

August 15, 2002
NTD-02-040



Mr. Alan Blamey
U.S. Nuclear Regulatory Commission
Region 1
475 Allendale Road
King of Prussia, PA 19406-1415

Dear Mr. Blamey:

SALEM INITIAL LICENSE EXAMINATION

Enclosed is our proposed outline for the initial license examination to be conducted for Salem Reactor Operator and Senior Reactor Operator candidates on November 4, 2002. Included are:

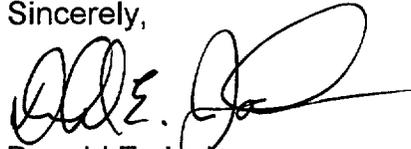
- Form ES-201-2, Examination Outline Quality Checklist
- Form ES-301-1, Administrative Topics Outlines for RO and SRO candidates
- Form ES-301-2, Control Room Systems and Facility Walkthrough Test Outlines for RO and SRO candidates
- Form ES-301-4, Simulator Scenario Quality Checklist (applicable sections signed off)
- Form ES-301-5, Transient and Event Checklists for RO and SRO candidates
- Form ES-301-6, Competencies Checklist
- Form ES-401-3&5, PWR SRO Examination Outline
- Form ES-401-4&5, PWR RO Examination Outline
- Form ES-401-10, Record of Rejected K/As for SRO and RO Outlines

Also included is a proposed examination schedule and position rotation for scenarios, which may be helpful in your review of the outlines.

If you have any questions or comments, please call Frank Kaminski at 856-339-3884 or Archie Faulkner at 856-339-3966. For major issues, the Operations Training Manager, Jim Reid, can be reached at 856-339-3896. All individuals are on the Examination Security Agreement.

We respectfully request that the examination materials be withheld from public disclosure until after the examination is complete.

Sincerely,

A handwritten signature in black ink, appearing to read 'D.E. Jackson', with a long horizontal flourish extending to the right.

Donald E. Jackson
Manager – Nuclear Training

DEJ:al
Attachments (11)

C (w/o attachments)
J. Reid
A. Faulkner
F. Kaminski
Licensing & Regulation
NBS Records

Facility: Salem Units 1&2		Date of Exam: 11/02				Exam Level: SRO							
Tier	Group	K/A Category Points										Point Totals	
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4		G *
1. Emergency & Abnormal Plant Evolutions	1	3	1	4				5	10			1	24
	2	3	1	2				4	4			2	16
	3	0	0	0				0	3			0	3
	Tier Totals	6	2	6				9	17			3	43
2. Plant Systems	1	1	0	2	2	3	0	3	4	1	0	3	19
	2	1	1	2	2	1	3	0	2	2	3	0	17
	3	0	1	0	2	1	0	0	0	0	0	0	4
	Tier Totals	2	2	4	6	5	3	3	6	3	3	3	40
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		
					3		7		4		3		17
<p>Note:</p> <ol style="list-style-type: none"> 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. 													

SALEM NRC License Examination
PWR SRO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000001 / Continuous Rod Withdrawal / 1						X	AA2.04	Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Reactor power and its trend.	4.3	1
000003 / Dropped Control Rod / 1				X			AK3.08	Knowledge of the reasons for the following responses as they apply to the Dropped Control Rod: Criteria for inoperable control rods.	4.2	1
000005 / Inoperable/Stuck Control Rod / 1						X	AA2.03	Ability to determine and interpret the following as they apply to the Inoperable/Stuck Control Rod: Required actions if more than one rod is stuck or inoperable.	4.4	1
000011 / Large Break LOCA / 3						X	EA2.07	Ability to determine or interpret the following as they apply to a Large Break LOCA: That equipment necessary for functioning of critical pump water seals is operable.	3.4	1
W/E04 / LOCA Outside Containment / 3					X		EA1.3	Ability to operate and/or monitor the following as they apply to the (LOCA Outside Containment): Desired operating results during abnormal and emergency situations.	4.0	1
W/E04 / LOCA Outside Containment / 3					X		EA1.1	Ability to operate and/or monitor the following as they apply to the (LOCA Outside Containment): Components and functions of control and safety systems, including instrumentation, signals, interlocks, failure modes, and automatic and manual features.	4.0	1
W/E01 & E02 / Rediagnosis & SI Termination / 3			X				EK2.2	Knowledge of the interrelations between the Reactor Trip or Safety Injection/Re-diagnosis and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	3.6	1
000015 / 17 / RCP Malfunctions / 4	X						2.1.28	Conduct of Operations: Knowledge of the purpose and function of major system components and controls.	3.3	1
BW/E09; CE/A13; W/E09 & E10 / Natural Circ. / 4						X	EA2.1	Ability to determine and interpret the following as they apply to the (Natural Circulation Operations): Adherence to appropriate procedures and operation within the limitations in the facility's license and amendments.	3.8	1
BW/E09; CE/A13; W/E09 & E10 / Natural Circ. / 4		X					EK1.1	Knowledge of the operational implications of the following concepts as they apply to the (Natural Circulation Operations): Components, capacity and function of emergency systems	3.4	1
000024 / Emergency Boration / 1		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to Emergency Boration: Relationship between boron addition and change in T-ave.	3.8	1
000026 / Loss of Component Cooling Water / 8						X	AA2.03	Ability to determine and interpret the following as they apply to the Loss of Component Cooling Water: The valve lineups necessary to restart the CCWS while bypassing the portion of the system causing the abnormal condition.	2.9	1

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Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000026 / Loss of Component Cooling Water / 8				X			AK3.03	Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: Guidance action contained in EOP for Loss of CCW	4.2	1
000029 / Anticipated Transient w/o Scram / 1				X			EK3.01	Knowledge of the reasons for the following responses as they apply to the ATWS: Verifying a reactor trip; methods.	4.5	1
000040 (BW/E05; CE/E05; W/E12) / Steam Line Rupture – Excessive Heat Transfer / 4					X		AA1.05	Ability to operate and/or monitor the following as they apply to the Steam Line Rupture: Manual and automatic RPS trip initiation.	4.5	1
CE/A11; W/E08/ RCS Overcooling – PTS / 4						X	EA2.1	Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	4.2	1
000051 / Loss of Condenser Vacuum / 4						X	AA2.01	Ability to determine and interpret the following as they apply to the Loss of Condenser Vacuum: Cause for low vacuum condition.	2.7	1
000055 / Station Blackout / 6						X	EA2.06	Ability to determine or interpret the following as they apply to a Station Blackout: Faults and lockouts that must be cleared prior to re-energizing buses.	4.1	1
000057 / Loss of Vital AC Elec. Inst. Bus / 6										
000059 / Accidental Liquid Radwaste Rel. / 9					X		AA1.02	Ability to operate and/or monitor the following as they apply to the Accidental Liquid Radwaste Release: ARM system.	3.4	1
000062 / Loss of Nuclear Service Water / 4				X			AK3.02	Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: The automatic actions (alignments) within the nuclear service water system resulting from the actuation of the ESFAS	3.9	1
000067 / Plant Fire On-site / 9						X	AA2.12	Ability to determine and interpret the following as they apply to the Plant Fire on Site: Location of vital equipment within fire zone.	3.9	1
000068 (BW/A06) / Control Room Evac. / 8										
000069 (W/E14) / Loss of CTMT Integrity / 5						X	AA2.02	Ability to determine and interpret the following as they apply to the Loss of Containment Integrity: Verification of automatic and manual means of restoring integrity.	4.4	1
000074 (W/E06 & E07) / Inad. Core Cooling / 4					X		EA1.14	Ability to operate and monitor the following as they apply to Inadequate Core Cooling: Alarm for loss of subcooling margin.	4.2	1
000074 (W/E06 & E07) / Inad. Core Cooling / 4		X					EK1.2	Knowledge of the operational implications of the following concepts as they apply to the (Saturated Core Cooling): Normal, abnormal and emergency operating procedures associated with (Saturated Core Cooling).	3.6	1
BW/E03 / Inadequate Subcooling Margin / 4										
000076 / High Reactor Coolant Activity / 9										

SALEM NRC License Examination
 PWR SRO Written Examination Outline
 Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
BW/A02 & A03 / Loss of NNI-X/Y / 7										
K/A Category Point Totals:	1	3	1	4	5	10	Group Point Total:			24

SALEM NRC License Examination
PWR SRO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000007(BW/E02 & E10; CE/E02) / Reactor Trip – Stabilization – Recovery / 1					X		EA1.08	Ability to operate and monitor the following as they apply to a reactor trip: AFW System.	4.3	1
BW/A01 / Plant Runback / 1										
BW/A04 / Turbine Trip / 4										
000008 / Pressurizer Vapor Space Accident / 3						X	AA2.19	Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: PZR spray valve failure, using plant parameters	3.6	1
000009 / Small Break LOCA / 3						X	EA2.30	Ability to determine or interpret the following as they apply to a small break LOCA: Tech Specs limits for plant operation with less than four loops.	3.5	1
BW/E08; W/E03 / LOCA Cooldown – Depress./ 4		X					EK1.3	Knowledge of the operational implications of the following concepts as they apply to LOCA Cooldown and Depressurization: Annunciators and conditions indicating signals, and remedial actions associated with the (LOCA Cooldown and Depressurization).	3.6	1
W/E11 / Loss of Emergency Coolant Recirc./ 4		X					EK1.2	Knowledge of the operational implications of the following concepts as they apply to the (Loss of Emergency Coolant Recirculation): Normal, abnormal and emergency operating procedures associated with (Loss of Emergency Coolant Recirculation).	4.1	1
000022 / Loss of Reactor Coolant Makeup / 2					X		AA1.08	Ability to operate and/or monitor the following as they apply to the Loss of Reactor coolant Pump Makeup: VCT level.	3.3	1
000025 / Loss of RHR System / 4						X	AA2.04	Ability to determine and interpret the following as they apply to the Loss of Residual Heat Removal System: Location and isolability of leaks.	3.6	1
000027 / Pressurizer Pressure Control System Malfunction / 3						X	AA2.10	Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunctions: PZR heater energized/de-energized condition.	3.6	1
000032 / Loss of Source Range NI/ 7										
000033 / Loss of Intermediate Range NI / 7					X		AA1.01	Ability to operate and/or monitor the following as they apply to the Loss of Intermediate Range Nuclear Instrumentation: Power-available indicators in cabinets or equipment drawers.	3.1	1
000037 / Steam Generator Tube Leak / 3				X			AK3.05	Knowledge of the reasons for the following responses as they apply to the SG tube leak: Actions contained in procedures for radiation monitoring, RCS water inventory balance, SG tube failure, and plant shutdown	4.0	1
000038 / Steam Generator Tube Rupture / 3					X		EA1.11	Ability to operate and monitor the following as they apply to a SGTR: S/G level indicators.	3.9	1
000054 (CE/E06) / Loss of Main Feedwater / 4	X						2.4.18	Emergency Procedures Plan: Knowledge of the specific bases for EOP's	3.6	1

SALEM NRC License Examination
PWR SRO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
BW/E04; W/E05 / Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4	X						2.4.4	Emergency Procedures/Plan: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures	4.3	1
000058 / Loss of DC Power / 8		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to a Loss of DC Power: Battery charger equipment and instrumentation.	3.1	1
000060 / Accidental Gaseous Radwaste Rel. / 9										
000061 / ARM System Alarms / 7			X				AK2.01	Knowledge of the interrelations between the Area Radiation Monitoring (ARM) System Alarms and the following: Detectors at each ARM system location.	2.6	1
W/E16 / High Containment Radiation / 9				X			EK3.2	Knowledge of the reasons for the following responses as they apply to the (High Containment Radiation): Normal, abnormal and emergency operating procedures associated with (High Containment Radiation).	3.3	1
000065 / Loss of Instrument Air / 8										
CE/E09 / Functional Recovery										
K/A Category Point Total:	2	3	1	2	4	4	Group Point Total:			16

SALEM NRC License Examination
PWR SRO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 3

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000028 / Pressurizer Level Malfunction / 2						X	AA2.12	Ability to determine and interpret the following as they apply to the Pressurizer Level Control Malfunctions: Cause for PZR level deviation alarm: controller malfunction or other instrumentation malfunction.	3.5	1
000036 (BW/A08) / Fuel Handling Accident / 8						X	AA2.03	Ability to determine and interpret the following as they apply to the Fuel Handling incidents: Magnitude of potential radioactive release.	4.2	1
000056 / Loss of Off-site Power / 6						X	AA2.50	Ability to determine and interpret the following as they apply to the Loss of Offsite Power: That load and VAR limits, alarm setpoints, frequency and voltage limits for ED/Gs are not being exceeded.	3.1	1
BW/E13 & E14 / EOP Rules and Enclosures										
BW/A05 / Emergency Diesel Actuation / 6										
CE/A16 / Excess RCS Leakage / 2										
W/E13 / Steam Generator Over-pressure / 4										
W/E15 / Containment Flooding / 5										
K/A Category Point Totals:	0	0	0	0	0	3	Group Point Total:			3

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
001 Control Rod Drive					X							K4.10	Knowledge of CRDS design feature(s) and/or interlock(s) which provide for the following: Trip signals that would prevent reset of reactor trip signals.	3.8	1
001 Control Rod Drive						X						K5.96	Knowledge of the following operational implications as they apply to the CRDS: Sign changes (plus or minus) in reactivity, obtained when positive reactivities are added to negative reactivities.	3.4	1
003 Reactor Coolant Pump								X				A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPs controls including: RCP pump and motor bearing temperatures.	2.9	1
003 Reactor Coolant Pump								X				A1.10	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPs controls including: RCP standpipe levels.	2.7	1
004 Chemical and Volume Control									X			A2.10	Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Inadvertent boration/dilution.	4.2	1
004 Chemical and Volume Control									X			A2.35	Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Reactor trip.	3.8	1
013 Engineered Safety Features Actuation						X						K5.01	Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Definitions of safety train and ESF channel.	3.2	1
013 Engineered Safety Features Actuation				X								K3.03	Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Containment.	4.7	1
014 Rod Position Indication															
015 Nuclear Instrumentation					X							K4.07	Knowledge of NIS design feature(s) and/or interlock(s) provide for the following: Permissives.	3.8	1
015 Nuclear Instrumentation						X						K5.14	Knowledge of the operational implications of the following concepts as they apply to the NIS: Neutron flux density, definition and relation to reactor power.	3.1	1

SALEM NRC License Examination
 PWR SRO Written Examination Outline
 Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
017 In-Core Temperature Monitor	X											2.4.4	Emergency Procedures / Plan: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.3	1
022 Containment Cooling				X								K3.01	Knowledge of the effect that a loss or malfunction of the CCS will have on the following: Containment equipment subject to damage by high or low temperature, humidity, and pressure	3.2	1
025 Ice Condenser															
026 Containment Spray									X			A2.08	Ability to (a) predict the impacts of the following malfunctions or operations on the CSS; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Safe securing of containment spray when it can be done.	3.7	1
026 Containment Spray								X				A1.05	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including: Chemical Additive Tank level and concentration	3.4	1
056 Condensate System		X										K1.03	Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: MFW.	2.6	1
059 Main Feedwater															
061 Auxiliary/Emergency Feedwater	X											2.1.12	Conduct of Operations: Ability to apply technical specifications for a system	4.0	1
063 DC Electrical Distribution	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions	3.8	1
068 Liquid Radwaste															
071 Waste Gas Disposal										X		A3.03	Ability to monitor automatic operation of the Waste Gas Disposal System including: Radiation monitoring system alarm and actuating signals	3.8	1

SALEM NRC License Examination
 PWR SRO Written Examination Outline
 Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
072 Area Radiation Monitoring									X			A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the ARM system- and (b) based on those predictions, use procedures to correct, control, or mitigate those malfunctions or operations: Blown power-supply fuses.	2.9	1
K/A Category Point Totals:	3	1	0	2	2	3	0	3	4	1	0	Group Point Total:			19

SALEM NRC License Examination
 PWR SRO Written Examination Outline
 Plant Systems – Tier 2 Group 2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
002 Reactor Coolant						X						K5.11	Knowledge of the operational implications of the following concepts as they apply to the RCS: Relationship between effects of the primary coolant system and the secondary coolant system.	4.2	1
006 Emergency Core Cooling					X							K4.14	Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Cross connection of HPI/LPI SIP.	4.2	1
006 Emergency Core Cooling										X		A3.01	Ability to monitor automatic operation of the ECCS, including: Accumulators.	3.9	1
010 Pressurizer Pressure Control											X	A4.03	Ability to manually operate and/or monitor in the Control Room: PORV and block valves.	3.6	1
010 Pressurizer Pressure Control					X							K4.03	Knowledge of PZR PCS design feature(s) and/or interlock(s) which provide for the following: Over pressure control.	4.1	1
011 Pressurizer Level Control										X		A3.03	Ability to monitor automatic operation of the PZR LCS, including: Charging and letdown.	3.3	1
012 Reactor Protection		X										K1.02	Knowledge of the physical connections and/or cause effect relationships between the RPS and the following systems: 125V DC system.	3.7	1
016 Non-Nuclear Instrumentation				X								K3.07	Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: ECCS.	3.7	1
027 Containment Iodine Removal											X	A4.02	Ability to manually operate and/or monitor in the Control Room: Remote operating and handling of iodine filters.	3.0	1
028 Hydrogen Recombiner and Purge Control							X					K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: Hydrogen recombiners.	3.1	1
029 Containment Purge															
033 Spent Fuel Pool Cooling				X								K3.01	Knowledge of the effect that a loss or malfunction of the Spent Fuel Pool Cooling System will have on the following: Area ventilation systems.	3.1	1
034 Fuel Handling Equipment									X			A2.01	Ability to (a) predict the impacts of the following malfunctions or operations on the Fuel Handling System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Dropped fuel element	4.4	1
035 Steam Generator							X					K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the S/G's: MSIV's	3.6	1
039 Main and Reheat Steam															

SALEM NRC License Examination
 PWR SRO Written Examination Outline
 Plant Systems – Tier 2 Group 2

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
055 Condenser Air Removal															
062 AC Electrical Distribution			X									K2.01	Knowledge of bus power supplies to the following: major system loads	3.4	1
064 Emergency Diesel Generator							X					K6.07	Knowledge of the effect of a loss or malfunction of the following will have on the EDG system: Air receivers	2.9	1
073 Process Radiation Monitoring											X	A4.01	Ability to manually operate and/or monitor in the control room: Effluent release	3.9	1
075 Circulating Water									X			A2.03	Ability to (a) predict the impacts of the following malfunctions or operations on the Circulating Water System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Safety features and relationship between condenser vacuum, turbine trip, and steam dump.	2.7	1
079 Station Air															
086 Fire Protection															
103 Containment															
K/A Category Point Totals:	0	1	1	2	2	1	3	0	2	2	3	Group Point Total:			17

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
005 Residual Heat Removal															
007 Pressurizer Relief / Quench Tank															
008 Component Cooling Water			X									K2.02	Knowledge of bus power supplies to the following: CCW pump, including emergency backup	3.2	1
041 Steam Dump/Turbine Bypass Control					X							K4.18	Knowledge of SDS design feature(s) and/or interlock(s) which provide for the following: Turbine trip	3.6	1
045 Main Turbine Generator						X						K5.23	Knowledge of the operational implications of the following concepts as they apply to the MT/G System: Relationship between rod control and RCS boron concentration during T/G load increases.	2.8	1
076 Service Water															
078 Instrument Air					X							K4.03	Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Securing of SAS upon loss of cooling water.	3.3	1
K/A Category Point Totals:	0	0	1	0	2	1	0	0	0	0	0	Group Point Total:			4

Plant-Specific Priorities			
System / Topic	Recommended Replacement for...	Reason	Points
Steam Generator 035 K6.01	Main and Reheat Steam System 039 A2.02	Inadvertent MSIV closure identified as contributor to increased Core Damage Frequency in PRA*	1
AC Electrical Distribution 062 K2.01	Non-Nuclear Instrumentation 016 A2.03	AC Vital Bus outage is the greatest contributor to an increase in the probability of core damage frequency*	1
Main Feed Water 059 G2.4.11	Containment Spray 026 A2.08	Loss of Main Feed Water cited as event leading to core damage*	1
DC Electrical Distribution 063 G2.1.32	Reactor Coolant Pump 003 A2.02	DC Bus outage is a contributor to an increase in the probability of core damage frequency*	1
Containment Spray 026 A1.01	Containment Spray 026 A1.05	LER 311-01-003	1
Loss of Main Feedwater 000054 G2.4.18	Loss of Main Feedwater 000054 G2.2.22	Loss of Main Feed Water cited as event leading to core damage* – G2.2.22 does not apply at Salem	1
Pressurizer Vapor Space Accident 000008 A2.19	Pressurizer Vapor Space Accident 000008 A2.09	A2.09-No PZR spray block valves at Salem. A2.19-Event has occurred at Salem	1
Loss of Nuclear Service Water 000062 AK3.02	Loss of Nuclear Service Water 000062 AK3.04	AK3.04 has limited application at Salem. Loss of Nuclear Service Water considered a "Special Initiator" for Events Leading to Core Damage*	1
Loss of Component Cooling Water 000026 AK3.03	Loss of Nuclear Service Water 000062 AA2.04	Manual trip of RX and RCPs is a Salem Risk Significant Operator Action*	1
Steam Generator Tube Leak 000037 AK3.05	Steam Generator Tube Leak 000037 AA2.01	Significant procedure changes and training emphasis since Indian Point event	1
Plant-Specific Priority Total: (limit 10)			10

* Reference: SH.OP-AP.ZZ-0027, ON LINE RISK ASSESSMENT

Facility: Salem Units 1&2		Date of Exam: 11/02	Exam Level: SRO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.21	Ability to obtain and verify controlled procedure copy.	3.2	1
	2.1.12	Ability to apply technical specifications for a system.	4.0	1
	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	4.0	1
	Total			
Equipment Control	2.2.22	Knowledge of limiting conditions for operations and safety limits.	4.1	1
	2.2.33	Knowledge of control rod programming.	2.9	1
	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels.	3.5	1
	2.2.17	Knowledge of the process for managing maintenance activities during power operations.	3.0	1
	2.2.14	Knowledge of the process for making configuration changes.	3.0	1
	2.2.27	Knowledge of the refueling process.	3.5	1
	2.2.11	Knowledge of the process for controlling temporary changes.	3.4	1
Total				7
Radiation Control	2.3.8	Knowledge of the process for performing a planned gaseous radioactive release.	3.2	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	3.1	1
	2.3.2	Knowledge of facility ALARA program.	2.9	1
	2.3.1	Knowledge of 10CFR:20 and related facility radiation control requirements.	3.0	1
	Total			
Emergency Procedures / Plan	2.4.43	Knowledge of emergency communications systems and techniques.	3.5	1
	2.4.35	Knowledge of local auxiliary tasks during emergency operations including system geography and system implications.	3.5	1
	2.4.20	Knowledge of operational implications of EOP warnings, cautions, and notes.	4.0	1
	Total			
Tier 3 Point Total (SRO)				17

Facility: Salem Units 1&2 Examination Level: SRO(I)/SRO(U)		Date of Examination: 11/02 NRC Operating Test Number: GOLF
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	Shift Staffing JPM	2.1.4 (3.4) - Knowledge of shift staffing requirements Evaluate a shift staffing situation and take action IAW plant procedures
	Technical Specification Question	2.1.12 (4.0) – Ability to apply technical specifications for a system Determine the applicable TSAS(s) for failure of a radiation monitor in a system shared by both units (CAV)
	ECP/Criticality Question	2.1.23 (4.0) – Ability to perform specific system and integrated plant procedures during all modes of operation Given an Inverse Count Rate Ratio (ICRR) and the associated ECP, evaluate the situation and specify the required action(s)
A.2	Surveillance Procedure JPM	2.2.12 (3.4) – Knowledge of surveillance procedures Review (for approval) a completed surveillance procedure for a safety related component
A.3	Waste Release Permit JPM	2.3.6 (3.1) – Knowledge of the requirements for reviewing and approving release permits Review (for approval) a liquid or gaseous waste release permit
A.4	Emergency Classification JPM	2.4.41 (4.1) – Knowledge of emergency action level thresholds and classifications Following the simulator scenario in which the candidate filled the CRS position, classify the event and complete the Initial Contact Message Form within the required time

Facility: Salem Units 1 & 2

Date of Examination: 11/02

Exam Level: SRO(U)

Operating Test No.: SIM JPM Day 2

B.1: Control Room Systems

	System	JPM Description	Type Code*	Safety Function
S1	PZR Pressure (010)	Place POPS in service (SIM JPM DAY 2)	D,L	3
S2	ECCS (006)	Shift to Hot Leg Recirculation with 22 RHR Pump unavailable (SIM JPM DAY 2)	A,E,M	2
S3	CCS (022)	Take corrective action for a Service Water leak in a CFCU during a LOCA (SIM JPM DAY 2 – SROU ONLY)	A,D,E	5

B.2 Facility Walk-Through (ALL Candidates)

P1	AFW (061)	Align DM Water to the AFW Pump suction header	D,R	4
P2	APE (068)	LOCAL control of PZR heaters	E,D	8

* **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, (E)OP/AB

Facility: Salem Units 1 & 2

Date of Examination: 11/02

Exam Level: SROI

Operating Test No.: SIM JPM Day 2&3

B.1: Control Room Systems

	System	JPM Description	Type Code*	Safety Function
S1	Rod Control (001)	Dropped rod in Mode 2 (SIM JPM DAY 3)	L,N	1
S2	ECCS (006)	Shift to Hot Leg Recirculation with 22 RHR Pump unavailable (SIM JPM DAY 2)	A,E,M	2
S3	PZR Pressure (010)	Place POPS in service (SIM JPM DAY 2)	D,L	3
S4	AFW (061)	Establish AFW flow (SIM JPM DAY 3)	A,E,D	4
S5	CSS (026)	MANUAL Containment Spray actuation in FRCE-1 (SIM JPM DAY 3)	A,E,M	5
S6	EDG (064)	Start an EDG from the control room and energize a vital bus (SIM JPM DAY 2)	A,D,E	6
S7	CCW (008)	Shift operating CCW Pumps (SIM JPM DAY 2)	D	8

B.2 Facility Walk-Through (ALL Candidates)

P1	AFW (061)	Align DM Water to the AFW Pump suction header	D,R	4
P2	ESFAS (013)	De-energize all SEC's	E,D	2
P3	APE (068)	LOCAL control of PZR heaters	E,D	8

* **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, (E)OP/AB

Facility: Salem Units 1&2		Date of Exam: 11/02				Exam Level: RO							
Tier	Group	K/A Category Points											Point Totals
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	
1. Emergency & Abnormal Plant Evolutions	1	3	1	2				5	4			1	16
	2	3	1	3				5	4			1	17
	3	0	1	1				1	0			0	3
	Tier Totals	6	3	6				11	8			2	36
2. Plant Systems	1	1	1	2	2	5	0	2	3	3	0	4	23
	2	2	0	3	3	2	1	2	1	2	3	1	20
	3	0	1	0	2	1	1	0	0	1	2	0	8
	Tier Totals	3	2	5	7	8	2	4	4	6	5	5	51
3. Generic Knowledge and Abilities					Cat 1		Cat 2		Cat 3		Cat 4		13
					2		3		3		5		
<p>Note:</p> <ol style="list-style-type: none"> 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. 													

SALEM NRC License Examination
PWR RO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000005 / Inoperable/Stuck Control Rod / 1					X		AA1.05	Ability to operate and/or monitor the following as they apply to Inoperable/Stuck Rod: RPI	3.4	1
000015 / 17 / RCP Malfunctions / 4					X		AA1.09	Ability to operate and/or monitor the following as they apply to the Reactor Coolant Pump Malfunctions (Loss of RC flow): RCS temperature detection subsystem.	3.1	1
BW/E09; CE/A13; W/E09 & E10 / Natural Circ. / 4			X				EK2.2	Knowledge of the interrelations between the Natural Circulation Operations and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	3.6	1
BW/E09; CE/A13; W/E09 & E10 / Natural Circ. / 4					X		EA1.3	Ability to operate and/or monitor the following as they apply to the (Natural Circulation with Steam Void in Vessel with/without RVLIS): Desired operating results during abnormal and emergency situations.	3.4	1
000024 / Emergency Boration / 1		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to Emergency Boration: Relationship between boron addition and change in T-ave.	3.4	1
000026 / Loss of Component Cooling Water / 8				X			AK3.03	Knowledge of the reasons for the following responses as they apply to the Loss of Component Cooling Water: Guidance action contained in EOP for Loss of CCW	4.2	1
000027 / Pressurizer Pressure Control System Malfunction / 3						X	AA2.10	Ability to determine and interpret the following as they apply to the Pressurizer Pressure Control Malfunctions: PZR heater energized/de-energized condition.	3.3	1
000040 (BW/E05; CE/E05; W/E12) / Steam Line Rupture – Excessive Heat Transfer / 4					X		AA1.05	Ability to operate and/or monitor the following as they apply to the Steam Line Rupture: Manual and automatic RPS trip initiation.	4.5	1
CE/A11; W/E08/ RCS Overcooling – PTS / 4						X	EA2.1	Ability to determine and interpret the following as they apply to the (Pressurized Thermal Shock): Facility conditions and selection of appropriate procedures during abnormal and emergency operations.	3.4	1
000051 / Loss of Condenser Vacuum / 4										
000055 / Station Blackout / 6		X					EK1.01	Knowledge of the operational implications of the following concepts as they apply to the Station Blackout: Effect of battery discharge rates on capacity	3.3	1
000057 / Loss of Vital AC Elec. Inst. Bus / 6					X		AA1.06	Ability to operate and/or monitor the following as they apply to the Loss of Vital AC Instrument Bus: Manual control of components for which automatic control is lost	3.5	1
000062 / Loss of Nuclear Service Water / 4				X			AK3.02	Knowledge of the reasons for the following responses as they apply to the Loss of Nuclear Service Water: The automatic actions (alignments) within the nuclear service water resulting from the actuation of the ESFAS	3.6	1

SALEM NRC License Examination
PWR RO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 1

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000067 / Plant Fire On-site / 9						X	AA2.12	Ability to determine and interpret the following as they apply to the Plant Fire on Site: Location of vital equipment within fire zone.	2.9	1
000068 (BW/A06) / Control Room Evac. / 8										
000069 (W/E14) / Loss of CTMT Integrity / 5						X	AA2.02	Ability to determine and interpret the following as they apply to the Loss of Containment Integrity: Verification of automatic and manual means of restoring integrity.	3.9	1
000074 (W/E06 & E07) / Inad. Core Cooling / 4		X					EK1.2	Knowledge of the operational implications of the following concepts as they apply to the (Saturated Core Cooling): Normal, abnormal and emergency operating procedures associated with (Saturated Core Cooling).	3.1	1
BW/E03 / Inadequate Subcooling Margin / 4										
000076 / High Reactor Coolant Activity / 9	X						2.4.11	Knowledge of abnormal condition procedures	3.4	1
BW/A02 & A03 / Loss of NNI-X/Y / 7										
K/A Category Point Totals:	1	3	1	2	5	4	Group Point Total:			16

SALEM NRC License Examination
PWR RO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000001 / Continuous Rod Withdrawal / 1						X	AA2.04	Ability to determine and interpret the following as they apply to the Continuous Rod Withdrawal: Reactor power and its trend.	4.2	1
000003 / Dropped Control Rod / 1				X			AK3.08	Knowledge of the reasons for the following responses as they apply to the Dropped Control Rod: Criteria for inoperable control rods.	3.1	1
000007(BW/E02 &E10; CE/E02) / Reactor Trip – Stabilization – Recovery / 1					X		EA1.08	Ability to operate and monitor the following as they apply to a reactor trip: AFW System.	4.4	1
BW/A01 / Plant Runback / 1										
BW/A04 / Turbine Trip / 4										
000008 / Pressurizer Vapor Space Accident / 3						X	AA2.19	Ability to determine and interpret the following as they apply to the Pressurizer Vapor Space Accident: PZR spray valve failure, using plant parameters	3.4	1
000009 / Small Break LOCA / 3						X	EA2.30	Ability to determine or interpret the following as they apply to a small break LOCA: Tech Specs limits for plant operation with less than four loops.	2.5	1
000011 / Large Break LOCA / 3						X	EA2.07	Ability to determine or interpret the following as they apply to a Large Break LOCA: That equipment necessary for functioning of critical pump water seals is operable.	3.2	1
W/E04 / LOCA Outside Containment / 3										
BW/E08; W/E03 / LOCA Cooldown / Depress. / 4		X					EK1.3	Knowledge of the operational implications of the following concepts as they apply to LOCA Cooldown and Depressurization: Annunciators and conditions indicating signals, and remedial actions associated with the (LOCA Cooldown and Depressurization).	3.5	1
W/E11 / Loss of Emergency Coolant Recirc. / 4		X					EK1.2	Knowledge of the operational implications of the following concepts as they apply to the (Loss of Emergency Coolant Recirculation): Normal, abnormal and emergency operating procedures associated with (Loss of Emergency Coolant Recirculation).	3.6	1
WE/01 & 02 / Rediagnosis & SI Termination / 3			X				EK2.2	Knowledge of the interrelations between the Reactor Trip or Safety Injection/Rediagnosis and the following: Facility's heat removal systems, including primary coolant, emergency coolant, the decay heat removal systems, and relations between the proper operation of these systems to the operation of the facility.	3.5	1
000022 / Loss of Reactor Coolant Makeup / 2					X		AA1.08	Ability to operate and/or monitor the following as they apply to the Loss of Reactor Coolant Pump Makeup: VCT Level.	3.4	1
000025 / Loss of RHR System / 4										
000029 / Anticipated Transient w/o Scram / 1				X			EK3.01	Knowledge of the reasons for the following responses as they apply to the ATWS: Verifying a reactor trip; methods.	4.2	1

SALEM NRC License Examination
PWR RO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 2

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000032 / Loss of Source Range NI / 7										
000033 / Loss of Intermediate Range NI / 7										
000037 / Steam Generator Tube Leak / 3				X			AK3.05	Knowledge of the reasons for the following responses as they apply to the SG tube leak: Actions contained in procedures for radiation monitoring, RCS water inventory balance, SG tube failure, and plant shutdown	3.7	1
000038 / Steam Generator Tube Rupture / 3					X		EA1.11	Ability to operate and monitor the following as they apply to a SGTR: S/G level indicators.	3.8	1
000054 (CE/E06) / Loss of Main Feedwater / 4	X						2.4.20	Emergency Procedures/Plan: Knowledge of operational implications of EOP warnings, cautions and notes	3.3	1
BW/E04; W/E05 / Inadequate Heat Transfer – Loss of Secondary Heat Sink / 4					X		EA1.3	Ability to operate and/or monitor the following as they apply to the (Loss of Secondary Heat Sink): Desired operating results during abnormal and emergency situations.	3.8	1
000058 / Loss of DC Power / 8		X					AK1.01	Knowledge of the operational implications of the following concepts as they apply to Loss of DC Power: Battery charger equipment and instrumentation.	2.8	1
000059 / Accidental Liquid Radwaste Rel. / 9					X		AA1.02	Ability to operate and/or monitor the following as they apply to the Accidental Liquid Radwaste Release: ARM system.	3.3	1
000060 / Accidental Gaseous Radwaste Rel. / 9										
000061 / ARM System Alarms / 7										
W/E16 / High Containment Radiation / 9										
CE/E09 / Functional Recovery										
K/A Category Point Total:	1	3	1	3	5	4	Group Point Total:			17

SALEM NRC License Examination
PWR RO Written Examination Outline
Emergency and Abnormal Plant Evolutions – Tier 1 Group 3

E/APE #/Name/Safety Function	G	K1	K2	K3	A1	A2	Number	K/A Topic(s)	Imp.	Points
000028 / Pressurizer Level Malfunction / 2			X				AK2.02	Knowledge of the interrelations between the Pressurizer Level Control Malfunctions and the following: Sensors and detectors.	2.6	1
000036 (BW/A08) / Fuel Handling Accident / 8				X			AK3.02	Knowledge of the reasons for the following responses as they apply to the Fuel Handling Incidents: Interlocks associated with fuel handling equipment.	2.9	1
000056 / Loss of Off-site Power / 6										
000065 / Loss of Instrument Air / 8										
BW/E13 & E14 / EOP Rules and Enclosures										
BW/A07 / Flooding / 8										
CE/A16 / Excess RCS Leakage / 2										
W/E13 / Steam Generator Over-pressure / 4					X		EA1.3	Ability to operate and/or monitor the following as they apply to the (Steam Generator Overpressure): Desired operating results during abnormal and emergency situations.	3.1	1
W/E15 / Containment Flooding / 5										
K/A Category Point Totals:	0	0	1	1	1	0	Group Point Total:			3

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
001 Control Rod Drive					X							K4.10	Knowledge of CRDS design feature(s) and/or interlock(s) which provide for the following: Trip signals that would prevent reset of reactor trip signals.	3.6	1
001 Control Rod Drive						X						K5.96	Knowledge of the operational implications of the following concepts as they apply to the CRDS: Sign changes (plus or minus) in reactivity, obtained when positive reactivities are added to negative reactivities.	3.2	1
003 Reactor Coolant Pump								X				A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPs controls including: RCP pump and motor bearing temperatures.	2.9	1
003 Reactor Coolant Pump								X				A1.10	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the RCPs controls including: RCP standpipe levels.	2.5	1
004 Chemical and Volume Control									X			A2.35	Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Reactor trip.	3.3	1
004 Chemical and Volume Control									X			A2.10	Ability to (a) predict the impacts of the following malfunctions or operations on the CVCS; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Inadvertent boration/dilution.	3.9	1
013 Engineered Safety Features Actuation						X						K5.01	Knowledge of the operational implications of the following concepts as they apply to the ESFAS: Definitions of safety train and ESF channel.	2.8	1
013 Engineered Safety Features Actuation				X								K3.03	Knowledge of the effect that a loss or malfunction of the ESFAS will have on the following: Containment.	4.3	1
015 Nuclear Instrumentation					X							K4.07	Knowledge of NIS design feature(s) and/or interlock(s) provide for the following: Permissives.	3.7	1
015 Nuclear Instrumentation						X						K5.14	Knowledge of the operational implications of the following concepts as they apply to the NIS: Neutron flux density, definition and relation to reactor power.	3.8	1
017 In-Core Temperature Monitor										X		A3.02	Ability to monitor automatic operation of the ITM system including: Measurement of in-core thermocouple temperatures at panel outside Control Room.	3.4	1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
017 In-Core Temperature Monitor	X											2.4.4	Emergency Procedures / Plan: Ability to recognize abnormal indications for system operating parameters which are entry-level conditions for emergency and abnormal operating procedures.	4.0	1
022 Containment Cooling			X									K2.01	Knowledge of power supplies to the following: Containment cooling fans.	3.0	1
025 Ice Condenser															
056 Condensate		X										K1.03	Knowledge of the physical connections and/or cause-effect relationships between the Condensate System and the following systems: MFW.	2.6	1
059 Main Feedwater	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions.	3.4	1
059 Main Feedwater	X											2.4.11	Emergency Procedures/Plan: Knowledge of abnormal condition procedures	3.4	1
061 Auxiliary / Emergency Feedwater						X						K5.02	Knowledge of the operational implications of the following concepts as they apply to the AFW: Decay heat sources and magnitude.	3.2	1
061 Auxiliary / Emergency Feedwater										X		A3.01	Ability to monitor automatic operation of the AFW, including: AFW startup and flows.	4.1	1
068 Liquid Radwaste	X											2.4.31	Emergency Procedures / Plan: Knowledge of annunciators alarms and indications, and use of the response instructions.	3.3	1
068 Liquid Radwaste										X		A3.02	Ability to monitor automatic operation of the Liquid Radwaste System including: Automatic isolation.	3.6	1
071 Waste Gas Disposal									X			A2.09	Ability to (a) predict the impacts of the following malfunctions or operations on the waste Gas Disposal System; and (b) based on those predictions, use procedures to correct, control or mitigate the consequences of those malfunctions or operations: Stuck-open relief valve.	3.0	1
072 Area Radiation Monitoring				X								K3.02	Knowledge of the effect that a loss of malfunction of the ARM system will have on the following: Fuel handling operations.	3.1	1

SALEM NRC License Examination
 PWR RO Written Examination Outline
 Plant Systems – Tier 2 Group 1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
072 Area Radiation Monitoring						X						K5.02	Knowledge of the operational implications of the following concepts as they apply to the ARM system: Radiation intensity changes with source distance.	4.0	1
K/A Category Point Totals:	4	1	1	2	2	5	0	2	3	3	0	Group Point Total:			23

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
002 / Reactor Coolant						X						K5.11	Knowledge of the operational implications of the following concepts as they apply to the RCS: Relationship between effects of the primary coolant system and the secondary coolant system.	4.0	1
006 Emergency Core Cooling										X		A3.01	Ability to monitor automatic operation of the ECCS, including: Accumulators.	4.0	1
006 Emergency Core Cooling					X							K4.14	Knowledge of ECCS design feature(s) and/or interlock(s) which provide for the following: Cross connection of HPI/LPI SIP.	3.9	1
010 Pressurizer Pressure Control											X	A4.03	Ability to manually operate and/or monitor in the Control Room: PORV and block valves.	4.0	1
010 Pressurizer Pressure Control					X							K4.03	Knowledge of PZR PCS design feature(s) and/or interlock(s) which provide for the following: Over pressure control.	3.8	1
011 Pressurizer Level Control											X	A4.04	Ability to manually operate and/or monitor in the Control Room: Transfer of PZR LCS from automatic to manual control.	3.2	1
011 Pressurizer Level Control										X		A3.03	Ability to monitor automatic operation of the PZR LCS, including: Charging and letdown.	3.2	1
012 Reactor Protection		X										K1.02	Knowledge of the physical connections and/or cause effect relationships between the RPS and the following systems: 125V DC system.	3.4	1
014 Rod Position Indication															
016 Non-Nuclear Instrumentation				X								K3.07	Knowledge of the effect that a loss or malfunction of the NNIS will have on the following: ECCS	3.6	1
026 Containment Spray				X								K3.01	Knowledge of the effect that a loss or malfunction of the CSS will have on the following: CCS.	3.9	1
026 Containment Spray								X				A1.05	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the CSS controls including: Chemical Additive Tank level and concentration	3.1	1
029 Containment Purge															
033 Spent Fuel Pool Cooling								X				A1.02	Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with operating the SFPCS controls including: Radiation Monitoring Systems	2.8	1

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
035 Steam Generator							X					K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the S/Gs: MSIVs.	3.2	1
039 Main and Reheat Steam															
055 Condenser Air Removal				X								K3.01	Knowledge of the effect that a loss or malfunction of the CARS will have on the following: Main condenser.	2.5	1
062 AC Electrical Distribution		X										K1.04	Knowledge of the physical connections and/or cause-effect relationships between the AC distribution system and the following systems: Off-site power sources	4.2	1
063 DC Electrical Distribution	X											2.1.32	Conduct of Operations: Ability to explain and apply all system limits and precautions	3.8	1
064 Emergency Diesel Generator											X	A4.06	Ability to manually operate and/or monitor in the Control Room: Manual start, loading and stopping of the ED/G.	3.9	1
073 Process Radiation Monitoring						X						K5.03	Knowledge of the operational implications as they apply to concepts as they apply to the PRM system: Relationship between radiation intensity and exposure limits.	2.9	1
075 Circulating Water									X			A2.02	Ability to (a) predict the impacts of the following malfunctions or operations on the circulating water system; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: Loss of circulating water pumps.	2.5	1
079 Station Air															
086 Fire Protection					X							K4.05	Knowledge of design feature(s) and/or interlock(s) which provide for the following: Halon.	3.0	1
K/A Category Point Totals:	1	2	0	3	3	2	1	2	1	2	3	Group Point Total:			20

System #/Name	G	K1	K2	K3	K4	K5	K6	A1	A2	A3	A4	Number	K/A Topics	Imp.	Points
005 Residual Heat Removal															
007 Pressurizer Relief / Quench Tank															
008 Component Cooling Water			X									K2.02	Knowledge of bus power supplies to the following: CCW pump, including emergency backup.	3.0	1
027 Containment Iodine Removal											X	A4.02	Ability to manually operate and/or monitor in the Control Room: Remote operation and handling of Iodine filters.	2.8	1
028 Hydrogen Recombiner and Purge Control							X					K6.01	Knowledge of the effect of a loss or malfunction on the following will have on the HRPS: Hydrogen recombiners.	2.6	1
034 Fuel Handling Equipment											X	A4.01	Ability to manually operate and/or monitor in the Control Room: Radiation levels.	3.3	1
041 Steam Dump/Turbine Bypass Control					X							K4.18	Knowledge of SDS design feature(s) and/or interlock(s) which provide for the following: Turbine trip	3.4	1
045 Main Turbine Generator						X						K5.23	Knowledge of the operational implications of the following concepts as they apply to the MT/B System: Relationship between rod control and RCS boron concentration during T/G load increases.	2.7	1
045 Main Turbine Generator										X		A3.08	Ability to monitor automatic operation of the MT/G system, including: Determination from throttle and governor indicators of turbine trip: several indications, including CRDS trip alarm.	3.3	1
076 Service Water															
078 Instrument Air					X							K4.03	Knowledge of IAS design feature(s) and/or interlock(s) which provide for the following: Securing of SAS upon loss of cooling water.	3.1	1
103 Containment															
K/A Category Point Totals:	0	0	1	0	2	1	1	0	0	1	2	Group Point Total:			8

Plant-Specific Priorities			
System / Topic	Recommended Replacement for...	Reason	Points
AC Electrical Distribution 062 K1.04	Condenser Air Removal 055 K1.06	4KV Vital Bus outage is the greatest contributor to core damage frequency increase*	1
Main Feed Water 059 G2.4.11	Main Feed Water A3.07	Loss of Main Feed Water cited as event leading to core damage* – Salem does not have an ICS (A3.07)	1
Containment Spray 026 A1.01	Containment Spray 026 A1.05	LER 311-01-003	1
DC Electrical Distribution 063 G2.1.32	Spent Fuel Pool Cooling 033 K3.01	DC Bus outage is a contributor to an increase in the probability of core damage frequency*	1
Loss of Main Feedwater 000054 G2.4.20	Loss of Main Feedwater 000054 G2.2.22	Loss of Main Feed Water cited as event leading to core damage* – G2.2.22 does not apply at Salem	1
Pressurizer Vapor Space Accident 000008 A2.19	Pressurizer Vapor Space Accident 000008 A2.09	A2.09-No PZR spray block valves at Salem. A2.19-Event has occurred at Salem	1
Loss of Nuclear Service Water 000062 AK3.02	Loss of Nuclear Service Water 000062 AK3.04	AK3.04 has limited application at Salem. Loss of Nuclear Service Water considered a "Special Initiator" for Events Leading to Core Damage*	1
Loss of Component Cooling Water 000026 AK3.03	Inadequate Core Cooling 000074 EA1.03	Manual trip of RX and RCPs is identified as a Salem Risk Significant Operator Action*	1
Steam Generator Tube Leak 000037 AK3.05	High Containment Radiation E16 EK3.2	Significant procedure changes and training emphasis since Indian Point event	1
Plant-Specific Priority Total: (limit 10)			9

* Reference: SH.OP-AP.ZZ-0027, ON LINE RISK ASSESSMENT

Facility: Salem Units 1&2		Date of Exam: 11/02	Exam Level: RO	
Category	K/A #	Topic	Imp.	Points
Conduct of Operations	2.1.23	Ability to perform specific system and integrated plant procedures during all modes of plant operation.	3.9	1
	2.1.21	Ability to obtain and verify controlled procedure copy.	3.1	1
	Total			2
Equipment Control	2.2.33	Knowledge of control rod programming.	2.5	1
	2.2.11	Knowledge of the process for controlling temporary changes.	2.5	1
	2.2.22	Knowledge of limiting conditions for operations and safety limits.	3.4	1
	Total			3
Radiation Control	2.3.2	Knowledge of facility ALARA program.	2.5	1
	2.3.4	Knowledge of radiation exposure limits and contamination control, including permissible levels in excess of those authorized.	2.5	1
	2.3.1	Knowledge of 10CFR:20 and related facility radiation control requirements.	2.6	1
	Total			3
Emergency Procedures/Plan	2.4.8	Knowledge of how the event-based emergency/abnormal operating procedures are used in conjunction with the symptom-based EOPs.	3.0	1
	2.4.12	Knowledge of general operating crew responsibilities during emergency operations.	3.4	1
	2.4.45	Ability to prioritize and interpret the significance of each annunciator or alarm.	3.3	1
	2.4.32	Knowledge of operator response to loss of all annunciators.	3.3	1
	2.4.47	Ability to diagnose and recognize trends in an accurate and timely manner utilizing the appropriate control room reference material.	3.4	1
	Total			5
Tier 3 Point Total (RO)				13

Facility: Salem Units 1 & 2 Examination Level: RO		Date of Examination: 11/02 Operating Test Number: GOLF
Administrative Topic/Subject Description		Describe method of evaluation: 1. ONE Administrative JPM, OR 2. TWO Administrative Questions
A.1	ECP Verification JPM	2.1.25 (2.8) – Ability to obtain and interpret station reference materials such as graphs, monographs, and tables which contain performance data Perform a “peer check” on a completed (incorrect) ECP Form
	Shift Turnover/Log Review QUESTION	2.1.3 (3.0) – Knowledge of shift turnover practices Given a situation, determine the pre-relief and post-relief control room log review requirements
	Active license QUESTION	2.1.1 (3.7) – Knowledge of conduct of operations requirements Apply the facility requirements for re-activating an inactive reactor operator license
A.2	Tagging JPM	2.2.13 (3.6) – Knowledge of tagging and clearance procedures Close and tag a “normally open” MOV
A.3	Fuel Handling Accident JPM	2.3.10 (2.9) – Ability to perform procedures to reduce excessive levels of radiation and guard against personnel exposure Implement control room actions for a fuel handling incident IAW S2.OP-AB.FUEL-0001
A.4	ERDS QUESTION	2.4.39 (3.3) – Knowledge of RO’s responsibilities in emergency plan implementation Specify the minimum EAL and associated time limit for activating ERDS
	Critical Data Transmission QUESTION	2.4.39 (3.3) – Knowledge of RO’s responsibilities in emergency plan implementation Specify the data transmission requirements when SPDS is NOT available

Facility: Salem Units 1 & 2

Date of Examination: 11/02

Exam Level: RO

Operating Test No.: SIM JPM Day 1&3

B.1: Control Room Systems

	System	JPM Description	Type Code*	Safety Function
S1	Rod Control (001)	Dropped rod in Mode 2 (SIM JPM DAY 3)	L,N	1
S2	ECCS (006)	Shift to Hot Leg Recirculation with 21 RHR Pump unavailable (SIM JPM DAY 1)	A,E,M	2
S3	PZR Pressure (010)	Re-energize pressurizer heaters from the normal power supply (SIM JPM DAY 1)	A,E,D	3
S4	AFW (061)	Establish AFW flow (SIM JPM DAY 3)	A,E,D	4
S5	CSS (026)	MANUAL Containment Spray actuation in FRCE-1 (SIM JPM DAY 3)	A,E,M	5
S6	AC ELEC (062)	Restore power to a de-energized 4KV Vital Bus from a SPT (SIM JPM DAY 1)	N	6
S7	CCW (008)	Split the CCW Headers (SIM JPM DAY 1)	D	8

B.2 Facility Walk-Through (ALL Candidates)

P1	CVCS (004)	LOCAL control of charging flow	D,R	2
P2	MRSS (039)	Close a MSIV from the local control panel	E,D	4
P3	RPS (012)	Trip the reactor by locally opening the Reactor Trip Breakers and Rod Drive MG Set Breakers	E,D	7

* 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, (E)OP/AB

Facility: Salem Units 1 & 2	Scenario No.: NRC#1	Op Test No.: GOLF	
Examiners: _____	Candidates: _____	CRS	
_____	_____	RO	
_____	_____	PO	
<p>Objectives: In accordance with plant procedures: (a) begin a power increase at 5% per hour; (b) respond to a Tavq instrument failure (summer card); (c) respond to controlling PZR level channel failing high; (d) respond to loss of all "A" Circulators; (e) enter and properly execute the EOP network; (f) respond to a DBLOCA with failure of 2A SEC; (g) respond to loss of CL Recirculation capability due to sequential loss of both RHR Pumps.</p> <p>Initial Conditions: Snapped IC at 50% power with 22 SI Pump and 21B Circulator OOS.</p> <p>Turnover: The plant is in Mode 1 with power at 50%. 22 SI Pump and 21B Circulator are OOS. All other equipment is operating normally and major control systems are in AUTO. Orders for the shift are to raise power at 10% per hour.</p>			
Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N CRS N PO R RO	Raise power
2	RC0014A	I CRS/RO	Tavg instrument fails high (TS CRS)
3	PR0017A	I CRS/RO	Controlling PZR level channel fails high
4	EL0053	M ALL	Loss of Circulating Water Bus Section 23
5	RP0069 RP0073	C RO	AUTO and MANUAL Main Turbine trips fail
6A	RC0001A	M ALL	DBLOCA
6B	SI0184A	C ALL	21 SI Pump fails to start
7	RH0026A EL0145	C ALL	Sequential loss of both RHR Pumps
			Scenario termination upon completion of SI Flow reduction steps in 2-EOP-LOCA-5, LOSS OF EMERGENCY RECIRCULATION

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

SCENARIO SUMMARY (GOLF NRC-ESG#1)

The scenario begins with directions for power ascension at 5% per hour. 22 SI Pump is C/T for bearing replacement and 21B Circulator is C/T for screen repairs.

On cue from the Lead Evaluator, a Tavg instrument will fail high. The crew should respond IAW S2.OP-AB.ROD-0003, remove channel from service and implement the correct technical specification(s).

After the plant is stable, the controlling PZR level instrument fails high. The crew should respond IAW the console alarm procedure and select another channel for control.

Loss of Circulating Water Pump Bus Section 23 and/or lowering condenser vacuum will require a MANUAL reactor trip. The Main Turbine AUTO and MANUAL trips will fail resulting in a HI Steam Flow/LO-LOTavg SI. The RO will have to manually initiate Main Steam Line Isolation (MSLI). The crew should perform actions IAW EOP-TRIP-1. 21 SI Pump and 21 RHR Pump fail to start on the SEC signal. The crew should manually start 21 SI Pump to ensure one full train of ECCS equipment but 21 RHR Pump will not start. During TRIP-1 implementation, the crew should recognize and respond to a DBA LOCA. Two functional restoration procedures may be entered (FRTS-1, FRCE-1) but operator actions are minimal.

At the appropriate point, the crew will transition from TRIP-1 to LOCA-1. 2B 4KV Vital Bus will trip on electrical fault during the execution of LOCA-1, resulting in loss of cold leg recirculation capability. The crew should transition to LOCA-5 at the appropriate step. The Lead Evaluator can terminate the scenario at any point after the CS flow reduction steps have been completed.

Facility: Salem Units 1 & 2	Scenario No.: NRC#2	Op Test No.: GOLF
Examiners: _____	Candidates: _____	CRS
_____	_____	RO
_____	_____	PO

Objectives: In accordance with plant procedures: (a) respond to failure of the controlling PZR Pressure Channel; (b) respond to HI DISCHARGE FLOW alarm on RCP Thermal Barrier HX return line; (c) reduce power in response to loss of the second circulator on a water box; (d) initiate a reactor trip and stop all RCP's in response to loss of seal injection flow with no CCW flow through the thermal barrier HX; (e) enter and properly execute the EOP network; (f) initiate MANUAL SI in response to a SGTR; (g) take corrective action for failure of 2C SEC; (h) isolate the unaffected SG's in response to 21MS167 failure; (i) terminate the release via 23 AFW Pump

Initial Conditions: 100% power, 21 AFW Pump and 21A Circulator OOS

Turnover: Maintain 100% power. A power reduction is scheduled for later this shift in order to remove 21 SGFP from service. The OS is expecting a call from the OM and will inform you when to start.

Event No.	Malf. No.	Event Type*	Event Description
1	PR0016A	I RO, CRS	Pressurizer Pressure Channel I fails high (TS-CRS)
2	A617 OVLO	I RO, CRS	RCP Thermal Barrier HX CCW return flow detector fails high
3	CW0114B	C PO, CRS	21B Circulator Breaker trips
4	N/A	N PO, CRS R-RO	Power reduction
5	CV0208A	M ALL	Operating charging pump breaker trips open
6	SG0078A	M ALL	Coincident with reactor trip: SG tube leak progresses to rupture on 21SG
7	RP318	C ALL	Failure of 2C SEC
8	MS0092E	C PO, CRS	21MS167 fails to close
			Scenario termination after SDAFW Pump trip in SGTR-1

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

SCENARIO SUMMARY (GOLF NRC-ESG#2)

The crew assumes the watch with directions to maintain 100% power. A power reduction is scheduled for later this shift to allow replacement of an electronic component in the 21 SGFP speed control system. The OS is expecting a call from the OM and will inform them when to start the power reduction. Both 21 AFW Pump and 21A Circulator are OOS for maintenance.

On cue from the Lead Evaluator the controlling PZR pressure channel fails high. The crew should respond IAW S2.OP-AB.PZR-0001. When PZR PRESS control is returned to AUTO and on cue from the Lead Evaluator, a HI DISCHARGE FLOW alarm will actuate on the CCW section of the console. The crew will enter the alarm response procedure (ARP) and determine that the RCP Thermal Barrier HX CCW Return Valve (2CC131) should have closed. The RO should take manual control of 2CC131 and close it. Then the crew should enter S2.OP-AB.RCP-0001, RCP Malfunction.

On cue from the Lead Evaluator 21B Circulator breaker trips open. AB.CW-1 requires a power reduction because neither circulator is running on 21 Condenser. The crew should initiate a power reduction IAW S2.OP-IO.ZZ-0004 and/or S2.OP-AB.LOAD-0001.

On cue from the Lead Evaluator the operating charging pump trips, resulting in a loss of seal injection with no CCW flow through the thermal barrier HX's of all RCP's. The crew should initiate a manual reactor trip, stop all RCP's, enter EOP-TRIP-1 (TRIP-1) and then transition to TRIP-2. Coincident with the reactor trip, a progressive tube leak begins in 21 SG. The crew should recognize the tube leak, initiate a manual safety injection and then transition back to TRIP-1. 2C SEC fails to start loads when SI actuates. The crew should take the actions necessary to start 2C Vital Bus equipment. They will continue to the diagnostic section of TRIP-1 and transition to SGTR-1. The crew unsuccessfully attempts to close 21MS167 and therefore must close the other MS167's. The crew should trip the SDAFW Pump to terminate that release path.

The Lead Evaluator can terminate the scenario at any point after the SDAFW Pump is tripped.

Facility: Salem Units 1 & 2		Scenario No.: NRC#3		Op Test No.: GOLF	
Examiners: _____		Candidates: _____		CRS	
_____		_____		RO	
_____		_____		PO	
<p>Objectives: In accordance with plant procedures: (a) perform a rapid power reduction; (b) respond to a CCW leak; (c) respond to an RCS temperature instrument failure; (d) respond to a VCT level channel instrument failure; (e) TCAF an RPS failure; (f) enter and properly execute the EOP network (g) maintain an RCS heat sink.</p> <p>Initial Conditions: 100% power, 21A Circulator and 21 AFW Pump OOS</p> <p>Turnover: The crew will assume the watch with direction to maintain 100% power – awaiting an order from the OS to reduce power and begin turbine valve testing. Both 21 AFW Pump and 21A Circulator are OOS for maintenance.</p>					
Event No.	Malf. No.	Event Type*	Event Description		
1	N/A	R-RO N CRS,PO	System Operator directs rapid 10% load reduction due to a grid problem		
2	CC12A	C RO,CRS	Isolable CCW leak on a safeguards header (TS-CRS)		
3	RC0015D	I RO,CRS	RCS loop 24 Tc fails high (TS-CRS)		
4	CV0037	I RO,CRS	LT-112, VCT level channel failure		
5	EL0148 RP0058 RP0059A OVDI	M ALL	Loss of 2B Vital Instrument Bus AUTO reactor trip fails MANUAL Reactor Trip Switch fails Reactor Trip Breakers fail		
6	CN0086 AF0183	C PO,CRS	Rapid loss of condenser vacuum trips both SGFP's 23 AFW Pump OVSPD		
7	EL0145	M ALL	Loss of 2B 4KV Vital Bus (Loss of 22 AFW Pump)		
			Scenario termination upon initiation of feeding SG via a Condensate Pump or completion of RCS Feed and Bleed steps IAW EOP-FRHS-1		

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

SCENARIO SUMMARY (GOLF NRC-ESG#3)

The crew will assume the watch with direction to maintain 100% power – awaiting an order from the OS to reduce power and begin turbine valve testing. Both 21 AFW Pump and 21A Circulator are OOS for maintenance.

Shortly after the crew assumes the watch, the System Operator will call with directions to rapidly reduce load to 90% because of a component failure at the New Freedom Switching Station. When the plant is in a stable condition a leak develops in a CCW safeguards header. The crew should respond and isolate the leak IAW AB.CC-1, Component Cooling Abnormality.

When the CCW leak has been isolated, RCS loop 24 Tcold fails high. The crew should respond IAW AB.ROD-3, Continuous Rod Motion, remove the channel from service and return Rod Control to AUTO. While the associated bistables are being tripped LT-112, VCT level instrument fails high. The crew should respond IAW the related Alarm Response Procedure.

When the RCS loop 24 bistables are tripped and the VCT high level divert valve is aligned back to the VCT, 2B Vital Instrument Bus fails. This generates a reactor trip demand but the reactor does not trip automatically. The reactor will not trip until the RO opens 2E6D/2G6D during the EOP-TRIP-1 immediate actions. Coincident with the trip demand signal, a major condenser failure results in a trip of both SGFP's and the SDAFW Pump trips on overspeed.

Shortly after transitioning to EOP-TRIP-2, 2B 4KV Vital Bus trips on electrical fault resulting in loss of 22 AFW Pump. The crew should continue in EOP-TRIP-2 and transition to EOP-FRHS-1 when a RED PATH develops on the Heat Sink CFST.

The Lead Evaluator can terminate the scenario when feed has been established via a Condensate Pump or RCS Feed and Bleed has been initiated.

SCENARIO SUMMARY (GOLF NRC-SPARE ESG)

The scenario begins at 75% power with 22 SI Pump OOS for motor bearing replacement. The crew is directed to lower power to 60% at 10%/hour so that 21 SGFP can be removed from service for a control oil leak repair.

On cue from the Lead Evaluator, PT-505, Turbine First Stage Pressure Detector will fail low, causing continuous rod insertion. The crew should respond IAW S2.OP-AB.ROD-0003, Continuous Rod Motion, place rod control in MANUAL, perform other operations related to removing the channel from service and enter the correct technical specification.

After identification of the PT-505 related technical specifications, a leak will develop in 2 SW Bay. The crew should respond IAW S2.OP-AB.SW-0003, SW Bay Leak, shift the running SW Pumps, isolate the leak and enter the correct technical specification.

On cue from the lead evaluator one turbine governor valve will fail closed. The CRS should refer back to the load limitations specified in S2.OP-SO.TRB-0001, Turbine Generator Operation, and initiate a rapid load reduction to <30% power IAW S2.OP-AB.LOAD-0001, Rapid Load Reduction. During the load reduction the feedwater regulating valve on one of the SG's will fail closed. The CRS should direct a MANUAL reactor trip. Following the reactor trip a SBLOCA will ramp in and the crew should initiate a MANUAL SI. The path of EOP use is TRIP-1; TRIP-2; back to TRIP-1; LOCA-1; LOCA-2. Both IRNIS detectors are undercompensated requiring the RO to manually energize the SRNIS. In LOCA-2, the crew will begin a cooldown of the RCS. During the cooldown, a loss of off-site power will cause SEC Blackout loading. The crew will have to re-start ECCS loads.

The Lead Evaluator can terminate the scenario after the ECCS loads have been re-started.