

Simulation Facility	<u>Byron</u>	Scenario	Operating Test No.: 2012 NRC Exam	
Examiners:		No.: NRC 10-1		
	_____	Applicant:	_____	SRO
	_____		_____	RO
	_____		_____	BOP
Initial Conditions:	IC-18			
Turnover:	Unit 1 is at 76% power, steady state, equilibrium xenon, MOL with control rods in manual. RCS boron concentration is 950 ppm. Online risk is green.. 0 CC pump is mechanically and electrically aligned to Unit 2 due to OOS on 2B CC pump.			

Event No.	Malf. No.	Event Type*	Event Description
Preload	IMF FW35C IRF CC42 RO IMF RP15A MRF RP83 OPEN TRGSET 2 ZLO1SI01PB(3) = = 1 IMF CV01B (2 0)		1C HD pump Trip/fail to start 0 CC pump aligned to bus 242 1A CV pump auto start failure 1B CV pump trip
1	IMF PA0253 ON IOR ZDI1MS018A CLS	TS (US)	SG PORV 1MS018A inoperable (Tech Spec)
2	IMF RX13A 0 15	I (RO, US) TS (US)	Pressurizer level channel 1LT-459 fails low (Tech Spec)
3	IMF RX03B 4.8 30	I (BOP, US)	Steam flow channel 1FI-513A fails high
4	IMF FW35A	C (BOP, US)	1A Heater Drain Pump trip.
4a.	None	N (BOP) R (RO, US)	Runback Main Turbine
5	IMF CV03	C (RO, US) TS (US)	Boric acid transfer pump trip.
6	IMF RX05 1500	I (BOP, US)	PT-507 fails high
7	IMF TH03A 350	M (ALL)	Ruptured 1A SG
8	Preload	C (RO, US)	1B CV pump trips/1A CV pump fails to auto start.

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

SCENARIO OVERVIEW

Unit 1 is at 76% power, steady state, equilibrium xenon, MOL with control rods in manual. RCS boron concentration is 950 ppm. Online risk is green. 0 CC pump is mechanically and electrically aligned to Unit 2 due to OOS on 2B CC pump.

After completing shift turnover and relief, steam generator 1A atmospheric relief valve 1MS018A, will develop a hydraulic leak. The Unit Supervisor will enter Tech Spec 3.7.4, Condition A and Tech Spec 3.6.3, Condition C. The crew will dispatch an operator to close 1MS019A to comply with TS 3.6.3, condition C. 1MS018A will remain unavailable for the remainder of the scenario. On line risk remains green.

After the 1MS018A failure has been addressed, the controlling pressurizer level channel will fail low. Letdown will automatically isolate and the RO will take manual control of charging flow. 1BOA INST 2, OPERATION WITH A FAILED INSTRUMENT CHANNEL, Attachment C, will be implemented. The RO will restore pressurizer level control to automatic after letdown is reestablished and pressurizer level is restored to normal. Technical specification 3.3.1 conditions A and K will be entered. On line risk remains green.

After the pressurizer level channel failure has been addressed, the controlling steam flow channel on the 1A SG fails high. The BOP will take manual control of feedwater flow. 1BOA INST 2, OPERATION WITH A FAILED INSTRUMENT CHANNEL, Attachment H, will be implemented. The BOP will restore feedwater flow control to automatic when SG level is restored to normal. On line risk remains green.

After the feedwater flow channel failure has been addressed, 1A Heater Drain Pump will trip. 1BOA SEC-1, SECONDARY PUMP TRIP, Attachment C, will be entered. The BOP will attempt a start of the 1C HDP but it will not start. The BOP will then initiate a turbine load reduction to 780 MW at 20 MW/minute. The RO will borate the RCS as necessary to stabilize RCS temperature. On line risk remains green.

While borating in response to the 1A Heater Drain Pump trip, the Unit 1 Boric Acid pump motor bearing will seize while the pump is running. MCC 133X3, cubicle A4 will open, causing a trip of the Unit 1 Boric Acid Transfer Pump. The crew will align the Unit 0 Boric Acid Transfer Pump to Unit 1 per BOP AB-17, UNIT 0 BORIC ACID TRANSFER PUMP OPERATIONS step F.1.

After the Boric Acid Transfer Pump alignment is complete, 1PT507 will Fail High. This will require the BOP to take manual control of TDFW pump speed. Actions will be directed by BAR 1-15-A-D 9 (SG Level deviation Hi/Lo)

After the PT-507 failure and Boric Acid Pump trip have been addressed, the 1A SG will develop a 350 gpm SGTR. The crew will implement 1BEP-0, REACTOR TRIP OR SAFETY INJECTION. When safety injection is actuated, the 1B CV pump will trip. The 1A CV pump must be manually started to establish high head ECCS flow.

After determining 1A SG has a tube rupture the crew will transition to 1BEP-3, STEAM GENERATOR TUBE RUPTURE.

The scenario is complete when the crew has completed the first RCS depressurization at step 17 of 1BEP-3.

Critical Tasks

1. Manually start the 1B CV pump prior to completion step 6 of 1BEP-0.
(ERG Critical Task number - E-0--I) (K/A number - 013000A4.01 importance – 4.5/4.8)
2. Isolate feedwater flow into and steam flow from the ruptured SG before a transition to ECA-3.1 occurs
(ERG Critical Task number - E-3--A) (K/A number - EPE038EA2.03 importance - 4.4/4.6)
3. Cooldown to establish RCS subcooling margin, but prevent entry into 1BFR-P.1
(ERG Critical Task number - E-3--B (K/A number - EPE038EA2.07importance - 4.4/4.8)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC 18, 75% power, steady state, equilibrium xenon.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Summary, HMI 1 is TR 1, and HMI 2 is TR 2. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Place Rod Control in Manual
- Place 0 CC pump from 141 and 142 in PTL.
- **Verify 1A EH pump is running and 1B EH pump is in standby.**
- **Verify 1B CV pump is running and 1A CV pump is in standby.**
- Run **cae E:\C10-4RUN** to insert the CAEP that contains the commands for the scenario. **CHANGE THIS**
- Run **bat E:\C10-4SETUP** from thumb drive (in **CAEP**) and verify the following actuate: **CHANGE THIS**
 - **IMF FW35A**
 - **IRF CC42 RO**
 - **IMF RP15A**
 - **MRF RP83 OPEN**
 - **TRGSET 2 "ZLO1SI01PB(3) = = 1"**
 - **IMF CV01B (2 0)**
 - **IMF MS01A 100**
- Set ΔI Target Curve slopes to match actual ΔI .
- Provide examinees with turnover sheets.

Event 1: SG PORV 1MS018A inoperable (Tech Spec)

Insert the following from the CAEP and verify the following actuate:

- **IMF PA0252 ON**
- **IMF PA0253 ON**
- **IOR ZDI1MS018A CLS**

As SM acknowledge the failure, LCO 3.6.3, condition C and LCO 3.7.4, condition A, and requests for on line risk assessment, maintenance support, and IR initiation.

If dispatched as EO, report 1MS018A has a broken hydraulic line and a small puddle of hydraulic fluid is present beneath the valve.

As WEC supervisor. acknowledge request for EST for 1MS018A C/S, if EST is requested.

If dispatched as EO to close 1MS019A, perform the following:

- **MRF MS51 0**

Event 2: Pressurizer level channel 1LT-459 failed low.

Insert **IMF RX13A 0 15** to fail 1LT-459 low over a 15 second period.

If lead examiner desires the bistables tripped, participate in brief and perform the following:

- As assist NSO contact Unit 1 (X-2208)
- Insert the following:
 - **MRF RP20 OPEN** (open protection cabinet #1 door)
 - **MRF RX029 TRIP** (trip PZR hi water level Rx trip bistable LB459A)
 - **MRF RP20 CLOSE** (close protection cabinet #1 door)

As SM acknowledge the failure, LCOs 3.3.1, conditions A and K entry, on line risk assessment, request for maintenance support, and IR requests.

Event 3: Steam flow channel 1FT-513A fails high

Insert **IMF RX03B 4.8 30** to fail 1FT-513A high over a 30 second period.

As SM acknowledge the failure, on line risk assessment, request for maintenance support, and IR requests.

Event 4: 1A Heater Drain Pump trip

Insert **IMF FW35A** to trip the 1A Heater Drain Pump.

Acknowledge as SM the 1A HD pump trip, 1BOA SEC-1 entry, request for E Plan evaluation, and requests for on line risk assessment, maintenance support, and IR initiation.

If dispatched as EO, report **1A** Heater Drain pump is seized and report ground overcurrent flag at breaker cubicle. Report that **1C** HD pump appears normal, no obvious problem.

Acknowledge as Power Team load reduction and estimated duration of derate.

Event 5: Boric acid transfer pump trip

Note: Ensure a boration is in progress prior to inserting the next malfunction.

Insert **IMF CV03** to trip the Unit 1 boric acid pump.

If dispatched as EO, report Unit 1 AB pump breaker 133X3 is tripped and does not appear to be damaged. If breaker reclosure is requested, report breaker is closed. **DO NOT DELETE MALFUNCTION.** If pump restart is attempted, report the breaker is open.

If dispatched as EO, report the Unit 1 AB pump bearing is hot and appears to be damaged.

If contacted as Unit 2, report Unit 0 AB pump is NOT supplying Unit 2 demands and is NOT electrically aligned to Unit 2.

If dispatched as EO, align the Unit 0 AB pump to Unit 1 demands per BOP AB-6 as follows:

- Verify w/MCR U-1 makeup c/s is in STOP (BOP AB-6, step F.1.b)
- Verify w/MCR AB pump 1 + 0 c/s is in PTL (BOP AB-6, step F.1.c)
- Insert **IOR ZLO0AB03P ON**
- Wait approximately two minutes then perform the following:
 - Delete malfunction **DMF CV03**
- Report Unit 0 AB pump aligned for Unit 1 demands (BOP AB-6 is complete up to step F.1.k)

As SM, acknowledge the failure and requests for on line risk assessment, maintenance support, and IR initiation.

Event 6: 1PT507 fails High

Insert **IMF RX05 1500** to fail 1PT507 to 1500 psig.

As SM, acknowledge the failure and requests for on line risk assessment, maintenance support, and IR initiation.

Event 7: Ruptured 1A SG

Insert **IMF TH03A 350** to cause a rupture in the 1A SG steam generator.

Acknowledge as SM procedure changes, E Plan evaluations, and STA request.

After STA requested, as STA report CSF status:

Event 8: 1B CV pump trips/1A CV pump fails to auto start (preload)

If dispatched as EO to investigate 1B CV pump, report ground overcurrent flag at breaker cubicle.

Comments: _____

Simulation Facility <u>Byron</u>	Scenario No.: Operating Test No.: 2012 NRC Exam
Examiners:	NRC 10-2
_____	Applicant: _____ SRO
_____	_____ RO
_____	_____ BOP
Initial Conditions: IC-182	
Turnover: Unit 1 is at 90% power, steady state, equilibrium xenon, MOL. RCS boron concentration is 887 ppm. On line risk is green. 1A MDFW pump has been OOS for the last 2 days for motor replacement and is expected back in 2 shifts. 2A AF pp is O.O.S.	

Event No.	Malf. No.	Event Type	Event Description
Preload	1A MDFW pp O.O.S. ZLO1FW002A1-off ZLO1FW012A1- off IMF FW44 IOR SI24, SI25 OVER	C C	1A MDFW pp O.O.S. 1B AF pump fail to start SI8801A/B fail to open automatically
1	IMF CV01A	C (RO, US) TS (US)	1A CV pump trip.
2	IMF FW02A	C (BOP, US)	1B FW pp Trips requiring a main turbine runback.
3	IMF RD09 1	R (RO, US)	Auto rod speed fails to 1 SPM
4	IMF RX29B 100	C (BOP, US)	1FW520 fails to 100% in auto during runback
5	IMF ED07A	C (US, BOP) TS (US)	Loss of bus 141
6	IMF RX21A 2500 10	I (RO, US)	Pressurizer pressure channel 1PT-455 fails high
7	Preload	M (ALL)	Loss of heat sink
8	IOR SI24,SI25 OVER	C (SRO/RO)	Both SI 8801s fail to auto open, manual open required

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

SCENARIO OVERVIEW

Unit 1 is at 90% power, steady state, equilibrium xenon, MOL. RCS boron concentration in 914 ppm. Control bank D rods are at 194 steps. On line risk is green.

After completing shift turnover and relief, 1A CV pump trips. The RO will verify suction path and start the 1B CV pump to restore charging flow. The Unit Supervisor will determine that entry into TS 3.5.2 Condition A

After the CV pump trip has been addressed, the 1B MFW pp will trip which will require a turbine runback to 700 MWe due to the MDFW pp being out of service. The crew will enter 1BOA SEC-1, SECONDARY PUMP TRIP.

During the runback, Auto Rod Speed will fail to 1 SPM, manual rod speed will be available at 48 SPM. This will require the RO to borate during the "runback". In addition, during the transient, 1FW520 (1B SG FWRV) auto controller will fail to 100% in auto which will result in eventual over feeding the 1B SG. The BOP will have to recognize the possible overfeeding of the 1B SG and take manual control of the FWRV. Manual feedwater control will be available.

Following completion of 1BOA SEC-1 actions, a ground fault will occur on bus 141. The crew will enter 1BOA ELECT-3, LOSS OF 4KV ESF BUS. The 1B SX pump must be manually started along with 1D RCFC and 1B VA Supply and Exhaust fans.

Following completion of 1BOA ELEC-3 actions, the controlling pressurizer pressure channel will fail high. Pressurizer PORV 1RY-455A will open, both pressurizer spray valves will open, and all pressurizer heaters will deenergize, causing RCS pressure to lower. The RO will take manual control of RCS pressure control and attempt to stabilize. 1RY455A will fail to fully close and cause RCS pressure to continue to lower. The PORV Isolation valve, 1RY8000A, is deenergized due to the Bus 141 fault, resulting in the control room inability to isolate the failed PZR PORV. The crew will manually Trip the reactor and initiate Safety Injection.

The 1B AF pump engine will seize. The crew will perform 1BEP-0, REACTOR TRIP OR SAFETY INJECTION, and transition to 1BFR-H.1, RESPONSE TO LOSS OF SECONDARY HEAT SINK, at step 15 of 1BEP-0. The high head injection flowpath will be manually established. The scenario is complete when the crew has established adequate feedwater pump flow from the Startup Feedwater pump to the non-faulted SGs in step 9 of 1BFR-H.1.

Critical Tasks

1. Manually start an SX pump before plant and scenario specific criteria are exceeded:
 - CV pump high temperature alarm
 - CC HX outlet temperature high alarm
 - D/G High Jacket Water temperature alarm(ERG Critical Task number – E-0 –L)
2. Establish feedwater flow into at least one SG before RCS bleed and feed is required.
(ERG Critical Task number - FR-H.1--A)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC IC-182, 90% power, MOL, steady state, equilibrium xenon.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Ensure Rod Control is in auto.
- Place 1A CV pump in service, shut down 1B CV pump.
- Place 0B VC Train in service
- Place 1A MDFW pp C/S in Pull-Out
- Place 1A MDFW pp Aux. L/O pp C/S in Pull-Out
- Close 1FW002A: 1A FW pump discharge valve
- Verify RM-11 is on grid 1. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Place Turnover and ReMa, 1BGP 100-4T3, Load Change Instruction Sheet on the Unit Desk
- Run **bat F:\N10-2SETUP** from thumb drive and verify the following actuate:
 - **IMF CV01B (CHANGE ALL OF THESE)**
 - **IMF FW44**
 - **IMF RP15R**
 - **MRF RP89 OPEN**
 - **IOR PN1143 OFF**
 - **IOR PN1144 OFF**
- Set ΔI Target Curve slopes to match actual ΔI
- Run **CAE F:\N10-2.cae** from the thumb drive to insert MF and RF in the Run Aid Guide.

Event 1: 1A CV Pump Trip

IMF CV01A

As EO, report overcurrent trip on 1A CV pump, and 1B CV pump is running normally after the start.

As SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Acknowledge as Shift Manager commencement and completion of all procedures performed by the crew when notified.

NOTE to EVALUATORS: **Events 2, 3 and 4 will be run simultaneously.**

Event 2: 1B FW pp Trip

Insert **IMF FW02A** to trip the 1B FW pump..

If dispatched as Equipment Operator to the FW pumps, report no abnormal indications present.

As SM acknowledge the failure, on line risk assessment, request for maintenance support, and IR requests.

Acknowledge as chemistry/rad protection requests for RCS samples and surveillance performance.

Event 3: Auto Rod speed failure to 1 step per minute in auto

Insert **IMF RD09 1** to fail rod speed to 1 SPM in auto.

Unit 1 will lower power to 700 MW at 250 MW/min due to FW pump trip

Acknowledge as chemistry/rad protection requests for RCS samples (if required).

As SM acknowledge the failure, on line risk assessment, request for maintenance support, and IR requests.

Event 4: 1FW520 fails open in auto

Insert **IMF RX29B 100 90** to fail the 1B SG FWRV to the full open position during the transient.

As SM acknowledge the failure, on line risk assessment, request for maintenance support, and IR requests.

If dispatched as Equipment Operator, wait one minute and report 1FW520 appears normal.

Event 5: Loss of 4KV ESF Bus 141

Insert **IMF ED07A** to cause a loss of Bus 141

As EO inform crew that a ground overcurrent relay target for the BKR 1412 has dropped, after being dispatched

If requested as Equipment Operator to cross-tie 125 VDC bus 111 to 125VDC bus 211 wait five minutes and insert the following:

- **MRF ED111 CLOSE**

If dispatched as Equipment Operator to depress 1A DG emergency stop push button insert the following:

- **MRF EG19 TRIP**

As SM acknowledge the failure, on line risk assessment, request for maintenance support, and IR requests.

SM Acknowledge entry into TS 3.8.9 and other applicable Tech Specs.

Event 6: Pressurizer pressure channel 1PT-455 fails high: resulting in a Reactor trip.

Insert **IMF RX21A 2500 10** to fail 1PT-455 high over a 10 second period.

Insert **IMF TH11A 25 90** to fail 1RY455A to 25% open over 90 seconds

As SM acknowledge the entry into 1BEP-0

Acknowledge as SM procedure changes, E Plan evaluations, and STA request.

After STA requested, as STA report CSF status – Red path on heat sink (until feed flow established).

If dispatched as Equipment Operator, report 1B AF pump has large lube oil leak and engine damage.

Acknowledge as U2 NSO request to remove FW isolation fuses insert the following:

- **MRF FW150 REMOVED**
- **MRF FW151 REMOVED**

Acknowledge as Equipment Operator to start Startup FW pump aux oil pump and insert the following:

- **MRF FW149 START**

Comments: _____

Simulation Facility	<u>Byron</u>	Scenario No.:	Operating Test No. 2012 NRC
Examiners:	_____	10-3	Examination
	_____	Applicant:	_____
	_____		SRO
			RO
			BOP
Initial Conditions:	IC-22		
Turnover:	Unit 1 is at 100% power, steady state, equilibrium xenon, MOL. Online risk is green. A TV/GV surveillance is scheduled to be performed. The unit will be ramped to 89% power at 3MW/min for the surveillance.		

Event No.	Malf. No.	Event Type*	Event Description
Preload	IMF RP15E IMF RP15F IOR zlo1cv129(1) on IOR zlo1cv129(2) off (from trigger zdi1CV129(1).gt.0)		ESF relay failure of 1A RH pump ESF relay failure of 1B RH pump
1		R (RO) (SRO) N (BOP, SRO)	Ramp down for TV/GV surveillance
2	IMF RX10A	I (RO, SRO) TS (SRO)	1PT 505 fails high
3	IMF FW16	I (BOP, SRO)	1PT508 fails high
4	IMFCV09 50	C (RO, SRO)	1CV130 controller temperature element will fail low causing rising letdown temperatures
5	IOR ZDI1FW012C open	C (BOP, SRO)	1FW012C recirc fails open
6	None	TS (SRO)	Notified that SI pump failed ASME surveillance
7	MF TH04C 540000	M (all)	LB LOCA terminating in transfer to Cold Leg Recirc
8	Pre-load	C (all)	ESF relay failure of 1A & B RH pumps – manual start required

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

SCENARIO OVERVIEW

Unit 1 is at 100% power, steady state, equilibrium xenon, MOL. Online risk is green. CBD @ 221 steps, and boron concentration is 883 ppm. 1BOSR 3.g..4-1, Turbine Throttle and Governor Valve surveillance is scheduled later on in this shift and requires the unit to be ramped to 89% power at 3MW/min.

After completing shift turnover and relief, the crew will ramp the unit to 89% power at 3MW/min

After normal operation, , turbine impulse pressure channel 1PT-505 will fail high over a 30 second period. Control rods will begin automatically withdrawing. After recognizing the instrument failure and checking turbine power stable, the RO will place rod control in manual to stop the outward rod motion. 1BOA INST-2, OPERATION WITH A FAILED INSTRUMENT CHANNEL, Attachment A, will be implemented. The crew will defeat the failed instrument and the RO will restore Tave – Tref deviation. Technical specification 3.3.1, conditions A and P apply. 1PT505 will fail low which will require the crew to enter 1BOA Instrument 2, OPERATION WITH A FAILED INSTRUMENT CHANNEL, Place rods in manual and perform functions to defeat the failed channel. The SRO will enter Tech. Spec 3.3.1. Condition P.

After the PT-505 failure is addressed, 1PT 508 will fail high causing feed pump speed to lower. The BOP will respond and manual FW pp speed control will be available. AUTOMATIC operation of Feedwater pump speed control will not be available for the remainder of the scenario.

After the 1PT-508 failure has been addressed, 1CC 130 controller will slowly fail 1CC130 closed in AUTOMATIC. The RO will take manual control and restore normal letdown temperature. The divert valve around the CV demins fails to divert automatically and will require the RO to manually divert. Normal letdown temperature indication will be lost.

After letdown temperature is restored, 1FW-012C fails open. The BOP will take manual control and restore normal feedwater flow.

After normal feedwater flow is restored and the plant stabilized, the Unit Supervisor will be called by Engineering stating that after reviewing the previously run ASME surveillance the 1A SI pump has failed the acceptance criteria.

After the Unit Supervisor has evaluated the failed ASME acceptance criteria associated with the 1A SI pump, a LB LOCA occurs in the 1C hot leg. The crew will respond utilizing 1BEP-0, 1BEP-1 and will eventually transition to 1BEP ES-1.3 Transfer to Cold Leg Recirculation.. 1A and B RH pumps will fail to start on the SI signal but start if a manual start is attempted. The cause of the auto start failure is two ESF relay failures. RCP trip criteria will be met, requiring the RCPs to be tripped.

Completion criteria is selection of and transition to 1BEP ES-1.3, Transfer to Cold Leg Recirculation and completion of the first 7 steps..

Critical Tasks

1. Manually trip RCPs.
(ERG Critical Task number – E-1--C)
2. Manually start the 1A and 1B RH pumps.
(ERG Critical Task number – E-0--H)
3. Swap to Cold Leg Recirc.
(ERG Critical Task number – ES-1.3--A)

SIMULATOR SETUP GUIDE:

- Verify/perform TQ-BY-201-0113, BYRON TRAINING DEPARTMENT SIMULATOR EXAMINATION SECURITY ACTIONS CHECKLIST.
- Establish the conditions of IC 22, 100% power, MOL, steady state, equilibrium xenon.
- Complete items on Simulator Ready for Training Checklist.
- Verify/remove any Equipment Status Tags and Danger Tags not applicable to the scenario.
- Place simulator in RUN (allow simulator to run during board walk down and turnover).
- Verify RM-11 is on grid 1, CRT 1 is NR SPDS, CRT 2 is DI Summary, CRT 3 is Plant Summary, HMI 1 is TR 7, and HMI 2 is TR 16. Reset SER screens and chart recorders. Ensure horns are turned ON. Set BA and PW controllers to Rema numbers or 0 and reset.
- Place Turnover and ReMa, 1BGP 100-4T3 and Load Change Instruction Sheet on desk
-
- Run **bat F:\C10-1SETUP** from thumb drive and verify the following actuate: **CHANGE ALL OF THESE**

Preloaded

- RF RP84
- MF RP15D
- RF CC02B 200
- MF SI01A

In **caep C10-1RUN** to run the scenario

- MF NI09D
 - RF RP23
 - RF RX025
 - RF RX141
- MF CC01B
- MF CV10
- MF RX02D
- MF FW09D
- MF TH06C

Event 1: Ramp to 89% power for TV/GV surveillance

SM acknowledge start of ramp when notified.
TSO acknowledge start of ramp when notified.

Event 2: Turbine impulse pressure 1PT505 fails low

Insert **IMF RX10A 800 30** to fail 1PT-505 high over a 30 second period.

If lead examiner desires the bistables tripped, participate in brief and perform the following:

- As extra NSO contact Unit 1 (X-2209)
- Insert the following:
 - **MRF RP20 OPEN** (open protection cabinet #1 door)
 - **MRF RX143 TRIP** (trip turbine power P-13 bistable PB505A)
 - **MRF RP20 CLOSE** (close protection cabinet #1 door)

If lead examiner desires the AMS bistables tripped, participate in brief and perform the following:

- As extra NSO contact Unit 1 (X-2209)
- Insert the following:
 - **IOR PN0470 ON** (place operating bypass switch 12 in TIP 1 position) (On annunciator tab of Action List)
 - **MRF RX149 TRIP** (place operating bypass input switch 11 to test-trip)

Acknowledge as Shift Manager the failure, LCOAR entry, on line risk assessment, EAL evaluation, request for maintenance support, and IR request.

Event 3: Feedwater header pressure 1PT508 fails high.

NOTE: Ensure control rods are in AUTO before inserting this MF.

As **WEC or Extra NSO**, acknowledge request to trip bistables.

SM Acknowledge entry into TS

SM Acknowledge request for writing IR, performing risk assessment and making appropriate notifications.

Event 4: Temperature element 1CC130 fails low causing rising letdown temperatures without divert valve 1CV129 bypassing the demineralizers automatically

To reset the CC to CNMT Penetration Cooling alarm, **MRF CC50 to RESET**

SM acknowledge the failure, TS entry, on line risk assessment, request for maintenance support, and IR requests.

Event 5: 1C FW pump recirc valve (1FW012C) fails open in auto, manual closure will function

IOR
Have trigger to delete OR when CS taken to close

If dispatched as EO to investigate 1FW-012C, report valve is responding normally.

SM acknowledge failure, online risk evaluation and IR initiation

Event 6: Unit Supervisor is notified that SI pump has failed ASME acceptance criteria

SM acknowledge T/S 3.5.2 entry conditions

Event 7: Large Break LOCA with failure of ESF start relays on both RH pumps, requiring manual start, which functions

IMF TH04C Large Break LOCA on 1C Hot leg.

SM acknowledge procedure entry and E Plan evaluations.

Event 8: LOCA

1A and 1B RH pump relay failure requiring manual start

CHANGE THIS

(In Preload) MRF RP OPEN and IMF RP15D to prevent SI auto start of 1B SI pump.

AT THE CONCLUSION OF THE SCENARIO,

- **ENSURE THE FOLLOWING COMPUTER POINTS ARE TAKEN OUT OF TEST AND RETURNED TO SCAN:
N0047, N0048, U1143, N0052A, U0921, U0923**

Comments: _____

Facility: <u>Byron</u>		Date of Examination: <u>01/23/12</u>
Examination Level: RO <input checked="" type="checkbox"/> SRO <input type="checkbox"/>		Operating Test Number: <u>301</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R,M	RA-1.a Calculate a reactivity change (up power) K/A 2.1.37 Imp: 4.3
Conduct of Operations	S, D, P	RA-1.b Perform Off-site AC power availability surveillance K/A 2.1.31 Imp: 4.6
Equipment Control	R, M	RA-2 Identify Leak isolation points from station mechanical drawings K/A 2.2.41 Imp: 3.5
Radiation Control	S, D	RA-3 Change setpoints of 1PR01J K/A 2.3.5 Imp: 2.9
Emergency Procedures/Plan		
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 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>Byron</u>		Date of Examination: <u>01/23/12</u>
Examination Level: RO <input type="checkbox"/> SRO <input checked="" type="checkbox"/>		Operating Test Number: <u>301</u>
Administrative Topic (See Note)	Type Code*	Describe activity to be performed
Conduct of Operations	R, M	SA-1a Evaluate a reactivity change K/A 2.1.37 Imp: 4.6
Conduct of Operations	R, D	SA-1b Determine venting time for Reactor Vessel head void K/A 2.1.25 Imp: 4.2
Equipment Control	R, M	SA-2 Initiate a LCOAR K/A 2.2.23 Imp: 4.6
Radiation Control	S, D	SA-3 Change setpoints of OPR01J K/A 2.3.5 Imp: 2.9
Emergency Procedures/Plan	R, M	SA-4 Classify event and fill out NARS form-LOCA K/A 2.4.41 Imp 4.6
NOTE: All items (5 total) are required for SROs. RO applicants require only 4 items unless they are retaking only the administrative topics, when 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>Byron</u>		Date of Examination: <u>01/23/2012</u>
Exam Level: RO <input checked="" type="checkbox"/> SRO-I <input type="checkbox"/> SRO-U <input type="checkbox"/>		Operating Test Number: <u>301</u>
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
a. Moveable Control Assemblies Quarterly surveillance KA 014A4.02 Imp: 3.4	D,S	1
b. Fill SI accumulator KA 006A1.13 Imp: 3.5	N, A, S	2
c. Swap to Hot Leg Recirc KA 011EA1.11 Imp: 4.2	N, A, L, S	3
d. Respond to 1A SX Pump Trip (standby pump doesn't start) KA 076A2.01 Imp: 3.5	D, A, S	4s
e. Start CS pump KA 026A4.01 Imp: 4.5	D, A, L, EN, S	5
f. Unload D/G that's paralleled to SAT KA 064A4.06 Imp: 3.1	D, S	6
g. Align ventilation KA 072A3.01 Imp: 2.9	D, A, L, S	8
h. Establish RH letdown flow KA 005G2.1.23 Imp: 4.3	D, L, S	4p
In-Plant Systems [@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)		
i. Local initiation of FP KA 086A2.04 Imp: 3.3	A, D,	8
j. Align U-2 AF to Unit 1 KA061G2.1.30 Imp: 4.4	N, R, E	4s
k. Start-up Inst. inverter KA 057AA1.01 Imp: 3.7	D	6
<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>Byron</u> Exam Level: RO <input type="checkbox"/> SRO-I <input checked="" type="checkbox"/> SRO-U <input type="checkbox"/>	Date of Examination: <u>01/23/2012</u> Operating Test Number: <u>301</u>
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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
a. Moveable Control Assemblies Quarterly surveillance KA 014A4.02 Imp: 3.2	D,S	1
b. Fill SI accumulator KA 006A1.13 Imp: 3.7	N, A, S	2
c. Swap to Hot Leg Recirc KA 011EA1.11 Imp: 4.2	N, A, L, S	3
d. Respond to 1A SX Pump Trip (Standby pump does not start) KA 076A2.01 Imp: 3.5	D, S	4s
e. Start CS pump KA 026A4.01 Imp: 4.3	D, A, L, EN, S	5
f. Unload D/G that's paralleled to SAT KA 064A4.06 Imp: 3.9	D, S	6
g. Align ventilation KA 072A3.01 Imp: 3.1	D, A, L, S	8
h.		

In-Plant Systems[@] (3 for RO); (3 for SRO-I); (3 or 2 for SRO-U)

i. Local initiation of FP KA 086A2.04 Imp: 3.9	A, D,	8
j. Align U-2 AF to Unit 1 KA061G2.1.30 Imp: 4.0	N, R, E	4s
k. Start-up Inst. inverter KA 057AA1.01 Imp: 3.7	D	6

[@] 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.

* Type Codes	Criteria for RO / SRO-I / SRO-U
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(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	

Instructions:

1. Check the applicant level and enter the operating test number and Form ES-D-1 event numbers for each event type; TS are not applicable for RO applicants. ROs must serve in both the "at-the-controls (ATC)" and "balance-of-plant (BOP)" positions; Instant SROs must serve in both the SRO and the ATC positions, including at least two instrument or component (I/C) malfunctions and one major transient, in the ATC position. If an Instant SRO *additionally* serves in the BOP position, one I/C malfunction can be credited toward the two I/C malfunctions required for the ATC position.
2. Reactivity manipulations may be conducted under normal or *controlled* abnormal conditions (refer to Section D.5.d) but must be significant per Section C.2.a of Appendix D. (*) Reactivity and normal evolutions may be replaced with additional instrument or component malfunctions on a 1-for-1 basis.
3. Whenever practical, both instrument and component malfunctions should be included; only those that require verifiable actions that provide insight to the applicant's competence count toward the minimum requirements specified for the applicant's license level in the right-hand columns.