGED.

Standards

(a) Observes note concerning clutch handle engage position.
(b) Proceeds to clutch housing (on same side of diesel as controls).
(c) Checks clutch handle engaged (lever positioned toward diesel).

CUES

- **If asked**: lever positioned toward diesel.

Evaluator's Comments

7. VERIFY ENGINE OIL LEVEL.

Standards

(a) Proceeds to north side of ESW pump diesel.
(b) Checks engine oil level between the full (F) and low (L) marks on the dipstick.

CUES

- **If asked**: oil between full & low marks on dipstick.

Evaluator's Comments

---

8. VERIFY PUMP ANGLE DRIVE OIL LEVEL.

Standards

(a) Proceeds to north side of ESW pump right angle gear drive.
(b) Simulates removing oil fill plug (turns to left to loosen).
(c) Checks pump oil level is between the bottom and 1/4 inch below the bottom of fill hole.
(d) Simulates replacing oil fill plug (turns to right to tighten).

CUES

- **If asked**: oil nearly level with the bottom of fill hole.

Evaluator's Comments

---

9. VERIFY VENT TRAP VALVE IS OPEN.

Standards

(a) Locates pump vent trap valve, 1-SW-296 (located below right angle gear drive oil fill plug).
(b) Checks 1-SW-296 open.

CUES

- **If asked**: 1-SW-296 as is.

Evaluator's Comments

---

10. VERIFY ESW PUMP AUTOMATIC AIR SHUTOFF IS RESET.

Standards

(a) Refers to Attachment 1.
(b) Proceeds to south side of ESW pp on top of diesel.
(c) Checks cam from SOV side to ensure trip latch engaged in cam tooth.

CUES

- **If asked**: trip latch is as is.

Evaluator's Comments

---

11. VERIFY THE ESW PUMP FUEL OIL VALVES OPEN.

Standards

(a) Verifies 1-SW-288, ESW Pump 1C Fuel Oil Inlet is open.
(b) Verifies 1-SW-289, ESW Pump 1C Fuel Oil Outlet is open.
(c) Verifies 1-SW-290, Fuel Oil Supply Isolation is open.
(d) Verifies 1-SW-292, Fuel Oil Return Isolation is open.

Evaluator's Comments

---

12. VERIFY BREAKER 2G1-1B-1D2 CLOSED.

Standards

Verifies breaker 2G1-1B-1D2 for 1-SW-P-1C Battery Charger Feeder closed.

CUES

- **If asked**: Breaker 2-G1-1B-1D2 indicates as is.

Evaluator's Comments

---

13. CLOSE PUMP FLOW INDICATOR LOW AND HIGH SIDE DRAINS.

Standards

(a) Observes note and refers to attachment 4.
(b) Closes 1-SW-ICV-3121, ESW Pump Discharge FI-121 (H) Isolation.
(c) Closes 1-SW-ICV-3122, ESW Pump Discharge FI-121 (L) Isolation.

Evaluator's Comments

---

14. Verifies Pre-Start Checks Complete

Standards

Verify caution about starting 2-CS-P-1B while 1-SW-P-1C is running. Verify Subsection 5.9, Pre-Start checks for SW-P-1C is complete.

Evaluator's Comments

---

* 15. START ENGINE.

Standards

(a) Acknowledges CAUTION about verifying engine oil pressure to prevent engine damage.
*(b) Within 10 to 15 seconds of engine start, verify engine oil pressure is at least 5 psig.
(c) Within 30 to 45 seconds of engine start, verify engine oil pressure is at least 25 psig.
(d) Acknowledges CAUTION that start attempts are limited to four 30 second attempts with a 3 minute wait between attempts.
*(e) At local wall mounted control station, pushes START button and records time pump was started.
(f) Verifies engine start.

CUES

- If start pushbutton is depressed only momentarily, then tell operator: the engine turns over, but stops.
- If the start pushbutton is maintained in the depressed position for a reasonable but short (< 15 sec.) period of time, then tell operator: engine start noise is heard & indicated speed is 1500 rpm.

Evaluator's Comments

---

16. VERIFIES ADEQUATE ENGINE OIL PRESSURE.

Standards

(a) Within 10 to 15 seconds of engine start, verify engine oil pressure is at least 5 psig.
(b) Within 30 to 45 seconds of engine start, verify engine oil pressure is at least 25 psig.

CUES

- **If asked**: Engine oil pressure is > 5 psig after 10 seconds.
- **If asked**: Engine oil pressure is > 25 psig after 30 seconds.

Evaluator's Comments

---

17. VERIFY THE PUMP VENT TRAP STOPS VENTING.

Standards

(a) Locates pump vent trap valve (1-SW-296, located below right angle gear drive oil fill plug).
(b) Checks pump vent trap stops venting air.

CUES

- **If asked**: no air vent noise heard.

Evaluator's Comments

---

* 18. ADJUST ENGINE SPEED.

Standards

(a) Proceeds to diesel mounted local control panel (southside on pump).
*(b) Slowly moves throttle to full speed position (down).

CUES

- **If asked**: point to 1800 rpm after throttle adjustment.

Evaluator's Comments

---

19. VERIFY THAT THER ARE NO FUEL OR LUBE OIL LEAKS.

Standards

Inspects equipment for leakage.

CUES

- **If asked**: no visible leaks exist.

Evaluator's Comments

* 20. MANUALLY CONTROL ENGINE TEMPERATURE

Standards

Throttle 1-SW-5, ESW Pump 1C Engine Clg Outlet, as required to control the engine water temperature between 165°F and 185°F. IF at any time while the engine is running, the cooling water valve is fully open AND the engine water temperature continues to rise, THEN swap the 1-SW-STR-4C, ESW Pump 1C Clg Wtr Str, AND clean the strainer that was in service.

CUES

- **If asked**: Temperature is 180°F and rising.

Evaluator's Comments

Cue that temperature drops as valve is opened, but that it begins to rise again. Continue until valve is fully open or the 1-SW-STR-4C strainer is swapped. If strainer is swapped, allow temperature to be controlled and go to element 22 of JPM. If the strainer is not swapped, then proceed to element 21 of JPM.

---

* 21. Manually trips Diesel on prior to exceeding 210°F

Standards

IF the engine water temperature can NOT be maintained less than 210°F, THEN immediately trip the ESW Pump Diesel from the 1-SW-PNL-1C, Diesel Control Panel, AND notify the Shift Supervisor.

CUES

If strainer has not been swapped, indicate that temperature is 210°F and rising.
After diesel tripped, indicate that the engine has stopped.

- **If asked**: As Shift Supervisor, indicate that pump is required for current plant conditions and ask what the operator recommends.

Evaluator's Comments
The correct recommendation is to swap strainers and restart the engine.

---

22. REPORT TO SHIFT SUPERVISOR (EVALUATOR)

Standards

Verbal status report made of task completion.

Evaluator's Comments **Stop Time:**

MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT
DOCUMENT REVISION RECORD

Dist. No.	Rev. No.	Date Issued	Reason for Revision	TIR Number(s)
01	0	08/03/92		
02	1	07/13/93	Step number change in ECA-1.1.	S93-0857
03	2	08/22/94	Reflect latest revision of OP-CS-004.	S94-0887
04	3	09/16/96	KA number and procedure changes; component label verification.	S96-0252
05	4	03/25/98	Delete JPM # from trainee handouts.	S98-0286
06	5	12/09/98	Convert to Word.	S98-0936

Virginia Power
Surry Power Station

Licensed Operator Programs
Job Performance Measure 53.01B (Rev 05)

Operator_____ Evaluator_____

Observer _____ Evaluation Date _____

Task

MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT.

Applicability	**Est Completion Time**	**Actual Time**
RO/SRO	20 Minutes	_____

NUREG-1122 Importance Ratings	**Surry Importance Rating**
SYS006.A2.02 (RO 3.9/SRO 4.3) GEN2.1.20 (RO 4.3/SRO 4.2)	NLO 4.70/RO 4.57/SRO 4.67

Conditions

- Task is to be SIMULATED in the plant.
- A Loss of Emergency Coolant Recirculation has occurred on Unit 2. The RWST level is extremely low and in need of being replenished.

Standards

- 2-OP-CS-004, Refueling Water Storage Tank Makeup.

Initiating Cues

- 2-ECA-1.1, Loss of Emergency Coolant Recirculation, step 4.
- Shift Supervisor direction.

Terminating Cues

- 2-OP-CS-004, Refueling Water Storage Tank Makeup, step 5.2.8 completed.

Procedures

- 2-OP-CS-004, Refueling Water Storage Tank Makeup.

Tools and Equipment

- None

Safety Considerations

- Standard Personal Safety Equipment
- **ALARA**
- DO NOT enter contaminated areas.

Performance Checklist

Directions to the Operator.

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. We are currently experiencing a Loss of Emergency Coolant Recirculation on Unit 2. Unit 2's RWST level is extremely low and in need of being replenished.
- Here is a copy of 2-OP-CS-004. I need you to initiate makeup to Unit 2's RWST from the Spent Fuel Pit.
- When you finish the actions necessary to accomplish this, please inform me.

Notes to the Evaluator.

- This task is to be SIMULATED. Do NOT allow the operator to manipulate controls, operate switches or reposition valves.
- Task critical elements are denoted by an asterisk (*). If substeps of a critical element also have an asterisk (*), then only those asterisked substeps are critical to performance of that task element.
- Critical step sequencing requirements: 8 before 9.
- **START TIME:** _____

---

1. REVIEW INITIAL CONDITIONS AND PRECAUTIONS & LIMITATIONS.

Standards

(a) Checks Initial Conditions satisfied.
(b) Reviews Precautions and Limitations.

CUES

- **If asked:** MCR personnel will track RWST level & inform when desired level is reached.
- **If asked:** An operator has been dispatched to safeguards to control access to the valve pit area.

Evaluator's Comments

---

2. VERIFY SFP BORON CONCENTRATION.

Standards

Verifies that the SFP boron concentration is adequate for RWST addition.

CUES

- **If asked:** SFP boron concentration is 2410 ppm.

Evaluator's Comments

---

3. VERIFY SFP PURIFICATION SYSTEM IN SERVICE.

Standards

(a) Proceeds to Fuel Building Basement.
(b) Checks that at least one SFP Cooling Pump (1-FC-P-1A or 1B) is in operation by:
- checking adequate pump discharge pressure, and
- local pump control switch indicating lights.

(c) Checks that at least one SFP Purification Pump (1-FC-P-3A or 3B) is operating by:
- checking adequate pump discharge pressure, and
- local pump control switch indicating lights.

CUES

- **If asked:** 1-FC-P-1A local control indicating lights indicate RED on & GREEN off. Pump & shaft are rotating. 1-FC-PI-101A reads 34#.
- **If asked:** 1-FC-P-1B local control indicating lights indicate GREEN on & RED off. Pump & shaft are NOT rotating. 1-FC-PI-101B reads 0#.
- **If asked:** 1-FC-P-3A local control indicating lights indicate RED on & GREEN off. Pump & shaft are rotating.
- **If asked:** 1-FC-P-3B local control indicating lights indicate GREEN on & RED off. Pump & shaft are NOT rotating.

Evaluator's Comments

---

4. STOP SFP SKIMMER PUMP.

Standards

(a) Determines that the "A" SFP Skimmer pump is in operation by observing local pump indicating lights and pump discharge pressure.
(b) Secures the "A" Skimmer pump by placing the control switch to the OFF position.

CUES

- **If asked:** 1-FC-P-2A local control indicating lights indicate RED on & GREEN off. Pump & shaft are rotating.
- **If asked:** 1-FC-PI-102A reads 22# prior to securing 1-FC-P-2A.
- **If asked:** 1-FC-PI-102A reads 0# after securing 1-FC-P-2A.
- **If asked:** 1-FC-P-2B local control indicating light indicates GREEN on & RED off. Pump & shaft are NOT rotating. 1-FC-PI-102B reads 0#.

Evaluator's Comments

---

5. REQUEST MCR TO STOP OPERATING RWST RECIRC PUMP.

Standards

(a) Contacts Unit 2 MCR via gai-tronics or telephone.
(b) Requests that the operating RWST recirc pump be secured.

CUES

- **If asked:** RWST recirc pumps are already secured due to low RWST level.

Evaluator's Comments

---

6. VERIFY CLOSED 1-FC-73, UNIT 1 RWST RECIRC PUMPS DISCHARGE ROOT VALVE.

Standards

(a) Proceeds to 13' Aux Building "IX Alley" area.
(b) Locates 1-FC-73 (on IX Alley on deck).
(c) Verifies 1-FC-73 closed by attempting to turn the handwheel in the clockwise direction.

Evaluator's Comments

---

7. OPEN OR VERIFY OPEN 2-FC-74, UNIT 1 RWST TO FC SUP HDR ISOL.

Standards

(a) Proceeds to Unit 2 Safeguards basement.
(b) Locates 2-FC-74 above the RS rad monitor house approximately 10' off floor.
(c) Verifies 2-FC-74 open by turning handwheel clockwise to move valve off open seat then counter-clockwise to fully open valve.

Evaluator's Comments

---

* 8. OPEN 2-FC-73 (MANUAL ISOLATION TO/FROM UNIT 2 RWST).

Standards

(a) Proceeds to 13' Aux Bldg "IX Alley" area.
(b) Locates 2-FC-73 (approx mid way down alley on deck).
*(c) Opens 2-FC-73 (by turning handwheel counter-clockwise).

Evaluator's Comments

---

* 9. CLOSE 1-FC-16 (INLET TO THE SPENT FUEL PIT IX).

Standards

(a) Locates 1-FC-16 (approx mid way down alley on wall).
*(b) Closes 1-FC-16 (by turning handwheel clockwise).

CUES

- **If asked:** 1-FC-FI-102 indicates 114 gpm prior to closing 1-FC-16.
- **If asked:** 1-FC-FI-102 indicates 0 gpm after closing 1-FC-16.

Evaluator's Comments

---

10. REPORT TO SHIFT SUPERVISOR (EVALUATOR).

Standards

Verbal status report made that RWST makeup initiated.

Evaluator's Comments **STOP TIME:** _____

Evaluation Items

The following question is related to the conditions and task that has just been performed. However, a condition not encountered during task performance has been added. Please indicate when you have finished answering the question.

1. Shortly after completing the RWST makeup lineup, the operating Spent Fuel Pit Cooling pump tripped and RWST level stopped increasing.

   Briefly explain why RWST makeup stops when the Spent Fuel Pit Cooling system is not in service.

ANSWER

Purification pumps take suction from SFP Cooling Pp discharge.

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE	EST TIME	ACTUAL TIME
EPE009.EK3.21 RO4.2/SRO4.5 EPE011/.EK3.12 RO4.4/SRO4.6	1 Min	_____

QUESTION REFERENCE	REFERENCE ALLOWED?
• 11448-FM-81A (sh 1)	YES
• NCRODP #49 (fig 49-1)	NO

Evaluation Items
(Continued)

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. Briefly explain the basis for securing the Spent Fuel Pit Skimmer Pump(s) during the lineup to initiate RWST makeup.

ANSWER

This is to prevent the skimmer pump from losing suction as SFP water level decreases.

(Skimmer has floating suction that must be lowered as SFP water level decreases in order to maintain water flowing over the edge of the suction float.)

COMMENTS

_____

_____

_____

_____

_____

_____

_____

_____

NUREG-1122 K/A REFERENCE		EST TIME	ACTUAL TIME
EPE009.EK3.21	RO4.2/SRO4.5	1 Min	_____
EPE011.EK3.12	RO4.4/SRO4.6		

QUESTION REFERENCE	REFERENCE ALLOWED?
• 11448-FM-81A (sh 1)	YES
• NCRODP #49 (fig 49-1)	NO

Evaluator's Summary
Job Performance Measure 53.01B (Rev 05)
MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT

Surry Power Station
Licensed Operator Programs
TASK PERFORMANCE SUMMARY
Job Performance Measure 53.01B (Rev 05)
MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

Est Completion Time: **20 Min** Actual Time: ___ **Min** Time Critical? Yes ☐ No ☒

Critical step sequencing requirements satisfied? Yes ☐ No ☐ N/A ☐

Performance Evaluation: Satisfactory ☐ Unsatisfactory ☐

• Self Checking observed:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Procedure compliance:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	
• Place keeping utilized:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Communicated IAW Standards:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

JPM Performance Comments:

• Proper HP practices:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐
• Verbalized actions:	Always: ☐	Usually: ☐	Seldom: ☐	Never: ☐	N/A: ☐

Licensed Operator Programs
FOLLOW UP QUESTION PERFORMANCE SUMMARY
Job Performance Measure 53.01B (Rev 05)
MAKEUP TO THE UNIT 2 RWST FROM THE SPENT FUEL PIT

Performed by: _____ Evaluation Date: _____

Evaluated by: _____

QUESTION #1: N/A _____ Fractional Score _____ Final Score: 1 / 0
($\geq$0.7 = 1 or <0.7 = 0)

Est Completion Time: **1 Min** Actual Completion Time: _____

Comments: _____

QUESTION #2: N/A _____ Fractional Score _____ Final Score: 1 / 0
($\geq$0.7 = 1 or <0.7 = 0)

Est Completion Time: **1 Min** Actual Completion Time: _____

Comments: _____

Evaluation Items

Question 2 Operator Handout

The following question is related to the conditions and task that has just been performed. Please indicate when you have finished answering the question.

2. Briefly explain the basis for securing the Spent Fuel Pit Skimmer Pump(s) during the lineup to initiate RWST makeup.

Evaluation Items

Question 1 Operator Handout

The following question is related to the conditions and task that has just been performed. However, a condition not encountered during task performance has been added. Please indicate when you have finished answering the question.

1. Shortly after completing the RWST makeup lineup, the operating Spent Fuel Pit Cooling pump tripped and RWST level stopped increasing.

   Briefly explain why RWST makeup stops when the Spent Fuel Pit Cooling system is not in service.

Conditions

- Task is to be SIMULATED in the plant.
- A Loss of Emergency Coolant Recirculation has occurred on Unit 2. The RWST level is extremely low and in need of being replenished.

Initiating Cues

- 2-ECA-1.1, Loss of Emergency Coolant Recirculation, step 4.
- Shift Supervisor direction.

Directions

- This task is to be SIMULATED. Do NOT turn switches, manipulate controls or reposition valves.
- I am the Shift Supervisor. We are currently experiencing a Loss of Emergency Coolant Recirculation on Unit 2. Unit 2's RWST level is extremely low and in need of being replenished.
- Here is a copy of 2-OP-CS-004. I need you to initiate makeup to Unit 2's RWST from the Spent Fuel Pit.
- When you finish the actions necessary to accomplish this, please inform me.