

Facility: <u>Fort Calhoun Station</u>		Date of Examination: April 16, 2012
Examination Level: RO		Operating Test Number: 2012-01
Administrative Topic (see Note)	Type Code*	Describe activity to be performed
RA1: Conduct of Operations	N, R	Calculate the estimated critical boron concentration for a reactor startup (Per TDB-II worksheet and curves) K/A 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc (CFR: 41.10, 45.12) RO IR: 3.9
RA2: Conduct of Operations	N, R	Perform a Quadrant Power Tilt Calculation with Excore detectors operable and ERF inoperable per OI-NI-1 K/A 2.1.20 Ability to interpret and execute procedure steps (CFR: 41.10, 45.12) RO IR: 4.6
RA3: Equipment Control	N, R	Prepare a manual clearance for maintenance on component cooling water pump AC-3C. K/A 2.2.13 Knowledge of tagging and clearance procedures (CFR: 41.10, 45.13) RO IR: 4.1
RA4: Radiation Control	N, R	Determine whether to install shielding based on given dose rates and work times. K/A 2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 45.9, 45.10) RO IR: 3.2
Emergency Procedures/Plan		N/A
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when all 5 are required.		
* Type Codes & Criteria: (C)ontrol room, (S)imulator, or Class(R)oom (D)irect from bank (≤ 3 for ROs; ≤ 4 for SROs & RO retakes) (N)ew or (M)odified from bank (≥ 1) (P)revious 2 exams (≤ 1 ; randomly selected)		

Facility: Fort Calhoun Station
 Examination Level: SRO

Date of Examination: April 16, 2012
 Operating Test Number: 2012-01

Administrative Topic (see Note)	Type Code*	Describe activity to be performed
SA1: Conduct of Operations	N, R	Calculate amount of water and boric acid required to raise SIRWT level ten inches and maintain current SIRWT boric acid concentration. K/A 2.1.25 Ability to interpret reference materials, such as graphs, curves, tables, etc. (CFR: 43.5, 45.12) SRO IR: 4.2
SA2: Conduct of Operations (same as RA2)	N, R	Perform a Quadrant Power Tilt Calculation with Excore detectors operable and ERF inoperable per OI-NI-1 K/A 2.1.20 Ability to interpret and execute procedure steps (CFR: 43.5, 45.12) SRO IR: 4.6
SA3: Equipment Control	N, R	Review manual clearance for maintenance on component cooling water pump AC-3C. K/A 2.2.13 Knowledge of tagging and clearance procedures (CFR: 45.13) SRO IR: 4.3
SA4: Radiation Control	N, R	Determine whether to install shielding based on given dose rates and work times. K/A 2.3.12 Knowledge of radiological safety principles pertaining to licensed operator duties, such as containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc. (CFR: 45.9, 45.10) SRO IR: 3.7
SA5: Emergency Procedures/Plan	N, R	Determine Emergency Action Level for a given emergency. K/A 2.4.38 Ability to take actions called for in the facility emergency plan, including supporting or acting as emergency coordinator if required. (CFR: 43.5, 45.11) SRO IR: 4.4

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

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

Facility: <u>Fort Calhoun Station</u>		Date of Examination: April 16, 2012
Exam Level: RO		Operating Test No.: 2012-01
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
S-1: Swap pressurizer pressure mode from manual to automatic, followed by spurious actuation of PORV (block valve initially fails to close)	N, A, S	3
S-2: Engineered Safeguards Actuation Verification (A PPLS relay fails to actuate, requiring manual initiation of PPLS, and HPSI injection valves fail to open, requiring control room action to open)	N, EN, A, S	2
S-3: Place a containment cooling unit in service (VA-8A/VA-7C)	D, S	5
S-4: Place shutdown cooling in service per OI-SC-1, Att. 1	N, L, S	4P
S-5: Maintain S/G water levels during startup using AFW. (Loss of AFW, have to start a main feedwater pump to restore flow)	N, A, L, S	4S
S-6: Valve stroke time testing of containment pressure relief valve HCV-246B	N, S	8
S-7: Dilute to achieve desired boron concentration for desired critical rod height (an unexpected reactivity increase occurs, requiring securing of dilution)	N, A, L, S	1
S-8: Transfer non-vital buses 1A1 and 1A2 onto 345kV bus per AOP-32	N, S	6
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P-1: Respond to a steam bound AFW pump FW-6 (MDAFW pump)	D, E	4S
P-2: Rack down a non-remote equipped 4160V circuit breaker	N	6
P-3: Waste gas transfer from the vent header to the gas decay tank	D, A, R	9
<p>@ All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	

(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

Facility: <u>Fort Calhoun Station</u>		Date of Examination: April 16, 2012
Exam Level: SRO-I		Operating Test No.: 2012-01
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
S-1: Swap pressurizer pressure mode from manual to automatic, followed by spurious actuation of PORV (block valve initially fails to close)	N, A, S	3
S-2: Engineered Safeguards Actuation Verification (A PPLS relay fails to actuate, requiring manual initiation of PPLS, and HPSI injection valves fail to open, requiring control room action to open)	N, EN, A, S	2
S-3: Place a containment cooling unit in service (VA-8A/VA-7C)	D, S	5
S-5: Maintain S/G water levels during startup using AFW. (Loss of AFW, have to start a main feedwater pump to restore flow)	N, A, L, S	4S
S-6: Valve stroke time testing of containment pressure relief valve HCV-246B	N, S	8
S-7: Dilute to achieve desired boron concentration for desired critical rod height (an unexpected reactivity increase occurs, requiring securing of dilution)	N, A, L, S	1
S-8: Transfer non-vital buses 1A1 and 1A2 onto 345kV bus per AOP-32	N, S	6
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P-1: Respond to a steam bound AFW pump FW-6 (MDAFW pump)	D, E	4S
P-2: Rack down a non-remote equipped 4160V circuit breaker	N	6
P-3: Waste gas transfer from the vent header to the gas decay tank	D, A, R	9
<p>[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	

(A)lternate path	4-6 / 4-6 / 2-3
(C)ontrol room	
(D)irect from bank	$\leq 9 / \leq 8 / \leq 4$
(E)mergency or abnormal in-plant	$\geq 1 / \geq 1 / \geq 1$
(EN)gineered safety feature	- / - / ≥ 1 (control room system)
(L)ow-Power / Shutdown	$\geq 1 / \geq 1 / \geq 1$
(N)ew or (M)odified from bank including 1(A)	$\geq 2 / \geq 2 / \geq 1$
(P)revious 2 exams	$\leq 3 / \leq 3 / \leq 2$ (randomly selected)
(R)CA	$\geq 1 / \geq 1 / \geq 1$
(S)imulator	

Facility: <u>Fort Calhoun Station</u>		Date of Examination: April 16, 2012
Exam Level: SRO-U		Operating Test No.: 2012-01
Control Room Systems [@] (8 for RO); (7 for SRO-I); (2 or 3 for SRO-U, including 1 ESF)		
System / JPM Title	Type Code*	Safety Function
S-1: Swap pressurizer pressure mode from manual to automatic, followed by spurious actuation of PORV (block valve initially fails to close)	N, A, S	3
S-2: Engineered Safeguards Actuation Verification (A PPLS relay fails to actuate, requiring manual initiation of PPLS, and HPSI injection valves fail to open, requiring control room action to open)	N, EN, A, S	2
S-7: Dilute to achieve desired boron concentration for desired critical rod height (an unexpected reactivity increase occurs, requiring securing of dilution)	N, A, L, S	1
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
P-1: Respond to a steam bound AFW pump FW-6 (MDAFW pump)	D, E	4S
P-3: Waste gas transfer from the vent header to the gas decay tank	D, A, R	9
<p>[@] All RO and SRO-I control room (and in-plant) systems must be different and serve different safety functions; all 5 SRO-U systems must serve different safety functions; in-plant systems and functions may overlap those tested in the control room.</p>		
* Type Codes	Criteria for RO / SRO-I / SRO-U	
(A)lternate path	4-6 / 4-6 / 2-3	
(C)ontrol room		
(D)irect from bank	≤ 9 / ≤ 8 / ≤ 4	
(E)mergency or abnormal in-plant	≥ 1 / ≥ 1 / ≥ 1	
(EN)gineered safety feature	- / - / ≥ 1 (control room system)	
(L)ow-Power / Shutdown	≥ 1 / ≥ 1 / ≥ 1	
(N)ew or (M)odified from bank including 1(A)	≥ 2 / ≥ 2 / ≥ 1	
(P)revious 2 exams	≤ 3 / ≤ 3 / ≤ 2 (randomly selected)	
(R)CA	≥ 1 / ≥ 1 / ≥ 1	
(S)imulator		

Facility: <u>Fort Calhoun Station</u> Scenario No.: <u>2</u> Revision <u>1</u> Op-Test No.: _____			
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: <u>100% power. Condensate pump FW-2B is currently in service</u> _____			

Turnover: _____ Rotate condensate pumps FW-2B and FW-2C.			
Event No.	Malf. No.	Event Type*	Event Description
1	N/A	N-BOPO	Rotate condensate pumps FW-2B and FW-2C per OI-FW-1 Attachment 4.
2		C-ATCO TS-CRS	Charging pump CH1B trips. Alarm CB-1,2,3/A2, Window A-6L. This isolates letdown. Another charging pump should be started per OI-CH-1. T.S. 2.15(5) applies because it requires CH-1B and other instruments for AI-179 (Alt shutdown panel)
3		I-BOPO	LT-903Y (Steam generator RC-1 level transmitter) degrades over a 10 minute period until it fails. This will shift FWCS to manual at the last good signal, requiring operator action to restore level. Alarm is ARP-DCS-FW, L0903E_AL5.
4		I-ATCO TS-CRS	Pressurizer pressure instrument fails high. Possible TS 2.10.4(5) if pressure falls below 2075 psia. Uses ARP-CB-1,2,3/A4 Window B-4 Pressurizer Pressure Deviation
5		C-ATCO C-BOPO TS-CRS	Dropped CEA 4-01. Alarm CB-4/A8 Window A-5L. This will send the operators to AOP-02, which has actions to stabilize the plant. TS 2.10.2(4)(e) Section III applies because the rod is dropped, this will require a rapid down-power per AOP-05.
6	N/A	R-ATCO N-BOPO	Rapid down-power per AOP-05.
7		M-All	RCP Seal Cooler Leak of CVC16. Due to high RCP temperatures, AOP-35 will be entered. AOP-35 will direct the operators to trip the reactor and enter EOP-00. This is an intersystem LOCA. EOP-03 will be entered after SPTA's are performed. TS 2.1.4(3) applies but is not counted because it is part of the major event and per the NUREG may be over-shadowed by it.
8		C-BOPO (CT)	Turbine fails to trip. Critical task is for BOP to immediately trip the turbine before performing other SPTA's
9		C-ATCO C-BOPO (CT)	HCV-438C fails to close on demand. This LOCA cannot be isolated. It will require a cooldown and depressurization to stop the LOCA. Critical task is to lower RCS pressure before attempting to locally close HCV-438C.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description
NRC Scenario #2

SCENARIO SUMMARY NRC #2

The crew will assume the watch at 100% power with no equipment out of service and instructions to swap condensate pumps FW-2B and FW-2C.

The first event is swapping out the two condensate pumps per OI-FW-1, CONDENSATE SYSTEM NORMAL OPERATION, Attachment 4.

The next event is a trip of charging pump CH-1B, which secures charging flow. Operator actions are per ARP-CB-1,2,3/A2 and include securing letdown. Operator action is then to restore charging and letdown per OI-CH-1, CHEMICAL AND VOLUME CONTROL SYSTEM NORMAL OPERATION. SRO will refer to the Technical Specification. **T.S. 2.15(5)** applies for the loss of CH-1B.

The next event is a degradation of LT-903Y to 40% over a 10 minute period before failing low, resulting in an incorrect setting on the feedwater digital control system. Operator actions are per ARP-DCS-FW, L0903E_AL5 and include the operator taking manual control of the main feed regulating valve to restore steam generator levels to program.

The next event is the controlling pressurizer pressure instrument, PT-103X failing high. Operator actions are per ARP-CB-1,2,3/A4 and include taking the controller to manual to maintain pressurizer pressure, and shifting pressure control to PC-103Y. SRO will refer to Technical Specifications. **T.S. 2.10.4(5)(a)(ii)** applies if pressure falls below 2075 psia.

The next event is a CEA drop of CEA 4-01. Operator actions are per ARP-CB-4/A8 and AOP-02, CEA AND CONTROL SYSTEM MALFUNCTIONS and include stabilizing the plant and taking action to lower reactor power to less than or equal to 70% ΔT within 1 hour per AOP-5, EMERGENCY SHUTDOWN. SRO will refer to Technical Specifications. **T.S. 2.10.2(4)(e)** applies.

Once actions have been taken to start lowering reactor power to less than 70%, a 100% severity RCP seal cooler leak on CVC 16 will be cued. Operator actions are from ARP-CB-1,2,3/A1 and AOP-35, REACTOR COOLANT PUMP MALFUNCTIONS. At this time one of the bearing temperatures will exceed the trip criteria for the RCP. Operators will manually trip the reactor and enter EOP-00. They will also trip the RCP whose trip criteria was exceeded (RCP 3A).

When the operators manually trip the reactor, the turbine will fail to trip and the operators will take action to manually trip the turbine (**critical task**). After actions of EOP-00 are complete, the SRO will direct entry into EOP-03 for a loss of coolant accident.

When operators attempt to isolate the leak by closing HCV-438C, it fails to close. Operators must commence a cooldown and depressurization prior to sending a local operator to close this valve (**critical task**). TS 2.1.4(3) applies but is not counted because it is part of the major event and per the NUREG may be over-shadowed by it.

The scenario can be terminated once actions have begun to cooldown and depressurize the RCS to allow local operator action to close HCV-438C.

Facility: <u>Fort Calhoun Station</u> Scenario No.: <u>3</u> Revision <u>1</u> Op-Test No.: _____			
Examiners: _____		Operators: _____	
_____		_____	
_____		_____	
Initial Conditions: <u>Reactor is currently at approximately 90% power. I&C is currently troubleshooting the power range NI power supply. Technical Specification 2.15(1) was entered at 0428 today. Trip units 1, 2, 9, 10, and 12 are currently in BYPASS for channel A.</u>			
Turnover: <u>The plant entered TS 2.0.1 due to a condition affecting both diesel generators. A plant shutdown was initiated. After power had been reduced to 90%, the condition was resolved and TS 2.0.1 was exited. You have been directed to maintain power at 90% until the Reactor Engineer prepares PAPERs guidance for power ascension back to 100% power.</u>			
Event No.	Malf. No.	Event Type*	Event Description
1		R-ATCO N-BOPO	Maintain power at 90%.
2		C-BOPO	Instrument Air Compressor CA-1C fails. Standby compressor CA-1B running but not loaded. Alarm is ARP-CB-10,11/A11 Window B-3L. No entry into AOP-17.
3		TS-CRS I-ATCO	Channel B power range NI summing amplifier fails low. T.S. 2.15(1) was already entered due to bypassed trip units 1, 2, 9, 10, 12 and these must be placed in trip per T.S. 2.15(2) . Also, per T.S. Table 2-2 note C, power must be reduced to less than 70%. AOP-15.
4		C-BOPO	Heater Drain Pump FW-5B trips, standby fails to autostart. Alarm is ARP-CB-10,11/A12 Window A-4L. Actions are required to start the standby pump.
5		TS-CRS	RCS oxygen levels are greater than 0.20 ppm, causing entry into T.S. 2.1.5(1) .
6		C-ATCO	Raw water pump AC-10D trips, standby fails to autostart. Alarm is ARP-CB-1,2,3/A1 Window D1U. Also, alarms CB-1,2,3/A1 C1U and C1L will come in shortly after pump trip.
7		C-BOPO	Loss of MCC 3C2 due to a ground fault. This causes a loss of boric acid pump CH-4A, boric acid gravity feed line valve HCV-265, and boric acid pumps discharge valve HCV-268. Alarm: CB-4/A7 "Boric Acid Valves Trouble." AOP-32
8		M-ALL (CT)	ATWS – RPS pressurizer pressure channel D/PIA-102Y fails low, causing 2 out of 3 for TM/LP but no RPS trip. Critical task is for ATCO to manually trip the reactor before performing any other actions.

9		C-ATCO (CT)	Following manual trip, 5 control rods fail to insert. This will require emergency boration. However, HCV-258 is mechanically bound when the operators attempt to open it. This results in the inability to emergency borate using the BASTs and requires use of the SIRWT to emergency borate. EOP-20. Critical task is to open LCV-218-3, Charging pump suction SIRWT isol. Valve, close LCV-218-2, VCT Outlet valve, and starting all charging pumps prior to exiting that safety function success path.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description NRC Scenario #3

SCENARIO SUMMARY NRC #3

The crew assumes the watch with the reactor at 90% power. Trip units 1, 2, 9, 10, and 12 for channel A are in BYPASS due to troubleshooting efforts. The crew instructions are to maintain power at 90%.

The first event is a trip of instrument air compressor CA-1C. The standby is running but unloaded. Operator actions are per ARP-CB-10,11/A7 and include starting the CS air compressor.

The next event is a failure of the B channel power range NI summing amplifier. Operator action is to place the channel in the tripped position within one hour and downpower to less than 70% per T.S. 2.15(2) and Table 2-2 Note C. SRO will refer to Technical Specifications. **T.S. 2.15(2)** applies as does Note C of Table 2-2.

The next event is a trip of heater drain pump FW-5B. Backup heater drain pump will not start automatically. Operator will need to start the backup pump.

The next event is a high oxygen concentration in the RCS of 0.20 ppm, which is called in by chemistry. No operator action. SRO will refer to Technical Specifications. **T.S. 2.1.5(1)** applies.

The next event is a trip of raw water pump AC-10D. Backup raw water pump will not start automatically. Operator will need to start backup pump.

The next event is a loss of MCC 3C2 due to a ground fault. Operator action is per ARP-CB-4/A7 and AOP-32, LOSS OF 4160 VOLT OR 480 VOLT BUS POWER and includes operating the primary water booster pump and steam generator blowdown transfer pump as necessary. SRO will refer to Technical Specifications (T.S. 2.7.2(g) for loss of MCC-3C2 is under review by NRR TS branch and was not included as part of the exam grading criteria).

The D channel for RPS pressurizer pressure then fails low, resulting in a 2 out of 3 trip logic for TM/LP, but no reactor trip has occurred. The crew is expected to recognize that an RPS actuation was required, and take action to manually trip the reactor (**critical task**).

When the operator manually trips the reactor, five CEA's fail to insert requiring emergency boration, which is unsuccessful due to HCV-258 failure to open. Following completion of standard post trip actions, SRO directs entry into EOP-20, FUNCTIONAL RECOVERY, Success Path RC-2. The crew will initiate boration using the SIRWT (**critical task**).

Once the crew has initiated boration using the SIRWT, the scenario can be terminated.

Facility: Fort Calhoun Station Scenario No.: 4 Revision 1 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: Mode 2 <1% power. Next step in OP-2A is to start 1 MFW pump. Desired MFW pump is FW-4B.

Turnover: Continue in OP-2A to raise power and load turbine. All requirements to transition to Mode 1 in OP-4 have been met.

Event No.	Malf. No.	Event Type*	Event Description
1		N-BOPO	Start MFW pump FW-4B per OP-2A, Attachment 3. Attachment 2 contains local operator actions and the instructions for starting the lube oil pump.
2		R-ATCO	Raise reactor power to 10% per OP-2A.
3		C-ATCO TS-CRS	Wide range log NI-002 fails high. This failure should occur when the ATC has raised power sufficient to see reactor response and when directed by lead examiner. ARP-CB-4/A20, Windows B-7 and C-1. This will send the operators to AOP-15, where they are directed to secure from raising power and stabilize reactor. T.S. 2.15(1) applies for failure of NI.
4		C-BOPO	MFW pump FW-4B trips, no auto start of standby pump. Alarm is ARP-CB-10,11/A12.
5		C-ATCO	Controlling pressurizer level instrument 101X fails low. Alarm is ARP-CB-1,k2,3/A4 Windows A-8 and C-8
6		C-ATCO TS-CRS	CCW pump AC-3A trips, no autostart of standby pump. Alarm is ARP-CB-1,2,3/A2 Window D-3U. T.S. 2.4(1)b applies.
7		C-BOPO TS-CRS (CT)	Inadvertent AFAS. AOP-28 for inadvertent AFAS. T.S.2.5.(1)D and TS 2.15(3) apply. Critical task is to recognize the AFAS is inadvertent and take action to mitigate (stop feeding the steam generators with AFW)
8		M-ALL	Steam line break inside containment on RC-2A. EOP-00 to EOP-05.
9		C-BOPO (CT)	SGIS fails. Critical task will be for BOPO to isolate steam generator before exiting procedure step.
10		C-ATCO (CT)	Containment spray pump 3B fails to autostart but can be started from control panel. Containment spray pump 3A shaft shears. Critical task is to restore containment spray flow by either starting containment spray pump 3C or 3B.
* (N)ormal, (R)eactivity, (I)nstrument, (C)omponent, (M)ajor			

Scenario Event Description
NRC Scenario #4

SCENARIO SUMMARY NRC #4

The crew assumes the watch with the reactor is Mode 2 at less than 1% reactor power. The crew instructions are to start main feedwater pump FW-4B and continue with power ascension.

The first event is to start a main feedwater pump per OP-2A, PLANT STARTUP, Attachment 3.

The next event is to raise reactor power to 10% per OP-2A. Once a reactivity effect is seen on the reactor, the next event will be cued.

The next event is a failure of wide range logarithmic NI-002 high. Operator action is per CB-4/A20 and AOP-15, and includes securing from the power ascension and stabilizing the reactor. SRO will refer to Technical Specifications. **T.S. 2.15(1)** applies.

The next event is a trip of main feedwater pump FW-4B with no autostart of the standby pump. Operator actions are per ARP-CB-10,11/A12 and include starting the standby pump, setting the post SIAS feedwater pump to FW-4C, and selecting a new standby pump.

The next event is a failure of controlling pressurizer level instrument 101X low. Operator actions are per ARP-CB-1,2,3/A4 and include placing the pressurizer level control switch to channel Y and placing the pressurizer heater cutout channel select switch to channel Y.

The next event is a trip of CCW pump AC-3A with no autostart of the standby pump. Operator actions are per ARP-CB-1,2,3/A2 and include starting the standby CCW pump. SRO will review Technical Specifications. **T.S. 2.4(1)b** applies.

The next event is an inadvertent auxiliary feedwater actuation signal. Operator actions are per AOP-28, AUXILIARY FEEDWATER SYSTEM MALFUNCTIONS and include actions to stop the aux feed and bypass the affected AFAS signal (**critical task**). SRO will refer to Technical Specifications. **T.S.'s 2.5(1)D and 2.15(3)** apply.

After this event a steam line break occurs inside containment on RC-2A. The crew will enter EOP-00 and perform standard post trip actions. Automatic SGIS fails and the crew should recognize this and take action to manually isolate the steam generators (**critical task**).

Once the containment spray is actuated, containment spray pump 3A shaft shears and pump 3B fails to automatically start. The crew should recognize that they do not have any containment spray and take actions to start containment spray pump 3B, or containment spray pump 3C (**critical task**), and they might close one of the containment spray head valves.

Once the crew has successfully isolated the steam generator and restored containment spray, the scenario may be terminated.

Facility: Fort Calhoun Station Scenario No.: 1 (Spare) Revision 1 Op-Test No.: _____

Examiners: _____ Operators: _____

Initial Conditions: 100% power, diesel generator #1 is tagged out for maintenance.

Turnover: Reduce power to <95% per grid operator.

Event No.	Malf. No.	Event Type*	Event Description
1		R-ATCO N-BOPO N-CRS	Reduce power to <95% per OP-4, Attachment 2.
2		I-ATCO TS-CRS	PIC-244 fails, causing HCV-204 (Letdown heat exchanger isolation valve) to close. Alarms are for VCT level low and Pressurizer level high (CB-1,2,3/A2 Window B-2 and CB-1,2,3/A4 Window A-8). If pressurizer level goes >69.2%, TS 2.1.7 applies.
3		C-ATCO C-BOPO	HCV-153 opens, causing quench tank level to decrease. Alarm is CB-1,2,3/A4 Window C-3. Action will be to restore level and close HCV-153
4		C-BOPO TS-CRS (CT)	Inadvertent VIAS. AOP-23 Section IV. TS 2.15(3) applies. Critical task is to reset relays that tripped and reset the inadvertent VIAS actuation.
5		C-BOPO TS-CRS	Loss of 161 kV line. Alarm is CB-20/A15, Window A-1, 4160V Supply Breaker from 161KV Tripped, also Windows A-2 and A-3. Since a fast transfer will occur, the ARP states to go to AOP-31. TS 2.7(2)c and TS 2.01 BOTH apply.
6		M-All	Loss of 345kV line (LOOP) Reactor trips, SRO enters EOP-00 and after SPTA's, transfers to EOP-07, due to below failure. Upon operator manually closing breaker, power will be restored to one vital bus.
7		C-BOPO (CT)	AFW valve HCV-1108A remains closed. It can be opened from the control panel. EOP-07 Step 6.1. Critical task is to restore AFW flow using either FW-54 or FW-10 to steam generator RC-2B prior to reaching 27% wide range level.
8		C-BOPO (CT)	Diesel Generator #2 breaker fails to close automatically due to diesel not reaching rated speed. When operators increase governor, the output breaker will close once breaker synch conditions are met. See Step 12 of EOP-07. Critical task is to perform this action before exiting EOP-07.

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

Scenario Event Description NRC Scenario #1

SCENARIO SUMMARY NRC #1

The crew will assume the watch at 100% power, with diesel generator #1 out of service for maintenance, and instructions to downpower to less than 95% per OP-4, LOAD CHANGE AND NORMAL POWER OPERATION, Attachment 2, "Load Reduction".

The first event is the power reduction which will continue until an observable effect on the reactor is seen (approximately 1-2% load reduction).

The next event is a failure of PIC-244 which senses pressure downstream of letdown backpressure control valve. This causes letdown to isolate. Operator actions are per ARP-CB-1,2,3/A2 and require securing charging flow. Operators will use OI-CH-1, CHEMICAL AND VOLUME CONTROL SYSTEM NORMAL OPERATION, to restore letdown and charging after manually overriding the HCV-204 Interlock Override Switch in DEFEAT. SRO will refer to Technical Specifications. **T.S. 2.1.7** might apply if pressurizer level goes above 69.2%.

The next event is a spurious opening of HCV-153, quench tank drain valve, causing quench tank level to decrease. Operator actions are per ARP-CB-1,2,3/A4 and include closing HCV-153 and taking action to restore quench tank level using deaerated water.

The next event is an inadvertent ventilation isolation actuation signal. Operator actions are per ARP-AI-30B/A34-1 and AOP-23 and include verifying that the VIAS was inadvertent and taking actions to reset the relays and reset the actuation (these two steps are **critical tasks**). The SRO will refer to Technical Specifications. **T.S. 2.15(3)** applies.

The next event is a loss of the 161 KV line. Operator actions are per ARP-CB-20/A15 and AOP-31, 161 KV GRID MALFUNCTIONS and include establishing balanced 4160 V bus loading by ensuring that condensate pump FW-2A, feed pump FW-4A and heater drain pump FW-5A are operating. SRO will refer to Technical Specifications. **T.S. 2.7.2(c) and TS 2.01** both apply.

Once actions for the loss of the 161 KV line are complete, there will be a loss of the 345 KV line, resulting in a LOOP. Diesel generator #2 does not reach rated speed and breaker does not automatically close, causing a station blackout. Crew will enter EOP-00 and perform standard post trip actions. Following diagnosis of event, SRO will transition to EOP-07, STATION BLACKOUT.

While performing the actions for a station blackout, the crew should recognize that HCV-1108A failed to open and will must restore AFW flow to the RC-2A steam generator (**critical task**). The crew will also take actions to raise the governor speed for diesel generator #2, which will result in the breaker closing automatically (**critical task**). Once this occurs and diesel generator #2 is feeding its respective bus, the scenario will be terminated.

Facility: Fort Calhoun Station		Date of Exam: 16 April 2012															
Tier	Group	RO K/A Category Points											SRO-Only Points				
		K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G *	Total	A2	G*	Total	
1. Emergency & Abnormal Plant Evolutions	1	3	3	3	N/A			2	3	N/A			4	18	3	3	6
	2	1	1	2	N/A			2	1	N/A			2	9	1	3	4
	Tier Totals	4	4	5	N/A			4	4	N/A			6	27	4	6	10
2. Plant Systems	1	4	3	3	2	1	2	3	3	3	2	2	28	2	3	5	
	2	0	0	0	1	2	1	2	1	1	2	0	10	1	1	3	
	Tier Totals	4	3	3	3	3	3	5	4	4	4	2	38	4	4	8	
3. Generic Knowledge and Abilities Categories					1	2	3	4	10			1	2	3	4	7	
					3	2	2	3				2	2	1	2		

- Note:
- Ensure that at least two topics from every applicable K/A category are sampled within each tier of the RO and SRO-only outlines (i.e., except for one category in Tier 3 of the SRO-only outline, the "Tier Totals" in each K/A category shall not be less than two).
 - 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 RO exam must total 75 points and the SRO-only exam must total 25 points.
 - Systems/evolutions within each group are identified on the associated outline; systems or evolutions that do not apply at the facility should be deleted and justified; operationally important, site-specific systems/evolutions that are not included on the outline should be added. Refer to Section D.1.b of ES-401 for guidance regarding the elimination of inappropriate K/A statements.
 - Select topics from as many systems and evolutions as possible; sample every system or evolution in the group before selecting a second topic for any system or evolution.
 - Absent a plant-specific priority, only those K/As having an importance rating (IR) of 2.5 or higher shall be selected. Use the RO and SRO ratings for the RO and SRO-only portions, respectively.
 - Select SRO topics for Tiers 1 and 2 from the shaded systems and K/A categories.
 - * The generic (G) 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. Refer to Section D.1.b of ES-401 for the applicable K/As.
 - On the following pages, enter the K/A numbers, a brief description of each topic, the topics' importance ratings (IRs) for the applicable license level, and the point totals (#) for each system and category. Enter the group and tier totals for each category in the table above; if fuel handling equipment is sampled in other than Category A2 or G* on the SRO-only exam, enter it on the left side of Column A2 for Tier 2, Group 2 (Note #1 does not apply). Use duplicate pages for RO and SRO-only exams.
 - For Tier 3, select topics from Section 2 of the K/A catalog, and enter the K/A numbers, descriptions, IRs, and point totals (#) on Form ES-401-3. Limit SRO selections to K/As that are linked to 10 CFR 55.43.

000038 Steam Gen. Tube Rupture / 3			X			Knowledge of the reasons for the following responses as they apply to the SGTR: EK3.06 Actions contained in EOP for RCS water inventory balance, S/G tube rupture, and plant shutdown procedures (CFR: 41.5, 41.10, 45.6, 45.13)	4.2	44
000040 (BW/E05; CE/E05; W/E12) Steam Line Rupture - Excessive Heat Transfer / 4					X	2.1.28 Knowledge of the purpose and function of major system components and controls (CFR: 41.7)	4.1	50
000054 (CE/E06) Loss of Main Feedwater / 4			X			Knowledge of the reasons for the following responses as they apply to the Loss of Feedwater: EK3.4 RO or SRO function within the control room team as appropriate to the assigned position, in such a way that procedures are adhered to and the limitations in the facilities license and amendments are not violated. (CFR: 41.5, 41.10, 45.6, 45.13)	3.2	53
000055 Station Blackout / 6			X			Knowledge of the reasons for the following responses as they apply to the SBO: EK3.02 Actions contained in EOP for loss of offsite and onsite power (CFR: 41.5, 41.10, 45.6, 45.13)	4.3	39
000056 Loss of Off-site Power / 6					X	Ability to determine and interpret the following as they apply to the Loss of Offsite Power: AA2.54 Breaker position (remote and local) (CFR: 43.5, 45.13)	2.9	48
000057 Loss of Vital AC Inst. Bus / 6					X	2.2.37 Ability to determine operability and/or availability of safety related equipment. (CFR: 41.7, 43.5, 45.12)	3.6	49
000058 Loss of DC Power / 6					X	Ability to operate and / or monitor the following as they apply to the Loss of DC Power: AA1.01 Cross-tie of the affected dc bus with the alternate supply (CFR: 41.7, 45.5, 45.6)	3.4*	55
000062 Loss of Nuclear Svc Water / 4								
000065 Loss of Instrument Air / 8					X	Ability to determine and interpret the following as they apply to the Loss of Instrument Air: AA2.08 Failure modes of air-operated equipment (CFR: 43.5, 45.13)	2.9*	45
W/E04 LOCA Outside Containment / 3								
W/E11 Loss of Emergency Coolant Recirc. / 4								
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4								

000077 Generator Voltage and Electric Grid Disturbances / 6	X						Knowledge of the operational implications of the following concepts as they apply to Generator Voltage and Electric Grid Disturbances: AK1.03 Under-excitation (CFR: 41.4, 41.5, 41.7, 41.10, 45.8)	3.3	56
K/A Category Totals:	3	3	3	2	3	4	Group Point Total:		18/6

ES-401	PWR Examination Outline Plant Systems - Tier 2/Group 1 (RO / SRO)											Form ES-401-2		
System # / Name	K 1	K 2	K 3	K 4	K 5	K 6	A 1	A 2	A 3	A 4	G	K/A Topic(s)	IR	#
003 Reactor Coolant Pump				X	X							<p>Knowledge of RCPS design feature(s) and/or interlocks(s) which provide for the following:</p> <p>K4.04 Adequate cooling of RCP motor and seals. (CFR: 41.7)</p>	2.8	1
												<p>Knowledge of the operational implications of the following concepts as they apply to the RCPS:</p> <p>K5.01 The relationship between the RCPS flow rate and the nuclear reactor core operating parameters (quadrant power tilt, imbalance, DNB rate, local power density, difference in loop T-hot pressure) (CFR: 41.5, 45.7)</p>	3.3	20
004 Chemical and Volume Control								X				<p>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:</p> <p>A2.15 High or low PZR level (CFR: 41.5, 43.5, 45.3, 45.5)</p>	3.5	2
											X	<p>2.1.20 Ability to interpret and execute procedure steps (CFR: 41.10, 43.5, 45.11)</p>	4.6	10
005 Residual Heat Removal		X	X									<p>Knowledge of the bus power supplies to the following:</p> <p>K2.03 RCS pressure boundary motor-operated valves. (CFR: 41.7)</p>	2.7*	5
												<p>Knowledge of the effect that a loss or malfunction of the RHRS will have on the following:</p> <p>K3.01 RCS (CFR: 41.7, 45.6)</p>	3.9	9

063 DC Electrical Distribution	X													X	Knowledge of the physical connections and/or cause-effect relationships between the DC electrical system and the following systems: K1.02 AC electrical system (CFR: 41.2 to 41.9, 45.7, 45.8) Ability to manually operate and/or monitor in the control room: A4.03 Battery discharge rate (CFR: 41.7, 45.5 to 45.8)	2.7 3.0*	14 28
064 Emergency Diesel Generator	X														Knowledge of the physical connections and/or cause-effect relationships between the ED/G system and the following systems: K1.03 Diesel fuel oil supply system (CFR: 41.2 to 41.9, 45.7, 45.8)	3.6	8
073 Process Radiation Monitoring				X											Knowledge of PRM system design feature(s) and/or interlock(s) which provide for the following: K4.01 Release termination when radiation exceeds setpoint. (CFR: 41.7)	4.0	16
076 Service Water		X												X	Knowledge of bus power supplies to the following: K2.01 Service water (CFR: 41.7) 2.4.4 Ability to recognize abnormal indications for system operating parameters that are entry-level conditions for emergency and abnormal operating procedures. (CFR: 41.10, 43.2, 45.6)	2.7* 4.5	25 21
078 Instrument Air	X														Knowledge of the physical connections and/or cause-effect relationships between the IAS and the following systems: K1.03 Containment air (CFR: 41.2 to 41.9, 45.7, 45.8)	3.3*	15
103 Containment			X												Knowledge of the effect that a loss or malfunction of the containment system will have on the following: K3.02 Loss of containment integrity under normal operations (CFR: 41.7)	3.8	22
K/A Category Point Totals:	4	3	3	2	1	2	3	3	3	3	2	2			Group Point Total:		28/5

033 Spent Fuel Pool Cooling									X						Ability to (a) predict the impacts of the following malfunctions or operations on the Spent Fuel Pool Cooling System; and (b) based on those predictions, use procedures to correct, control, or mitigate the consequences of those malfunctions or operations: A2.02 Loss of SFPCS (CFR: 41.5, 43.5, 45.3, 45.13)	2.7	34
034 Fuel Handling Equipment																	
035 Steam Generator				X											Knowledge of operational implications of the following concepts as they apply to the S/GS: K5.03 Shrink and swell concept. (CFR: 41.5, 45.7)	2.8	30
041 Steam Dump/Turbine Bypass Control																	
045 Main Turbine Generator																	
055 Condenser Air Removal																	
056 Condensate																	
068 Liquid Radwaste																	
071 Waste Gas Disposal																	
072 Area Radiation Monitoring										X					Ability to manually operate and/or monitor in the control room: A4.01 Alarm and interlock setpoint checks and adjustments (CFR: 41.7, 45.5-45.8)	3.0*	33
075 Circulating Water				X											Knowledge of circulating water system design feature(s) and interlock(s) which provide for the following: K4.01 Heat sink (CFR: 41.7, 45.6)	2.5	36
079 Station Air																	
086 Fire Protection								X							Ability to predict and/or monitor changes in parameters (to prevent exceeding design limits) associated with Fire Protection System operating the controls including: A1.01 Fire header pressure (CFR: 41.5, 45.5)	2.9	29
K/A Category Point Totals:	0	0	0	1	2	1	2	1	1	2	0	Group Point Total:		10/3			

000058 Loss of DC Power / 6										
000062 Loss of Nuclear Svc Water / 4										
000065 Loss of Instrument Air / 8										
W/E04 LOCA Outside Containment / 3										
W/E11 Loss of Emergency Coolant Recirc. / 4										
BW/E04; W/E05 Inadequate Heat Transfer - Loss of Secondary Heat Sink / 4										
000077 Generator Voltage and Electric Grid Disturbances / 6										
K/A Category Totals:					3	3	Group Point Total:			18/6

CE/A16 Excess RCS Leakage / 2					X	Ability to determine and interpret the following as they apply to the (Excess RCS Leakage) AA2.1 Facility conditions and selection of appropriate procedures during abnormal and emergency operations. (CFR: 43.5, 45.13)	3.5	85
CE/E09 Functional Recovery								
K/A Category Point Totals:					1	3	Group Point Total:	9/4

063 DC Electrical Distribution																
064 Emergency Diesel Generator													X	2.2.42 Ability to recognize system parameters that are entry level conditions for Technical Specifications (CFR: 43.2, 43.3)	4.6	90
073 Process Radiation Monitoring																
076 Service Water																
078 Instrument Air																
103 Containment																
K/A Category Point Totals:									2				3	Group Point Total:		28/5

075 Circulating Water																		
079 Station Air																		
086 Fire Protection																		
K/A Category Point Totals:				1					1								1	Group Point Total:
																	10/3	

Facility:		Date of Exam:				
Category	K/A #	Topic	RO		SRO-Only	
			IR	#	IR	#
1. Conduct of Operations	2.1.3	Knowledge of shift or short term relief turnover practices. (CFR: 41.10, 45.13)	3.7	74		
	2.1.4	Knowledge of individual licensed operator responsibilities related to shift staffing, such as medical requirements, "no-solo" operation, maintenance of active license status, 10CFR55, etc. (CFR: 41.10, 43.2)	3.3	72		
	2.1.15	Knowledge of administrative requirements for temporary management directives, such as standing orders, night orders, Operations memos, etc. (CFR: 41.10, 45.12)	2.7	68		
	2.1.35	Knowledge of the fuel-handling responsibilities of SROs. (CFR: 41.10, 43.7)			3.9	94
	2.1.37	Knowledge of procedures, guidelines, or limitations associated with reactivity management. (CFR: 41.1, 43.6, 45.6)			4.6	95
	Subtotal				3	2
2. Equipment Control	2.2.2	Ability to manipulate the console controls as required to operate the facility between shutdown and designated power levels. (CFR: 41.6, 41.7, 45.2)	4.6	67		
	2.2.13	Knowledge of tagging and clearance procedures (CFR: 41.10, 43.5, 45.13)	4.1	69		
	2.2.6	Knowledge of the process for making changes to procedures. (CFR: 41.10, 43.3, 45.13)			3.6	96
	2.2.12	Knowledge of Surveillance Procedures (CFR: 41.7, 41.10, 43.1, 45.13)			4.2	97
	2.2.					
	2.2.					
	Subtotal				2	2
	2.3.					

3. Radiation Control	2.3.11	Ability to control radiation releases. (CFR: 41.11, 43.4, 45.10)	3.8	71		
	2.3.13	Knowledge of radiological safety procedures pertaining to licensed operator duties, such as response to radiation monitor alarms, containment entry requirements, fuel handling responsibilities, access to locked high-radiation areas, aligning filters, etc.	3.4	66		
	2.3.4	Knowledge of radiation exposure limits under normal or emergency conditions. (CFR: 43.4)			3.7	98
	2.3.					
	2.3.					
	Subtotal				2	
4. Emergency Procedures / Plan	2.4.13	Knowledge of crew roles and responsibilities during EOP usage. (CFR: 41.10, 45.12)	4.0	73		
	2.4.37	Knowledge of the lines of authority during implementation of the emergency plan. (CFR: 41.10, 45.13)	3.0	75		
	2.4.17	2.4.17 Knowledge of EOP terms and definitions. (CFR: 41.10, 45.13)	3.9	70		
	2.4.8	Knowledge of how abnormal operating procedures are used in conjunction with EOPs. (CFR: 41.10, 43.5, 45.13)			4.5	99
	2.4.9	Knowledge of low power / shutdown implications in accident (e.g. Loss of coolant accident loss of residual heat removal) mitigation strategies. (CFR: 41.10, 43.5, 45.13)			4.2	100
	2.4.					
	Subtotal				3	
Tier 3 Point Total				10		7

Tier / Group	Randomly Selected K/A	Reason for Rejection
1/1	APE 022 AK2.01-2.06	No importance rating ≥ 2.5 . Randomly replaced with AA1.01.
1/1	APE 27 AK2.01, AK2.02, AK2.04, AK2.05	Importance rating not ≥ 2.5 . Randomly replaced with AK2.03.
1/1	EPE 38 EK2.01-2.07	Importance rating not ≥ 2.5 . Randomly replaced with EK 3.07.
1/1	EPE 38 EK3.07	FCS does not have loop isolation valves. Randomly replaced with EK 3.04.
1/2	APE 28 AK3.04	At FCS, Program Tave not constant with power change. Randomly replaced with AK 3.05.
2/1	003 K4.05	Importance rating not ≥ 2.5 . Randomly replaced with K 4.04.
2/1	003 A2.02	Resample to obtain required (by NUREG-1021) sample of category K5. Replaced with K 5.04.
2/1	006 K6.04 K6.16	Importance rating not ≥ 2.5 . Randomly replaced with K 6.03.
2/1	007 K4.02 K4.03	Importance rating not ≥ 2.5 . Randomly replaced with K 4.01.
2/1	022 K6.01 – K6.08	Importance rating not ≥ 2.5 . Replaced with A 4.05 to help maintain even distribution between categories.
2/1	026 A2.06	Importance rating not ≥ 2.5 . Randomly replaced with A 2.05.
2/1	026 A2.01 A2.05	At FCS, reflux boiling pressure spike when first going on recirculation is not an expected plant response (A2.01). Also, FCS does not have chemical addition tanks (A2.05). Randomly replaced with A 2.04.
2/1	059 K5	No importance rating ≥ 2.5 . Randomly replaced with A 1.07.
2/1	059 A1.07	FCS does not have a turbine driven MFW pump. Randomly replaced with A 1.03.
2/1	062 A1.02 A1.05	Importance rating not ≥ 2.5 . Randomly replaced with A 1.01.
2/1	063 K1.04	Importance rating not ≥ 2.5 . Randomly replaced with K 1.02.
2/1	073 K4.02	FCS does not have automatic letdown isolation on high RCS activity. Randomly replaced with K 4.01.
2/2	014 A4	Resample to obtain required (by NUREG-1021) sample of category K5. Replaced with K 5.01.
2/2	014 K5.01 K5.02	Not part of FCS design. No other K5 has importance rating ≥ 2.5 . Replaced with A 4.02.

2/2	027	K2.01	FCS does not have this system. Randomly reselected Steam Generator system, K 5.03 to replace.
2/2	034	K5	Importance rating not ≥ 2.5 . Randomly replaced with A 3.03.
2/2	034	A3.03	FCS does not have a high flux at shutdown alarm. Replaced with A 3.02.
2/2	075	K5	Importance rating not ≥ 2.5 . Randomly replaced with K3.07.
2/2	075	K3.07	At FCS, no connection between circulating water system and ESFAS. No other K3 has importance rating ≥ 2.5 , so randomly replaced with K 4.01.
2/1	004	A2.09	Cannot write a discriminating question using RO knowledge for this K/A (uses GFE knowledge). Randomly replaced with A2.15
2/1	103	2.4.41	Cannot write a question using RO knowledge for this K/A (tests SRO-only knowledge). Randomly replaced with generic K/A 2.1.20
2/2	001	K5.20	Cannot write a question using RO knowledge for this K/A (tests GFE knowledge). Replaced with K5.28
1/1	EPE38	EK3.04	Resampled for better distribution. Too many questions on PRM's. Replaced with EK3.02
2/1	003	K5.04	Cannot write a question using RO knowledge for this K/A (tests GFE knowledge). Replaced with K5.01
2/1	008	A3.06	Cannot write a discriminating question using RO knowledge. Replaced with A3.04
2/1	103	K3.03	Cannot write a question using RO knowledge (SRO-only level). Replaced with K3.02
2/2	029	K1.03	Resampled for better question distribution. Too many containment questions. Replaced with 001 K5.20
2/2	001	K5.20	Cannot write discriminating question using RO knowledge. Replaced with K5.28
2/2	068	A2.04	Resampled for better question distribution. Too many liquid radwaste questions. Replaced with 002 K6.03
2/2	041	A4.07	FCS does not remote gag stuck open relief valves. Replaced with A4.08
2/2	086	A1.04	Cannot write discriminating RO question. Replaced with A1.01
1/1	038	EK3.02	Cannot write discriminating RO question. Resample to EK3.06.
1/2	00040	2.2.42	Cannot write RO knowledge question. Replaced with 2.1.28
1/2	000057	2.2.40	Cannot write RO knowledge question, SRO-only knowledge. Replaced with 2.2.37.
1/2	000069	AK1.01	Already had a question on pressure vs. leak rate. Resampled to obtain better K/A distribution and issue distribution (already questioned containment integrity). Replaced with 000068 AA2.06.
3	2.3.7		This K/A is being tested as an administrative JPM. Randomly replaced with 2.3.13.

2/2	0410000 A4.08	This system underwent major revisions during the outage, but post modification cannot be completed until plant restarts, and procedures are still in draft. Therefore, cannot write a question based on this as the modification is still outstanding, and resampled to 072000 Area Radiation Monitoring A4.01.
1/2	000076 AK3.05	This K/A was rejected due to concerns about the quality of the procedure associated with the K/A
1/1	0065 A2.07	This KA was rejected because this topic was already used on another question (ie handjacking of raw water valves). Reselected A2.08 in its place.
2/1	0007 K4.01	This KA was rejected because this topic was already used on another question (Q22). Reselected A1.02 in its place.
3	2.2.20	This KA was rejected because it was too difficult to write RO knowledge question on troubleshooting activities. Reselected 2.2.13 for Knowledge of tagging and clearance procedures.
3	2.4.42	This KA was rejected because there was not enough material content in FCS procedures to write a question at the RO level. We asked them about this and they stated that ROs do not do anything for the E-plan or the Emergency facilities such as TSC, etc. Selected new KA of 2.4.17 Knowledge of EOP terms and definitions.
Tier / Group SRO only	Randomly Selected K/A SRO only	Reason for Rejection (SRO only)
1 / 1		Q76 change 000008 Pressurizer Vapor Space Accident / 3 KaA2.05 rejected since not capable of writing SRO only question from this selection. Reselected new topic and K/A, 000009 Small Break LOCA - EA2.36
1 / 1		Q77 change 000015/17 RCP Malfunctions - AA2.08 rejected since not capable of writing SRO only question from this selection. Reselected new topic and K/A, CE/E05 Steam Line Rupture - Excessive Heat Transfer EA2.1
1 / 1		Q78 change 000022 Loss of RCS makeup –G2.4.21, changed topic and kept K/A since not capable of writing SRO only question from this selection. Reselected new topic, 0025 Loss of RHR
1 / 1		Q79 change 000029 ATWS EA2.05 rejected since not capable of writing SRO only question from this selection. Reselected new topic and K/A, 0038 SGTR, EA2.14

1 / 1		Q 81 change 000077 Generator Voltage and Electric Grid Disturbances / 6, K/A G2.4.46 , rejected since not capable of writing SRO only question from this selection. Reselected new topic and K/A, 000055 Station Blackout / 6 K/A 2.4.8
1 / 2		Q 82 change 000028 Pressurizer Level malfunction, K/A G2.4.9 , rejected since not capable of writing SRO only question from this selection. Reselected new topic and K/A, 000005 Inoperable/Stuck Control Rod, K/A 2.2.37
1 / 2		Q 83 change 000068 Control Room Evac, K/A A2.09, rejected since not capable of writing SRO only question from this selection. Reselected new topic and K/A, 000069 Containment Integrity, K/A 2.2.40
2 / 1		Q 86 change 006 Emergency Core Cooling, K/A 2.4.34 changed K/A to 2.2.5 in order to balance CFR distribution. There were no CFR 43.3 topics selected for plant mods.
2 / 1		Q 89 change 022.A2.04 topic used on last exam as a JPM. Resampled and used 008.A2.03 (CCW hi/low Temperature)
2 / 1		Q 90 change 064 EDG, K/A A2.19 changed K/A to G2.2.21 in order to balance CFR distribution. There were no CFR 43.2 topics
2 / 2		Q 92 change 045 Main TG, K/AG2.1.27 rejected since not capable of writing SRO only question from this selection. Reselected new topic and K/A, 00027 Containment iodine Removal, K/A G 2.4.6 Knowledge of EOP mitigation strategies.
3		Q98 change G2.3.5 K/A not SRO only topic, changed to G2.3.14.
3		Q 96 change G2.2.21 K/A already sampled for SRO in question 90. Changed to G2.2.22
3		Q 97 change G2.2.38 K/A not discriminating for SRO only question. Changed to G2.2.12
1/1		Q 80 K/A 2.2.22 N/A for 000054 Loss of Main Feedwater. Changed to 000056 Loss of Off-site Power (same K/A)