NRC2006
SIM01

NUMBER AND TITLE:	NRC2006-SIM01 Perform Emergency Boration During ATWS (**ALT**)	**REVISION:**	0
TRAINING PROGRAM :	INITIAL LICENSED OPERATOR (ILT)	**TIME:**	8 Minutes
SCOPE OF REVISION:	New Issue		

			DATE:
AUTHOR	**Name:**	Max Bailey	
	Signature:		
FACILITY REVIEWER	**Name:**		
	Signature:		
		Facility Supervisor / Manager	

REFERENCES

1. **Task Number:** EOP0870501

2. **K/A Number:** APE 024 A1.17 {3.9/3.9}
   SYS 004 A2.14 {3.8/3.9}

3. **Procedures:**
   02-OHP-4023-FR-S.1, Rev 10 Response to Nuclear Power Generation/ATWS

EVALUATION SETTINGS[1]

1. Unit 2 Simulator

HANDOUTS

1. Copy of 02-OHP 4023.FR-S.1 procedure

ATTACHMENTS

1. NONE

SIMULATOR SETUP[2]

1. Initialize at any Power IC 981 (IC 28)
2. Insert MALF RP03A and RP03B, Fail Reactor Trip Breakers CLOSED
3. Insert MALF RP10A and RP10B; Fail AUTO SI actuation
4. Manually trip the Main Turbine
5. Perform Steps 1 – 4 of 02 OHP 4023-FR-S.1 and place rod control in MANUAL
6. Insert Override - **ZGI43BAP4S** to **SLOW** (Maintains #4 BAP speed in SLOW)
7. Insert Override - **ZGIRU20** to **IN** (Maintains continuos rod motion in MANUAL)
8. Insert Malf – **101BAP3** (Failure of the #3 BAP)

TASK OBJECTIVES/STANDARDS[3]

1. Operator has established Emergency Boration to the RCS.

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[1] Evaluation settings are listed in the preferred order.
[2] Simulator setup can be stored in a temporary IC to expedite the evaluation process.
[3] These standards should not exceed those used in ILT.

EVALUATOR INSTRUCTIONS

1. Ensure simulator setup is complete
2. Brief the operator (May be performed by giving out Task Briefing Sheet)
3. Announce start of the JPM
4. Perform evolution
5. At completion of evolution, announce "This JPM is Complete."
6. Document evaluation performance.

TASK BRIEFING

INITIAL CONDITIONS

You are the Reactor Operator. The crew has entered 02-OHP 4023.FR-S.1, Response to Power Generation/ATWS, due to a failure of the reactor to automatically or manually trip. The Balance Of Plant Operator is monitoring Rod Insertion.

INITIATING CUE

The Unit Supervisor directs you to initiate Emergency Boration to the RCS in accordance with Step 5 of 02-OHP 4023.FR-S.1.

Number: 02-OHP-4023 FR-S.1	Title: RESPONSE TO NUCLEAR POWER GENERATION / ATWS	Revision Number: 10

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
4.	**Check AFW Pumps Running:**	
	a. MDAFPs - BOTH RUNNING	a. Manually start pumps.
	b. TDAFP - RUNNING	b. **IF** the TDAFP failed to start, **THEN** perform the following: 1) Verify TDAFP steam supply valves are open: • 2-MCM-221 (SG 22) • 2-MCM-231 (SG 23) 2) **IF** "TDAFP Trip & Throt Vlv Unlatched" annunciator (Panel 214, Drop 10) is lit, **THEN** manually or locally reset TDAFP. 3) Manually start TDAFP.
5.	**Initiate Emergency Boration Of RCS:**	
	a. Check CCPs - AT LEAST ONE RUNNING	a. Start one CCP.
	b. Initiate emergency boration: 1) Start both boric acid transfer pumps in FAST speed 2) Open 2-QMO-420, emergency boration to CCP suction valve	b. **IF** SI is actuated, **THEN** go to Step 5.c (Page 6) **IF** SI is **NOT** actuated, **THEN** align one of the following boration flowpaths: • RWST flowpath: 1) Open at least one CCP suction from RWST valve:

(Step 5 Continued On Next Page)

Operator verifies ONE CCP is running

Operator attempts to start BOTH BAPs

NOTE: AUTO SI did NOT actuate. Manual SI was NOT performed.

Operator implements RNO action with SI NOT Actuated

CT: Operator Opens at least ONE CCP suction from RWST valve (See next Page)

{**CT**} Critical Step

Number: 02-OHP-4023 FR-S.1	Title: RESPONSE TO NUCLEAR POWER GENERATION / ATWS	Revision Number: 10

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 5 Continued From Previous Page)	
	3) Check emergency boration flow - GREATER THAN 44 GPM • 2-QFI-420	• 2-IMO-910 • 2-IMO-911 2) Close at least one CCP suction from VCT valve: • 2-QMO-451 • 2-QMO-452 3) Maximize charging flow. 4) Verify letdown flow established. -OR- • Normal boration flowpath: 1) Open both boration valves: • 2-QRV-400 • 2-QRV-421 2) Start both boric acid transfer pumps in FAST speed. 3) Verify boric acid flow is greater than 36 gpm: • 2-QFC-421
	(Step 5 Continued On Next Page)	

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CT: Operator OPENs RWST isolation valves 2-IMO-910 and/or 2-IMO-911

CT: Operator CLOSEs CCP suction valves 2-QMO-451 and/or 2-QMO-452

CT: Operator raises charging flow to maximum. (Charging flow ≥ 100 gpm)

Operator verifies normal letdown flow in progress. (Letdown Flow ≥ 75 gpm)

Number: 02-OHP-4023 FR-S.1	Title: RESPONSE TO NUCLEAR POWER GENERATION / ATWS	Revision Number: 10

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 5 Continued From Previous Page)	
	c. Check PRZ pressure - LESS THAN 2335 PSIG	c. Check PRZ PORVs and associated block valves are open: • 2-NRV-151 and 2-NMO-151 • 2-NRV-152 and 2-NMO-152 • 2-NRV-153 and 2-NMO-153 **IF** PRZ PORVs and block valves are **NOT** open, **THEN** open PRZ PORVs and associated block valves as necessary, until PRZ pressure is less than 2135 psig.

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Operator verifies PZR pressure is less than 2335 psig.

THIS JPM is COMPLETE:

CT: Critical Step

TASK BRIEFING

You are the Reactor Operator. The crew has entered 02-OHP 4023.FR-S.1, Response to Power Generation/ATWS, due to a failure of the reactor to automatically or manually trip. The Balance Of Plant Operator is monitoring Rod Insertion.

The Unit Supervisor directs you to initiate Emergency Boration to the RCS in accordance with Step 5 of 02-OHP 4023.FR-S.1.

NRC2006
SIM02

TITLE	**Raise SI Accumulator Level**	**REVISION**	**0**
PROGRAM	**Initial Licensed Operator (ILT)**	**TIME**	**15 Minutes**

			DATE:
AUTHOR	**Name:**	Max Bailey	
	Signature:		
FACILITY REVIEWER	**Name:**		
	Signature:		
		Facility Supervisor / Manager	

REFERENCES

02-OHP-4021-008-004, Rev 15	Adjusting the Level of an Accumulator
02-OHP-4021-008-007, Rev 4	Operation of the Safety Injection Pumps
02-OHL-4030-SOM-041, Rev 11	Unit 2 Tours – U2 CR M1&2 SHIFT CHKS

TASKS

Task Number: 0080240101 Increase Accumulator level in MODES 1, 2, or 3

K/A Number: SYS 006 A1.13 Ability to predict and/or monitor changes in parameters associated with Accumulator pressure, level, or boron concentration.

K/A Value: RO - 3.5 SRO - 3.7

EVALUATION SETTINGS[1]

Unit 2 Simulator

HANDOUTS

Copy of Attachment 3 to 02-OHP 4021.008.004
Copy of 02-OHP 4021.008.007
Copy of 02-OHL-4030-SOM-041

ATTACHMENTS

CAUTION TAG for the West RHR Pump

SIMULATOR SETUP[2]

1. Initialize at any Power IC 983
2. Drain Accumulator No. 1 until Panel 206, Drop 16 alarm in IN (~927 ft^3)
3. Restore drain lineup to normal and FREEZE the simulator

1

TASK OBJECTIVES/STANDARDS[3]

Accumulator No. 1 Low Level Alarm is CLEAR and water level has been restored to within Tech Spec Limits {927.5 ft^3 to 965 ft^3}

TASK BRIEFING

You are an extra operator.

A low-level condition has been identified on the Unit 2 No. 1 Accumulator. It has been verified that NO personnel are in Containment.

The Unit Supervisor directs you to raise the No. 1 Accumulator level to 940 ft^3 using the South SI pump, in accordance with Attachment 3 of 02-OHP 4021.008.004.

The Starting Team is standing by to start the South SI pump in accordance with 02-OHP-4021-008-007 and to assist with Local Operations.

Continuous	2-OHP-4021-008-004	Rev. 15	Page 20 of 48
Adjusting the Level of an Accumulator			
Attachment 3	Raising an Accumulator Level with the RCS Pressure above 1700 psig with the South Safety Injection Pump		Pages: 20 - 32

1 PURPOSE AND SCOPE

1.1 This attachment provides instructions to increase an accumulator level with Reactor Coolant System (RCS) pressure greater than 1700 psig with the South Safety Injection (SI) Pump.

2 PREREQUISITES **INIT**

2.1 Nitrogen is available to regulate the accumulator pressure per 12-OHP-4021-030-001, Operation of the Reactor Nitrogen System.

3 PRECAUTIONS AND LIMITATIONS

3.1 **[Current TS]** If during MODE 1, 2, or 3 an accumulator level or pressure gets out of specifications, it must be returned to normal within one hour per Technical Specification (TS) 3.5.1.

[Improved TS] If during MODE 1, 2, or 3 an accumulator level or pressure gets out of specifications, it must be returned to normal within 24 hours per Technical Specification (TS) 3.5.1.

3.2 If during MODE 1, 2, or 3 an accumulator boron concentration gets out of specifications, it must be returned to normal within 72 hours per TS 3.5.1.

3.3 When adjusting accumulator level during MODE 1, 2, or 3, the accumulator is INOPERABLE. The level adjustment evolution shall be halted and the system restored per Section 5.1 of this attachment in the event that a SI signal is received during the evolution.

3.4 When adjusting accumulator level during MODE 1, 2, or 3, care must be taken to ensure TS limits are not exceeded. Refer to 2-OHL-4030-SOM-041, Unit 2 Tours - U2 CR M1&2 Shift Cks, and 2-OHL-4030-SOM-042, Unit 2 Tours - U2 CR M3&4 Shift Cks, to ensure compliance with TS including instrument uncertainties.

NOTE: Prerequisites has been verified as met.

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Adjusting the Level of an Accumulator			
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3.5 **[Current TS]** If an accumulator level is raised by 10 ft^3 or more (that is NOT the result of addition from the RWST) in MODE 1, 2, or 3, it must be sampled within 6 hours to verify boron concentration (an accumulator tank volume of 1% equals approximately 10 ft^3). [Ref. 7.2.1b.2 and 7.2.1e]

[Improved TS] If an accumulator level is raised by 10 ft^3 or more (that is NOT the result of addition from the RWST) in MODE 1, 2, or 3, it must be sampled within 6 hours to verify boron concentration. [Ref. 7.2.1b.7 and 7.2.1e]

3.6 For venting of accumulators without evacuation of personnel from the Lower Containment Annulus, a Containment Purge Exhaust Fan exhausting air from lower containment must be in service per 2-OHP-4021-028-005, Operation of the Containment Purge System.

3.7 High concentrations of nitrogen in an area can cause suffocation due to insufficient oxygen. Atmospheric monitoring shall be performed prior to and during venting of accumulators if personnel are in the Lower Containment Annulus.

3.8 A valve wrench may be needed to assist in opening 2-SI-111S, South SI Pump 2-PP-26S Discharge Header Shutoff Valve, due to the ΔP across the valve (approximately 1000 psi). Unit Supervisor needs to approve the use of a valve wrench for this evolution.

4 DETAILS **INIT**

CAUTION: Only one accumulator will be filled at a time in this attachment. In the event of an incident during filling requiring ECCS (e.g., Safety Injection actuation), the evolution should be stopped and components aligned per the Corrective Actions section of this attachment.

4.1 Record accumulator number that level is being raised: ☐ #21 ☐ #22 ☐ #23 ☐ #24 ____

4.2 Verify RCS pressure is greater than 1700 psig. ____

Operator checks the #21 Accumulator box.

Operator verifies RCS pressure is greater than 1700 psig.

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Adjusting the Level of an Accumulator			
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4.3 Verify 2-ICM-265, Safety Injection Discharge to Cold Legs 2 & 3 – OPEN. ____

CAUTION: Oxygen monitoring of the Lower Containment Annulus atmosphere **SHALL** be performed prior to and during venting of accumulators if personnel are in the Lower Containment Annulus.

4.4 **IF** regulating accumulator pressure during fill, **THEN** perform the following: ____

4.4.1 Establish controls for personnel safety:

a. Verify all personnel evacuated from Lower Containment Annulus. ____

-OR-

b. Perform the following:

- Establish monitoring of Lower Containment Annulus atmosphere with an oxygen monitor. ____
- Verify a Containment Purge Exhaust Fan is in service exhausting air from lower containment per 2-OHP-4021-028-005, Operation of the Containment Purge System. ____
- Verify that at least one Lower Containment Ventilation Fan is operating in Quadrant 2 or 3 per 2-OHP-4021-028-001, Containment Ventilation. ____

Operator verifies valve 2-ICM-265 is OPEN

(**NOTE**: Accumulator pressure regulation should NOT be required.) Operator should mark step 4.4 as N/A with initial and date.

CUE: (If asked) Accumulator pressure control is NOT required at this time.

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Adjusting the Level of an Accumulator			
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4.5 Perform the following to align the SI pump discharge flowpath:

4.5.1 Declare the West RHR Pump INOPERABLE. ____

NOTE: Annunciator #206, Drop 48, WEST RHR PUMP ABNORMAL OR LOCKED OUT, will alarm when the West RHR Pump control switch is placed in LOCKOUT.

4.5.2 Place control switch for West RHR Pump in LOCKOUT. ____ IV

4.5.3 Place a Caution Tag on the West RHR Pump control switch with the following wording: ____

"To prevent deadheading a RHR Pump - Do **NOT** start W RHR Pump in the event of SI initiation **until** the SI pump cross-tie valves are open and RHR pump cross-tie valves are closed."

4.5.4 Open the following valves:

- 2-IMO-314, East RHR Pump Disch Xtie ____ IV
- 2-IMO-324, West RHR Pump Disch Xtie ____ IV

Operator reports to US that West RHR pump is INOPERABLE.

CUE: US acknowledges declaration that the West RHR pump is INOPERABLE.

CT: Operator places West RHR pump CS in LOCKOUT

CUE: Independent verification has been performed satisfactory

Operator places a Caution tag on the West RHR pump CS.

CUE: Use the prepared Caution Tag on the West RHR pump control switch.

CT: Operator OPENs valves: 2-IMO-314 and 2-IMO-324
CUE: Independent verification has been performed satisfactory

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CAUTION: **[Current TS]** When a Safety Injection Pump Crosstie valve is closed, Tech Spec 3.5.2.f is entered and Action b is applicable.

[Improved TS] When a Safety Injection Pump Crosstie valve is closed, Tech Spec 3.5.2.Condition D is entered.

4.5.5 Close one of the following valves: [Commitment #6699]

- 2-IMO-270, Safety Injection Pump Disch Xtie _____ IV

-OR-

- 2-IMO-275, Safety Injection Pump Disch Xtie _____ IV

a. **[Current TS]** TS 3.5.2.f (Action b):
[Improved TS] TS 3.5.2 Condition D:

Time_____ Date:_____ _____

4.5.6 Perform the following to minimize the pressure transient on the South SI Pump discharge header:

a. Declare the South SI Pump INOPERABLE. _____

b. Close 2-SI-111S, South SI Pump 2-PP-26S Discharge Header Shutoff Valve. _____

NOTE: The South SI Pump discharge header will begin to depressurize when 2-SI-112S is opened. Coordinating opening 2-SI-112S and starting the South SI Pump will minimize the pressure drop in discharge header.

c. Open 2-SI-112S, South SI Pump 2-PP-26S Discharge Drain & Leakby Shutoff Valve. _____

4.6 Start South Safety Injection Pump per 2-OHP-4021-008-007, Operation of the Safety Injection Pumps. _____

CUE: (If Asked) US acknowledge entry into LCO 3.5.2 Condition D

CT: Operator CLOSEs valve: 2-IMO-270 ***OR*** 2-IMO-275

CUE: Independent verification has been performed satisfactory

CUE: STA will enter time and date of Tech Spec entry.

Operator reports that South SI pump is INOPERABLE

CUE: US acknowledges South SI pump is INOPERABLE.

Operator directs AEO to CLOSE valve 2-SI-111S.
CUE: AEO reports valve 2-SI-111S is CLOSED.

Operator directs AEO to OPEN valve 2-SI-112S
CUE: AEO reports valve 2-SI-112S is OPEN.

NOTE: Provide a copy of 02-OHP 4021.008.007 to operator.
CUE: Local operator actions have been completed and verified.

Continuous	02-OHP-4021-008-007	Rev. 4	Page 7 of 9
Operation of the Safety Injection Pumps			

4.4 Establish direct communications between the operator at the SI Pump and an operator in the Control Room. ____

4.5 Start the desired SI pump:

- 2-PP-26N, Safety Injection North Pump ____

-OR-

- 2-PP-26S, Safety Injection South Pump ____

4.6 Verify the following:

4.6.1 Recirculation flow is greater than 30 gpm within 10 seconds of pump start. [Ref 7.2.1e] ____

4.6.2 IF the pump is operating on recirculation flow:

- Vibration is within the limits of TDB Figure 15.2. ____
- Running current is approximately 30 amps (Control Room). ____

4.6.3 The following temperatures are normal (local) and not excessively hot to the touch:

- Pump/motor bearings ____
- Pump casing ____
- Recirculation line ____

CAUTION: If any of the listed pump limits cannot be met, the SI Pump must be stopped from the Control Room and declared INOPERABLE.

4.7 Monitor the following parameters on a periodic basis during pump operation (local): ____

PARAMETER	LIMIT
Vibration Amplitude	Within Limits of TDB Figure 15.2 (when on recirculation)
Pump Flow	Greater than 30 gpm [Ref 7.2.1e]
Lube Oil Pressure	Greater than or equal to 10 psig [Ref. 7.2.1d]

Operator starts the South SI pump

CUE: AEO has verified recirculation flow of 55 gpm within 5 seconds of start.

CUE: AEO reports that all local indications are SAT for pump operation. {Vibration is lower than TDB 15.2 limits; lube oil pressure is $\geq$ 10 psig}

CUE: AEO reports local temperatures are NORMAL and NO excessive hot spots exist.

Operator returns to procedure in effect for raising Accumulator Level at Step 4.7.

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NOTE: South Safety Injection Pump Discharge Header pressure can be monitored in the control room at 2-IPI-265, South SI Pump discharge pressure indicator.

4.7 Slowly open 2-SI-111S, South SI Pump 2-PP-26S Discharge Header Shutoff Valve, to equalize pressure in the discharge line. ____

4.8 Close 2-SI-112S, South SI Pump 2-PP-26S Discharge Drain & Leakby Shutoff Valve. ____

4.9 Open 2-IRV-60, SI Pumps Disch to Accum Fill Line. ____

4.10 **[Current TS]** Declare the accumulator indicated in Step 4.1 inoperable **AND** enter Tech Spec 3.5.1 Action Item b.

[Improved TS] Declare the accumulator indicated in Step 4.1 inoperable **AND** enter Tech Spec 3.5.1 Condition B.

Time entered: _____ Date: _____ ____

NOTE: While filling an accumulator, all other accumulator levels should be monitored.

4.11 Open fill valve for accumulator to be filled **AND** record start time in Control Room Log (N/A valves not used):

- 2-IRV-111, Accum 1 Fill Line ____
- 2-IRV-121, Accum 2 Fill Line ____
- 2-IRV-131, Accum 3 Fill Line ____
- 2-IRV-141, Accum 4 Fill Line ____

Operator directs AEO to slowly OPEN valve 2-SI-111S.
CUE: AEO reports valve 2-SI-111S is OPEN.

Operator directs AEO to CLOSE valve 2-SI-112S
CUE: AEO reports valve 2-SI-112S is CLOSED.

Operator directs AEO to OPEN valve 2-IRV-60.
(**NOTE**: When the Aux Tour AEO is directed to OPEN 2-IRV-60, then BOOTH Operator must enter **MRF SIR01** to **OPEN**)

CUE: AEO reports 2-IRV-60 is OPEN

CUE: STA will enter time and date of Tech Spec entry.

CUE: US directs you to fill the No. 1 Accumulator to 940 ft^3

CT: Operator OPENs valve: 2-IRV-111

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Adjusting the Level of an Accumulator			
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4.12 **IF** regulating accumulator pressure during fill, **THEN** perform the following:

4.12.1 Open the nitrogen supply to the accumulator being filled (N/A valves not used):

- 2-IRV-112, Accum 1 Nitrogen Supply ____
- 2-IRV-122, Accum 2 Nitrogen Supply ____
- 2-IRV-132, Accum 3 Nitrogen Supply ____
- 2-IRV-142, Accum 4 Nitrogen Supply ____

4.12.2 Throttle 2-GRV-341, N_2 Vent from Accum Tanks, as necessary to regulate accumulator pressure. ____

4.13 **WHEN** the required accumulator level is reached, **THEN** verify the following valves closed:

- 2-IRV-111, Accum 1 Fill Line ____
- 2-IRV-121, Accum 2 Fill Line ____
- 2-IRV-131, Accum 3 Fill Line ____
- 2-IRV-141, Accum 4 Fill Line ____
- 2-IRV-112, Accum 1 Nitrogen Supply ____
- 2-IRV-122, Accum 2 Nitrogen Supply ____
- 2-IRV-132, Accum 3 Nitrogen Supply ____
- 2-IRV-142, Accum 4 Nitrogen Supply ____
- 2-GRV-341, N_2 Vent from Accum Tanks ____

CT: Operator should CLOSE valve: 2-IRV-111
{Accumulator No. 1 has reached 940 ft^3 [$\pm$ 5]

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Adjusting the Level of an Accumulator			
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4.14 Independently verify the following valves closed:

- 2-IRV-111, Accum 1 Fill Line ____
- 2-IRV-121, Accum 2 Fill Line ____
- 2-IRV-131, Accum 3 Fill Line ____
- 2-IRV-141, Accum 4 Fill Line ____
- 2-IRV-112, Accum 1 Nitrogen Supply ____
- 2-IRV-122, Accum 2 Nitrogen Supply ____
- 2-IRV-132, Accum 3 Nitrogen Supply ____
- 2-IRV-142, Accum 4 Nitrogen Supply ____
- 2-GRV-341, N_2 Vent from Accum Tanks ____

4.15 Close 2-IRV-60, SI Pumps Disch to Accum Fill Line. ____

IV

4.16 Verify the adjusted accumulator level and pressure is within TS limits. Refer to 2-OHL-4030-SOM-041, Unit 2 Tours - U2 CR M1&2 Shift Cks **OR** 2-OHL-4030-SOM-042, Unit 2 Tours - U2 CR M3&4 Shift Cks for limits. ____

4.17 **[Current TS]** Declare the accumulator indicated in Step 4.1 OPERABLE **AND** exit Tech Spec 3.5.1 Action Item b.

[Improved TS] Declare the accumulator indicated in Step 4.1 OPERABLE **AND** exit Tech Spec 3.5.1 Condition B.

Time exited: _____ Date _____ ____

4.18 Record completion time for raising accumulator level in the Control Room Log. ____

CUE: Independent verification has been performed satisfactory

Operator directs the AEO to CLOSE valve 2-IRV-60
(**NOTE**: When the Aux Tour AEO is directed to CLOSE 2-IRV-60, then BOOTH Operator must enter **MRF SIR01** to **CLOSE**)

CUE: AEO reports valve 2-IRV-60 is CLOSED <u>and</u> Independent verification has been performed satisfactory

CUE: STA will enter the time and date for exiting Tech Spec.

THIS JPM IS COMPLETE.

TASK BRIEFING

You are an extra operator.

A low-level condition has been identified on the Unit 2 No. 1 Accumulator. It has been verified that NO personnel are in Containment.

The Unit Supervisor directs you to raise the No. 1 Accumulator level to 940 ft^3 using the South SI pump, in accordance with Attachment 3 of 02-OHP 4021.008.004.

The Starting Team is standing by to start the South SI pump in accordance with 02-OHP-4021-008-007 and to assist with Local Operations.

NRC2006-Sim03

TITLE	**Maximize Containment Cooling**	**REVISION**	**0**
PROGRAM	**Initial Licensed Operator (ILT)**	**TIME**	**12 Minutes**

SCOPE OF REVISION: New Issue

			DATE:
AUTHOR	**Name:**	Max Bailey	
	Signature:		
FACILITY REVIEWER	**Name:**		
	Signature:		
		Facility Supervisor / Manager	

References

02-OHP-4021-028-001, Rev. 10 Containment Ventilation

Tasks

Task: 0280560101 Operate Lower Containment Ventilation
0280570101 Operate Upper Containment Ventilation

K/A CROSS REFERENCE: 022 A4.01 Ability to manually operate and/or monitor in the control room CCS fans.
K/A IMPORTANCE: RO 3.6 SRO 3.6

Evaluation Setting

Simulator

Handouts

Task Briefing
Copy of 02-OHP-4021-028-001

Attachments

None

Simulator Setup

1. Initialize the Simulator to full power IC 982 (IC28)
2. Verify Containment Ventilation Alignment as follows:

Upper vent fans	Lower vent fans (A)	Lower vent fans (B)
• 2-HV-CUV-1 - OFF • 2-HV-CUV-2 - ON • 2-HV-CUV-3 - ON • 2-HV-CUV-4 - ON	• 2-HV-CLV-1A - ON • 2-HV-CLV-2A - OFF • 2-HV-CLV-3A - ON • 2-HV-CLV-4A – ON	• 2-HV-CLV-1B - ON • 2-HV-CLV-2B - OFF • 2-HV-CLV-3B - ON • 2-HV-CLV-4B - ON

3. Close 2-WCR-920/922 NESW to HV-CUV-1
4. Close 2-WCR-904/906 NESW to HV-CLV-2A

Task Objectives/Standards

Aligns NESW and Starts all 8 Lower Containment Ventilation Fans and all 4 Upper Containment Ventilation Fans IAW 02-OHP-4021-028-001, Containment Ventilation, while observing all applicable precautions and limitations and procedural steps.

Task Briefing

Your are the Extra RO. Unit 2 is in MODE 3.

The Unit Supervisor directs you to maximize Containment Cooling by aligning ALL required NESW supply/return valves and starting ALL idle Upper and Lower Containment Ventilation Fans in accordance with 02-OHP-4021-028-001, Containment Ventilation

Reference	02-OHP-4021-028-001	Rev. 10	Page 5 of 18
Containment Ventilation			

4 **DETAILS**

4.1 Upper Containment Ventilation System Normal Operation:

4.1.1 Operating Upper Containment Ventilation Fans as follows:

a. **IF** desired to place NESW in service, **THEN** open applicable NESW supply and return valves:

FAN	NESW SUPPLY	NESW RETURN
2-HV-CUV-1	2-WCR-920 2-WCR-921	2-WCR-922 2-WCR-923
2-HV-CUV-2	2-WCR-925 2-WCR-924	2-WCR-927 2-WCR-926
2-HV-CUV-3	2-WCR-929 2-WCR-928	2-WCR-931 2-WCR-930
2-HV-CUV-4	2-WCR-932 2-WCR-933	2-WCR-934 2-WCR-935

b. Place the associated control switch in the desired position (Fan 1, Fan 1 & 4, Fan 4 or OFF) to operate or secure the following fans:

- 2-HV-CUV-1, No. 1 Upper Containment Ventilation Unit.
- 2-HV-CUV-4, No. 4 Upper Containment Ventilation Unit.

c. Place the associated control switch in the desired position (Fan 2, Fan 2 & 3, Fan 3 or OFF) to operate or secure the following fans:

- 2-HV-CUV-2, No. 2 Upper Containment Ventilation Unit.
- 2-HV-CUV-3, No. 3 Upper Containment Ventilation Unit.

4.1.2 **IF** desired to isolate NESW flow through upper containment ventilation unit(s), **THEN**, perform the following:

a. Contact Chemistry for minimum flow requirements.

NOTE: Provide candidate a working copy of 02-OHP-4021-028-001, Containment Ventilation.

CUE: If asked, all procedural precautions and limitations have been verified as met. A Pre-Job Brief has been performed.

CT: Opens 2-WCR-920/922

CT: Places Switch in the Fan 1 and 4 Position

Verifies Switch in the Fan 2 and 3 Position

This Step is N/A per direction

Reference	02-OHP-4021-028-001	Rev. 10	Page 6 of 18
Containment Ventilation			

b. Close applicable NESW return valve(s):

FAN	NESW RETURN
2-HV-CUV-1	2-WCR-923
2-HV-CUV-2	2-WCR-927
2-HV-CUV-3	2-WCR-931
2-HV-CUV-4	2-WCR-935

4.1.3 **IF** the Unit is in MODES 1, 2, 3 or 4, **THEN** maintain normal operating temperature range (between 75°F and 90°F) as follows:

a. Maintain the desired number of fans, typically three Upper Containment Ventilation Fans running per Step 4.1.1.

b. **IF** placing Upper Containment Ventilation Cooler controls in AUTO, **THEN** adjust regulating valves' setpoint to maintain normal operating temperature range.

- 2-WRV-922, NESW to 2-HV-CUV-1.
- 2-WRV-926, NESW to 2-HV-CUV-2.
- 2-WRV-930, NESW to 2-HV-CUV-3.
- 2-WRV-934, NESW to 2-HV-CUV-4.

c. **IF** placing Upper Containment Ventilation Cooler controls in MANUAL, **THEN**:

1. Record temperatures per Data Sheet No. 1, Containment Air Temperature Monitoring.
2. Adjust regulating valves' position to maintain normal operating temperature range.
   - 2-WRV-922, NESW to 2-HV-CUV-1.
   - 2-WRV-926, NESW to 2-HV-CUV-2.
   - 2-WRV-930, NESW to 2-HV-CUV-3.
   - 2-WRV-934, NESW to 2-HV-CUV-4.

CUE: IF requested, the AEO at the CAS Panel reports:

· Cooler controls in AUTO and maintaining temperature

· Heater controls in AUTO and maintaining temperature

This Step is N/A

Reference	02-OHP-4021-028-001	Rev. 10	Page 7 of 18
Containment Ventilation			

d. **IF** placing Upper Containment Ventilation Heater controls in AUTO, **THEN** check Upper Containment Ventilation Heaters – ENERGIZE AT 75°F.

- **IF** temperature is not below 75°F, **THEN** verify heater controls in AUTO.

FANS	FIRST STAGE ELECTRIC HEATER	SECOND STAGE ELECTRIC HEATER
2-HV-CUV-1	2-HV-CUV-1-EH1	2-HV-CUV-1-EH2
2-HV-CUV-2	2-HV-CUV-2-EH1	2-HV-CUV-2-EH2
2-HV-CUV-3	2-HV-CUV-3-EH1	2-HV-CUV-3-EH2
2-HV-CUV-4	2-HV-CUV-4-EH1	2-HV-CUV-4-EH2

This Step is N/A

e. **IF** controlling Upper Containment Ventilation Heaters in MANUAL, **THEN**:

1. Record temperatures per Data Sheet No. 1, Containment Air Temperature Monitoring.

2. Verify Upper Containment Ventilation Heaters are – ENERGIZED AT 75°F.

- **IF** temperature is not below 75°F, **THEN** verify heater controls in MANUAL.

NOTE: NRC Commitment #2314 requires at least one upper containment ventilation fan available while operating in a reduced inventory condition with irradiated fuel in the reactor vessel. [Ref. 6.2.11]

4.1.4 **IF** the Unit is in MODES 5 or 6, **THEN** maintain normal operating temperature range (between 65°F and 90°F) as follows:

This Step is N/A

a. Maintain desired number of Upper Containment Ventilation Fans running per Step 4.1.1 for personnel habitability.

b. **IF** desired for personnel habitability, **THEN**:

1. De-energize Upper Containment Heaters (i.e., place controls to OFF).

2. Record temperatures per Data Sheet No. 1, Containment Air Temperature Monitoring.

Reference	02-OHP-4021-028-001	Rev. 10	Page 8 of 18
Containment Ventilation			

NOTE:
- There are two Lower Containment Vent Fans on each control switch. The two fans are in opposite fan rooms.
- NRC Commitment #2314 requires at least two lower containment ventilation fans available while operating in a reduced inventory condition with irradiated fuel in the reactor vessel. [Ref. 6.2.11]

4.2 Lower Containment Ventilation System Normal Operation:

4.2.1 Maintain the desired number of fans, typically at least three ventilation fans in each fan room (six total):

a. Place the associated control switches in the desired position to operate or secure the following fans:

- Positions: (Fan 1A, Fan 1A & 3A, Fan 3A, or OFF)
  - 2-HV-CLV-1A, CLV Quad No. 1 Exhaust Fan 'A'.
  - 2-HV-CLV-3A, CLV Quad No. 3 Exhaust Fan 'A'.
- Positions: (Fan 1B, Fan 1B & 3B, Fan 3B, or OFF)
  - 2-HV-CLV-1B, CLV Quad No. 1 Exhaust Fan 'B'.
  - 2-HV-CLV-3B, CLV Quad No. 3 Exhaust Fan 'B'.
- Positions: (Fan 2A, Fan 2A & 4A, Fan 4A, or OFF)
  - 2-HV-CLV-2A, CLV Quad No. 2 Exhaust Fan 'A'.
  - 2-HV-CLV-4A, CLV Quad No. 4 Exhaust Fan 'A'.
- Positions: (Fan 2B, Fan 2B & 4B, Fan 4B, or OFF)
  - 2-HV-CLV-2B, CLV Quad No. 2 Exhaust Fan 'B'.
  - 2-HV-CLV-4B, CLV Quad No. 4 Exhaust Fan 'B'.

Verifies Switch in the Fan 1A & 3A Position

Verifies Switch in the Fan 1B & 3B Position

CT: Places Switch in the Fan 2A & 4A Position

CT: Places Switch in the Fan 2B & 4B Position

Reference	02-OHP-4021-028-001	Rev. 10	Page 9 of 18
Containment Ventilation			

4.2.2 **IF** desired to place NESW in service, **THEN** open applicable NESW supply and return valves:

FANS	NESW SUPPLY	NESW RETURN
2-HV-CLV-1A	2-WCR-900	2-WCR-902
2-HV-CLV-1B	2-WCR-901	2-WCR-903
2-HV-CLV-2A	2-WCR-904	2-WCR-906
2-HV-CLV-2B	2-WCR-905	2-WCR-907
2-HV-CLV-3A	2-WCR-908	2-WCR-910
2-HV-CLV-3B	2-WCR-909	2-WCR-911
2-HV-CLV-4A	2-WCR-912	2-WCR-914
2-HV-CLV-4B	2-WCR-913	2-WCR-915

4.2.3 **IF** placing Lower Containment Ventilation Cooler controls in AUTO, **THEN** adjust regulating valves' setpoint to maintain the following normal operating temperature ranges:

a. In MODES 1, 2, 3, or 4, the Lower Containment normal operating range is 75°F to 110°F.

-OR-

b. In MODES 5 or 6, the Lower Containment normal operating range is 65°F to 110°F.

- 2-WRV-902, NESW to 2-HV-CLV-1.
- 2-WRV-906, NESW to 2-HV-CLV-2.
- 2-WRV-910, NESW to 2-HV-CLV-3.
- 2-WRV-914, NESW to 2-HV-CLV-4.

4.2.4 **IF** placing Lower Containment Ventilation Cooler controls in MANUAL, **THEN**:

a. Record temperatures per Data Sheet No. 1, Containment Air Temperature Monitoring.

CT: Opens 2-WCR-904/906

Operator reports completion of Containment Cooling lineup

This Step is N/A

THIS JPM IS COMPLETE"

Task Briefing

Your are the Extra RO. Unit 2 is in MODE 3.

The Unit Supervisor directs you to maximize Containment Cooling by aligning ALL required NESW supply/return valves and starting ALL idle Upper and Lower Containment Ventilation Fans in accordance with 02-OHP-4021-028-001, Containment Ventilation

NRC2006
SIM04

TITLE	**Re-energize RCP Bus from Reserve Feed**	**REVISION**	**0**
PROGRAM	**Initial Licensed Operator (ILT)**	**TIME**	**20 Minutes**

SCOPE OF REVISION: New Issue

			DATE:
AUTHOR	**Name:**	Max Bailey	
	Signature:		
FACILITY REVIEWER	**Name:**		
	Signature:		
		Facility Supervisor / Manager	

REFERENCES

02-OHP-4023-SUP-002, Rev. 6 Restoration of Reserve Power to 4KV Buses

Tasks

Task: EOP0390501 Restore Offsite Power to all AC buses using SUP 002.

K/A CROSS REFERENCE: 062 A4.07
K/A IMPORTANCE: RO 3.1 SRO 3.1

Evaluation Setting

Simulator

Handouts

Task Briefing
Copy of 02-OHP-4023-SUP-002, Attachment A

SIMULATOR SETUP

Reset to Shutdown IC982 (IC28)
Simulator Setup:

- Perform a manual reactor trip then insert Malfunction:
  ED03A & ED03B to de-energized the 2A, 2B, 2C, and 2D buses.
- Perform actions of E-0 and ES-0.1 through Step 8.
- Delete Malfunctions ED03A & ED03B
- Reset TR201AB and TR201CD 86 Relays
- MRF EDR034 to TRIP then to RESET to restore Lighting
- MRF EDR047 to TRIP then to RESET to restore Transformer Oil & Fan Cooling
- MRF EDR048 to TRIP then to RESET to restore Transformer Oil & Fan Cooling
- Perform SUP002 Att. B to restore power to 2C and 2D buses.

Task Objectives/Standards

Re-energize RCP buses 2A & 2B from Reserve Feed in accordance with Attachment A of 02-OHP-4023-SUP-002, Restoration of Reserve Power to 4KV Buses

Task Briefing

You are the Extra RO

The unit is recovering from a loss of Offsite Power with RCP Buses 2A and 2B still de-energized.

The Unit Supervisor directs you to re-energize RCP buses 2A & 2B from Reserve Feed in accordance with Attachment A of 02-OHP-4023-SUP-002, Restoration of Reserve Power to 4KV Buses

The Shift Manager has received word from Fort Wayne that the Reserve Transformers TR4 and TR5 are energized and available.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Attachment A **Restoration Of Reserve Feed To Buses 2A and 2B**	
1.	**Check 34.5KV Bus #1 (Supply to U1 and U2 RSRV Power CB 12AB) - ENERGIZED**	Return to Supplement Body, Step 3 (Page 4).
2.	**Check "TR201AB HEA Operated" Annunciator - CLEAR** • Panel 219, Drop 93	Inform Unit Supervisor that reserve feed is **NOT** available to buses 2A and 2B, and return to Supplement Body, Step 3 (Page 4).
3.	**Verify The Following Breakers - OPEN WITH GREEN TARGET** • 2A5, reserve feed supply to bus 2A • 2B5, reserve feed supply to bus 2B	
4.	**Request UNIT 1 To Verify The Following Breakers - OPEN WITH GREEN TARGET** • 1A5, reserve feed supply to bus 1A • 1B5, reserve feed supply to bus 1B	
5.	**Obtain Approval From FWOC To Close U1 And U2 Reserve Power CB 12AB**	
6.	**Request UNIT 1 To Place U1 And U2 Reserve Power CB 12AB In CLOSE And Verify RED Target**	

(Attachment A, page 1 of 10)

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{CT: Critical Task**}**

Operator Verifies 34.5 KV Bus #1 is energized

Operator Verifies Panel 219 Drop 93 is NOT lit

CT: Operator Verifies 2A5 & 2B5 breakers are OPEN with GREEN targets.

Operator verifies UNIT 1 breakers 1A5 & 1B5 are OPEN with a GREEN target.

CUE: Unit 1 has verified 1A5 & 1B5, Reserve Feed Supply to Buses 1A and 1B are OPEN with a GREEN Target.

CUE: Ft. Wayne Operations Center has given approval to close CB 12AB.

Operator verifies UNIT 1 breaker 12AB is CLOSED with a RED target.

CUE: Unit 1 has placed breaker 12AB in CLOSE and verified a RED target.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Attachment A **Restoration Of Reserve Feed To Buses 2A and 2B**	
7.	**Close U1 And U2 Reserve Power CB 12AB**	
8.	**Check TR201AB Potential - ALL PHASES ENERGIZED**	Perform the following: a. Inform Unit Supervisor that all phases of TR201AB are **NOT** energized. b. Open U1 And U2 Reserve Power CB 12AB. c. Return to Supplement Body, Step 3 (Page 4).
9.	**Inform UNIT 1 That U1 And U2 Reserve Power CB 12AB Is Closed**	
10.	**Prepare For Restoration Of Reserve Feed To Buses 2A and 2B:**	
	a. Check the following annunciators - CLEAR • "TR2AB 4KV CB 2A7 Overload Trip" (Panel 219, Drop 71) • "TR201AB Emer 4KV CB 2A5 Overload Trip" (Panel 219, Drop 91)	a. Inform Unit Supervisor that bus 2A can **NOT** be energized and return to Supplement Body, Step 3 (Page 4).

(Step 10 Continued On Next Page)

(Attachment A, page 2 of 10)

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CT: Operator Places CB 12AB to CLOSE.
CUE: (If asked) US acknowledges closing 12AB and plant announcement has been made.

Operator Verifies TR201AB is Energized on All Phases

Operator Informs U1 that 12AB, U1 & U2 Reserve Power CB is Closed
CUE: Acknowledge CB 12AB is closed

Operator Verifies that Panel 219 Drops 71 & 91 are NOT LIT.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Attachment A
Restoration Of Reserve Feed To Buses 2A and 2B

(Step 10 Continued From Previous Page)

b. Check the following annunciators - CLEAR

- "TR2AB 4KV CB 2B7 Overload Trip" (Panel 219, Drop 72)
- "TR201AB Emer 4KV CB 2B5 Overload Trip" (Panel 219, Drop 92)

b. Inform Unit Supervisor that bus 2B can **NOT** be energized and return to Supplement Body, Step 3 (Page 4).

c. Verify the following breakers - OPEN WITH GREEN TARGET

- 2A7, main feed supply to bus 2A
- 2B7, main feed supply to bus 2B
- T21A9, supply breaker to bus T21A
- T21B1, supply breaker to bus T21B
- 2B6, supply breaker to bus 21BMC
- Middle heater drain pump
- RCP 1
- RCP 4

(Step 10 Continued On Next Page)

(Attachment A, page 3 of 10)

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Operator Verifies that Panel 219 Drops 72 and 92 are NOT LIT.

CT: Operator Verifies breakers are OPEN with a GREEN target for Bus 2A & 2B equipment
(**NOTE:** Place breakers to Trip to ensure GREEN Target)

{**NOTE**: When operator attempts to verify RCP 1 & 4 breakers OPEN with GREEN target, then}
CUE: The RO has verified RCP 1 & 4 are Open with a Green Target.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Attachment A
Restoration Of Reserve Feed To Buses 2A and 2B

(Step 10 Continued From Previous Page)

d. Verify the following pumps - TRIPPED **AND** IN NEUTRAL

- Middle hotwell pump
- Middle condensate booster pump
- Main turbine turning gear motor

e. Verify the following pumps - TRIPPED **AND** IN TRIP

- Circ water pump 22
- Circ water pump 23

f. Defeat breaker interlocks by opening the following knife switches (Panel G):

- Generator Test Switch No. 2, Knife 3 (Close 2A5)
- Generator Test Switch No. 2, Knife 4 (Close 2B5)
- Generator Test Switch No. 5, Knife 3 (Close 2A5)
- Generator Test Switch No. 5, Knife 4 (Close 2B5)

(Attachment A, page 4 of 10)

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CT: Operator Verifies breakers OPEN for Bus 2A & 2B equipment
(**NOTE**: Ensure switches are taken to TRIP then placed in Neutral)

{**NOTE**: When the operator attempts to verify CW pumps tripped, then}
CUE: The BOP Operator has verified CW Pumps #22 & #23 are TRIPPED and Control Switches are in TRIP

CT: Panel G Switch #2-3 is placed in OPEN.

CT: Panel G Switch #2-4 is placed in OPEN.

CT: Panel G Switch #5-3 is placed in OPEN.

CT: Panel G Switch #5-4 is placed in OPEN.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Attachment A
Restoration Of Reserve Feed To Buses 2A and 2B

11. Energize Bus 2A:

a. Place 2A5 synch selector in MANUAL

b. Check aux buses run volts - RESERVE FEED VOLTAGE INDICATED

c. Place 2A5, reserve feed supply to bus 2A, control switch in CLOSE

d. Check "Synch Permissives Met" - LIT

d. Perform the following:

1) Place 2A5 synch selector in OFF.

2) Place 2A5 synch selector in MANUAL.

3) Check aux buses run volts indicates reserve feed voltage.

4) Place 2A5, reserve feed supply to bus 2A, control switch in CLOSE.

5) Check "Synch Permissives Met" is lit.

IF synch permissive is **NOT** met,
THEN inform Unit Supervisor and go to Step 11.h (Page 15).

e. Momentarily place aux buses synchronize master close in CLOSE

(Step 11 Continued On Next Page)

(Attachment A, page 5 of 10)

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CT: Operator places 2A5 Synch selector to MANUAL

Operator verifies aux buses run volts on Reserve Feed Voltage Indicator

CT: Operator places 2A5 Control switch in CLOSE and Verifies SYNCH Permissives white light LIT

Operator verifies WHITE light LIT for Synch Permissives Met.

Operator announces closing 2A5.
CUE: US Acknowledges closing 2A5 and plant announcement has been made

CT: Operator places Synch Master switch to CLOSE

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Attachment A
Restoration Of Reserve Feed To Buses 2A and 2B

(Step 11 Continued From Previous Page)

f.	Check 2A5, reserve feed supply to bus 2A - CLOSED	f. Perform the following: 1) Place 2A5 synch selector in OFF. 2) Place 2A5 synch selector in MANUAL. 3) Check aux buses run volts indicates reserve feed voltage. 4) Place 2A5, reserve feed supply to bus 2A, control switch in CLOSE. 5) Check "Synch Permissives Met" is lit. **IF** synch permissive is **NOT** met, **THEN** inform Unit Supervisor and go to Step 11.h (Page 15). 6) Momentarily place aux buses synchronize master close in CLOSE. 7) Check 2A5, reserve feed supply to bus 2A, is closed. **IF** 2A5, reserve feed supply to bus 2A, will **NOT** close, **THEN** inform Unit Supervisor and go to Step 11.h (Page 15).

Operator verifies 2A5 is closed

(Step 11 Continued On Next Page)

(Attachment A, page 6 of 10)

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Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Attachment A
Restoration Of Reserve Feed To Buses 2A and 2B

(Step 11 Continued From Previous Page)

g. Check Bus 2A potential - **ALL** PHASES ENERGIZED

g. Perform the following:

1) Inform Unit Supervisor that all phases of Bus 2A are **NOT** energized.

2) Open 2A5, reserve feed supply to bus 2A.

h. Place 2A5 synch selector in OFF

12. Energize Bus 2B:

a. Place 2B5 synch selector in MANUAL

b. Check aux buses run volts - RESERVE FEED VOLTAGE INDICATED

c. Place 2B5, reserve feed supply to bus 2B, control switch in CLOSE

(Step 12 Continued On Next Page)

(Attachment A, page 7 of 10)

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Operator verifies all phases of Bus 2A are energized.

Operator places 2A5 Synch selector switch to OFF

CUE: (If asked) US acknowledges 2A Bus energized.

CT: Operator places 2B5 Synch selector to MANUAL

Operator verifies aux buses run volts on Reserve Feed Voltage indication.

CT: Operator places 2B5 Control switch in CLOSE

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Attachment A
Restoration Of Reserve Feed To Buses 2A and 2B

(Step 12 Continued From Previous Page)

d. Check "Synch Permissives Met" - LIT

~~d. Perform the following:~~

1) Place 2B5 synch selector in OFF.

2) Place 2B5 synch selector in MANUAL.

3) Check aux buses run volts indicates reserve feed voltage.

4) Place 2B5, reserve feed supply to bus 2B, control switch in CLOSE.

5) Check "Synch Permissives Met" is lit.

IF synch permissive is **NOT** met,
THEN inform Unit Supervisor and go to Step 12.h (Page 18).

e. Momentarily place aux buses synchronize master close in CLOSE

(Step 12 Continued On Next Page)

(Attachment A, page 8 of 10)

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Operator verifies SYNCH Permissives white light LIT

Operator announces closing 2B5.
CUE: US Acknowledges closing 2B5 and plant announcement has been made

CT: Operator places Synch Master switch to CLOSE

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	Attachment A **Restoration Of Reserve Feed To Buses 2A and 2B** *(Step 12 Continued From Previous Page)*	
	f. Check 2B5, reserve feed supply to bus 2B - CLOSED	f. Perform the following: 1) Place 2B5 synch selector in OFF. 2) Place 2B5 synch selector in MANUAL. 3) Check aux buses run volts indicates reserve feed voltage. 4) Place 2B5, reserve feed supply to bus 2B, control switch in CLOSE. 5) Check "Synch Permissives Met" is lit. **IF** synch permissive is **NOT** met, **THEN** inform Unit Supervisor and go to Step 12.h (Page 18). 6) Momentarily place aux buses synchronize master close in CLOSE. 7) Check 2B5, reserve feed supply to bus 2B, is closed. **IF** 2B5, reserve feed supply to bus 2B, will **NOT** close, **THEN** inform Unit Supervisor and go to Step 12.h (Page 18).
	(Step 12 Continued On Next Page)	

(Attachment A, page 9 of 10)

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Operator verifies 2B5 is closed

Number:	Title:	Revision Number:
02-OHP-4023 SUP-002	RESTORATION OF RESERVE POWER TO 4KV BUSES	6

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

Attachment A
Restoration Of Reserve Feed To Buses 2A and 2B

(Step 12 Continued From Previous Page)

g. Check Bus 2B potential - **ALL** PHASES ENERGIZED

g. Perform the following:

1) Inform Unit Supervisor that all phases of Bus 2B are **NOT** energized.

2) Open 2B5, reserve feed supply to bus 2B.

h. Place 2B5 synch selector in OFF

13. Close The Following Knife Switches (Panel G):

- Generator Test Switch No. 2, Knife 3 (Close 2A5)
- Generator Test Switch No. 2, Knife 4 (Close 2B5)
- Generator Test Switch No. 5, Knife 3 (Close 2A5)
- Generator Test Switch No. 5, Knife 4 (Close 2B5)

14. Return To Supplement Body, Step 3 (Page 4)

-END OF ATTACHMENT-

(Attachment A, page 10 of 10)

Page 18 of 88

Operator verifies all phases of Bus 2B are energized.

Operator places 2B5 Synch selector switch to OFF

Operator places knife switches on Panel G in CLOSE

CT: Panel G Switch #2-3 is placed in CLOSE.

CT: Panel G Switch #2-4 is placed in CLOSE.

CT: Panel G Switch #5-3 is placed in CLOSE.

CT: Panel G Switch #5-4 is placed in CLOSE.

Operator reports completion of SUP-002.

THIS JPM IS COMPLETE

NRC2006-SIM04

Task Briefing

You are the Extra RO

The unit is recovering from a loss of Offsite Power with RCP Buses 2A and 2B still de-energized.

The Unit Supervisor directs you to re-energize RCP buses 2A & 2B from Reserve Feed in accordance with Attachment A of 02-OHP-4023-SUP-002, Restoration of Reserve Power to 4KV Buses

The Shift Manager has received word from Fort Wayne that the Reserve Transformers TR4 and TR5 are energized and available.

NRC2006
SIM05

TITLE	**Unit 2 CR Ventilation aligned for Unit 1 SI (ALT)**	**REVISION**	**0**
PROGRAM	**Initial Licensed Operator (ILT)**	**TIME**	**15 Minutes**

SCOPE OF REVISION: New Issue (NRC2002-SIM)

			DATE:
AUTHOR	**Name:**	Max Bailey	
	Signature:		
FACILITY REVIEWER	**Name:**		
	Signature:		
		Facility Supervisor / Manager	

References

02-OHP-4021-028-014, Rev. 18	Operation of Control Room AC and Pressurization/Cleanup/Filter System
02-OHP-4024-201, Rev. 13	Annunciator #201 Response Plant Fire System

Tasks

Task: EOP0230501 Verify proper equipment response following Safety Injection actuation.
0660560801 Respond to CR Pressurization Charcoal Filter fire

K/A CROSS REFERENCE: APE 067AA1.05 Ability to operate and/or monitor the following as they apply to the Plant Fire on site for control room ventilation system
2.1.20 Ability to execute procedure steps

K/A IMPORTANCE:	RO	3.0	SRO	3.1
	RO	4.3	SRO	4.2

Evaluation Setting

Simulator

Handouts

Task Briefing
Copy of 02-OHP-4021-028-014, Attachment 14
Copy of 02-OHP-4024-201 Drops 41 & 59 (Wait until Alarms are Lit)

Simulator Setup

Initialize at full power IC 980 (IC 28)

Assign Event trigger file **ECRCleanupdmpr2partialopen** to Trigger **3**
Verify/Assign Overides to trigger 3 **IOV AN01(059) Crywolf** and **IOV AN01(041) Crywolf**.

NOTE: Booth Operator should verify that after the operator partially opens a CR Pressurization Cleanup Intake damper (either 2-HV-ACR-DA-2 or 2A) the trigger initiates overrides for annunciator panel 201 drop 59 & 41, **IOV AN01(059) Crywolf** and **IOV AN01(041) Crywolf**.
These Alarms may be triggered with a 30 second delay from the Pressurization Fan start using:
Assign Event trigger file **ECRCleanupdmpr2partialopen** to Trigger **3**

ECRCleanupdmpr2partialopen file contains:
ZLO101ACRDA2[3] == -1 || ZLO101ACRDA2A[3] == -1

Task Objectives/Standards

Align the Unit 2 CR AC and Pressurization system for a Unit 1 SI signal, observing procedure steps and precautions and limitations of 02-OHP-4021-028-014.

In addition, due to a subsequent fire condition in the charcoal bed, the operator should respond and mitigate the conditions by implementing the actions of the Alarm Response Procedure, 02-OHP-4024-201, Drop 59.

Task Briefing

You are the Extra RO

A Safety Injection (SI) has occurred on Unit 1.

The US directs you to verify that the Unit 2 Control Room Ventilation system is aligned for the Unit 1 SI signal by performing Attachment 14 of 02-OHP-4021-028-014.

REFERENCE	02-OHP-4021-028-014	Rev. 18	Page 63 of 76
Operation of the Control Room Air Conditioning and Pressurization/Cleanup Filter Systems			
Attachment 14	Verifying Control Room Ventilation System Aligned for Unit 1 Safety Injection Signal		Pages: 63 - 66

1 PURPOSE AND SCOPE

1.1 Verify the Control Room ventilation/pressurization system is properly aligned following a safety injection signal from Unit 1.

2 PREREQUISITES

- None

3 PRECAUTIONS AND LIMITATIONS

3.1 This procedure attachment is referenced for use in the Emergency Operating Procedures. Use of this procedure as directed by the EOP series is subject to rules of usage found in OHI-4023, Abnormal/Emergency Operating Procedure User's Guide. [Ref. 7.1.2]

4 DETAILS **INIT**

4.1 Verify only one pressurization fan running (circle running fan):

- 2-HV-ACRF-1, West Ctrl Room Przn System

OR

- 2-HV-ACRF-2, East Ctrl Room Przn System ____

4.2 Verify Control Room vent intake dampers – ISOLATED:

- 2-HV-ACR-DA-1, Control Room Vent Intake Damper ____
- 2-HV-ACR-DA-1A, Control Room Vent Intake Damper ____

4.3 Verify Control Room pressurization intake dampers – ONE PARTIAL OPEN AND ONE CLOSED:

- 2-HV-ACR-DA-2, CR Przn Cln-Up Intake Damper ____
- 2-HV-ACR-DA-2A, CR Przn Cln-Up Intake Damper ____

Evaulator Information

NOTE: the Unit 1 SI signal did not result in the expected realignment of the Unit 2 CR AC and Pressurization system.

The Operator will place all Unit 2 equipment in the required condition.

Shortly after the intake dampers are manually opened, a fire occurs in the control room pressurization charcoal filter bed.

CT: Operator starts only 1 pressurization fan

CT: Operator closes both intake dampers.

CT: Operator selects 1 damper to partial open (other damper remains closed)

NOTE: Trigger 3 initiates override for annunciator panel 201 drop 59 and 41
IOR AN01(059) ON and **IOR AN01(041) ON**

REFERENCE	02-OHP-4021-028-014	Rev. 18	Page 64 of 76
Operation of the Control Room Air Conditioning and Pressurization/Cleanup Filter Systems			
Attachment 14	Verifying Control Room Ventilation System Aligned for Unit 1 Safety Injection Signal		Pages: 63 - 66

4.4 Verify Control Room pressurization clean-up recirc damper – OPEN:

- 2-HV-ACR-DA-3, CR Przn Cln-Up Recirc Damper [NRC Cmmt 1905] _____

4.5 Verify Unit 2 Control Room cable vault hatch – CLOSED:

- 2-HATCH-A624-1, Aux Building El 633 U-2 Control Rm Cable Vault Hatch _____

The Operator Identifies that the fire alarms have annunciated.

CUE: The US directs you to respond to the fire Alarms.

NOTE: Supply the Operator with the Annunciator Response pages for Drops 41 & 59.

These Steps may be NA

Operator verifies damper open

Operator verifies hatch closed by Panel 201 Drop 69 alarm clear **OR** simulates verifying hatch closed in back of Control Room

2-OHP-4024-201

Level of Use: REFERENCE

Drop 59

ANNUNCIATOR #201 RESPONSE: PLANT FIRE SYSTEM

INITIATING DEVICE(S) AEP	Alias	NOMINAL SETPOINT
Fire detection 2-TMS-CF-ACRF, LOCAL/CTRL CAB START Push Button, Selector switch 2-29-CPRF in ISOLATE	2-ZTA-24	170 °F alarm 400 °F operating

CTRL RM PRZN
CHAR FILTER
FIRE OR ABN

1.0 PROBABLE CAUSE(S):

1.1 Fire or overheating in Control Room pressurization charcoal filter.

1.2 Detection circuit trouble.

1.3 Pilot solenoid valve isolation switch in isolate position.

2.0 AUTOMATIC ACTION(S):

2.1 Actuation of the water deluge will:

- Open isolation valve 12-ZMO-10, Yard Fire Hdr to Aux Bldg
- Open isolation valve 12-ZMO-20, Turb Bldg Fire Hdr to Aux Bldg
- Open water valve 2-ZRV-24, Fire Protection water to Control Room Ventilation Unit HV-ACRF Charcoal Filters control valve
- Actuate Annunciator 101, Drop 41
- Actuate Annunciator 201, Drop 41

Page 175 of 292

Operator reviews probable causes

Operator reviews automatic actions

{NOTE: 12-ZMO-10 and 12-ZMO-20 do NOT open}
Operator may OPEN these valves at this time.

2-OHP-4024-201

Level of Use: REFERENCE

Drop 59

CAUTION
A loss of Letdown, Boron Makeup, or spurious closure of the VCT Isolation Valves could result in a LOSS OF VCT SUCTION to the Charging Pumps in a short period of time. The Appendix R analysis credits RCS makeup from the affected Unit's Charging Pumps via the RWST **OR** the unaffected Unit via the CVCS cross-tie.

3.0 OPERATOR ACTION(S):

3.1 Check Alison cabinet on 650 elevation of Auxiliary Building for cause of alarm.

3.2 Check filter housing in the Control Room ventilation equipment room.

3.3 **IF** amber PREALARM lamp is LIT, **THEN**:

3.3.1 Open 2-FP-283, Fire Protection water to Ventilation Unit 2-HV-ACRF Charcoal Filter manual shutoff valve.

3.3.2 Open 2-DR-174 and 2-DR-198, Control Room Ventilation Unit 2-HV-ACRF Drains to Turbine Room Sump shutoff valves.

3.4 **IF** red System Operating lamp is lit, **THEN**:

CAUTION
IF a radiological emergency (LOCA, fuel handling accident) is in progress, then the Control Room pressurization fans shall not be stopped, unless fire or smoke is confirmed.

3.4.1 Place control switches for Control Room Pressurization Fans 2-HV-ACRF1 and 2-HV-ACRF2 in OFF.

3.4.2 Verify 12-ZMO-10, Yard Fire Hdr to Aux Bldg - OPEN.

3.4.3 Verify 12-ZMO-20, Turb Bldg. Fire Hdr to Aux Bldg – OPEN.

3.4.4 Verify 2-ZRV-24, deluge valve to Control Room Pressurization Fan Filter – OPEN.

a. Monitor the ventilation unit to ensure the filter housing is draining as expected, to prevent overfilling and flooding of the ductwork to the Control Room.

Page 176 of 292

Operator directs AEO to 650' of Aux Building

Operator directs another AEO to CR Ventilation Equipment Room

CUE: AEO reports that the **amber** PREALARM and **red** SYSTEM OPERATING lamps are lit

CT: Operator directs AEOs to open 2-FP-283, 2-DR-174, and 2-DR-198

CUE: AEO reports that smoke is observed in the CR ventilation filter housing.

CT: Operator places both CR pressurization fans in stop

CT: Operator opens 12-ZMO-10 (20) with control switch (or verify Open)

Operator directs AEO to verify 2-ZRV-24 opens

CUE: AEOs report that 2-ZRV-24 is open and the filter housing is draining properly.

2-OHP-4024-201

Level of Use: REFERENCE

Drop 59

3.4.5 Sound fire siren.

3.4.6 Notify fire brigade.

3.4.7 Announce the location of the fire on PA and establish fire information line on extension 1801.

3.4.8 When the fire is extinguished:

a. Announce on the PA that the fire is out.

b. **[Current TS]** Ensure requirements of ATR# 2-FP-3 are met.

[Improved TS] Ensure requirements of TRM 8.7.6 are met.

c. Close and seal 2-FP-283.

d. Reset fire system.

e. After filter housing is drained, close 2-DR-174 and 2-DR-198.

3.5 **IF** alarm is spurious, or no fire exists, **THEN** place control switches for both Control Room Pressurization Fans in AUTO.

3.6 **IF** trouble condition exists, **THEN**:

3.6.1 Check power supply to fire system.

3.6.2 Check isolation switch for charcoal filter fire detection system.

4.0 REFERENCE INDEX:

4.1 Source Documents:

4.1.1 AEP Elementary Diagrams: OP-2-98969, OP-2-98966, OP-1-98742

4.1.2 AEP Flow Diagrams: OP-12-5123B, OP-12-5152E

4.1.3 System Description: SD-DCC-FP101

4.1.4 ECP: 1-2-ZO-05

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[**NOTE:** Simulate sounding Fire Alarm and PA announcement}
Operator simulates sounding the Fire Siren and notifies the fire brigade.
CUE: Fire Brigade has been notified.

Operator simulates PA announcement

CUE: SRO / Fire Brigade reports the fire is out

THIS JPM IS COMPLETE.

NRC2006-SIM05

Task Briefing

You are the Extra RO

A Safety Injection (SI) has occurred on Unit 1.

The US directs you to verify that the Unit 2 Control Room Ventilation system is aligned for the Unit 1 SI signal by performing Attachment 14 of 02-OHP-4021-028-014.

NRC2006

SIM06

TITLE	**Perform Turbine Driven AFW Pump Trip & Throttle Valve Operability Surveillance**	**REVISION**	**0**
PROGRAM	**Initial Licensed Operator (ILT)**	**TIME**	**20 Minutes**

SCOPE OF REVISION: New Issue

			DATE:
AUTHOR	**Name:**	Max Bailey	
	Signature:		
FACILITY REVIEWER	**Name:**		
	Signature:		
		Facility Supervisor / Manager	

References

02-OHP-4030-STP-017TV,Rev 10, Turbine Driven AFW Pump Trip & Throttle Valve Operability Test

Task: 0560190201: Perform Turbine Driven AFW Pump Trip & Throttle Valve Operability Surveillance

K/A CROSS REFERENCE: SYS 061 K4.07 Knowledge of AFW design features and/or interlocks which provide for Turbine Trip, including overspeed.

2.1.23 Ability to perform specific system and integrated plant procedures during all modes of plant operation.

K/A IMPORTANCE: RO 3.1 SRO 3.3
RO 3.9 SRO 4.0

Evaluation Setting

Simulator

Handouts

Task Briefing
Copy of 02-OHP-4030-STP-017TV
Stop Watch with Calibration Sticker

Attachments

None

Simulator Setup

Initialize at full power IC 980 (IC28)
Verify prerequisites of controlling procedure are met.

<u>Simulator Booth Operator Action</u>:
MRF FWR037 to 100% - to OPEN 2-FRV-256
MRV FWR037 to 0% - to CLOSE 2-FRV-256

Task Objectives/Standards

Performs TDAFW Trip & Throttle Valve Surveillance, observing all applicable precautions and limitations and procedure steps.

Task Briefing

Your are the Extra RO

The US directs you to Perform 02-OHP-4030-STP-017TV, Turbine Driven AFW Pump Trip & Throttle Valve Operability Surveillance.

The TDAFP has been declared inoperable and LCO 3.7.5 has been entered for this Surveillance. An AEO has been briefed. The AEO has verified the TDAFP is ready for Start and is standing by.

There is No Identified Primary to Secondary leakage.

Continuous	02-OHP-4030-STP-017TV	Rev. 10	Page 5 of 12
Turbine Driven Auxiliary Feed Pump Trip And Throttle Valve Operability Test			

4 DETAILS INIT

4.1 Prerequisites and Precautions & Limitations have been reviewed. ____

4.2 Notify Lab that 2-PP-4, TDAFP is to be run. ____

4.3 Check TDAFP mechanical and electrical trips reset.

- Annun. 213 Drop 50 — NOT LIT. ____
- Annun. 214 Drop 10 — NOT LIT. ____

4.4 Verify the following TDAFP Discharge Valves to the Steam Generators – CLOSED:

- 2-FMO-211, SG 1 Feed From TDAFP. ____
- 2-FMO-221, SG 2 Feed From TDAFP. ____
- 2-FMO-231, SG 3 Feed From TDAFP. ____
- 2-FMO-241, SG 4 Feed From TDAFP. ____

4.5 Align Emergency Leakoff Valve:

4.5.1 Verify 2-FRV-258, TDAFP Emer Leakoff – OPEN. ____

4.5.2 Verify 2-FRV-258 control switch in – AUTO. ____

4.6 Verify 2-FRV-256, TDAFP Test Valve, available.

4.6.1 Check control power available as follows:

- Control Room 2-FRV-256 White Light - LIT. ____
- Local 2-FRV-256 White Light - LIT. ____

4.6.2 Open 2-CA-6530, 50 PSI Control Air to 2-XSO-256 For TDAFP Test Valve 2-FRV-256 Shutoff Valve ____

4.7 Locally open 2-FW-263, TDAFP Test Valve 2-FRV-256 Outlet Shutoff Valve. ____

4.8 Place 2-FRV-256, TDAFP Test Valve control switch in – TEST. ____

NOTE: Provide an annotated copy of 02-OHP-4030-STP-017TV.

CUE: (If Asked) Both the East & West AFW pumps are operable and the US has Entered LCO 3.7.5 for the TDAFW

CUE: Chemistry Lab has been notified of the TDAFP run
CUE: (If Asked) The Starting team is ready for the TDAFP start.

Operator verifies that Panel 213 Drop 50 & Panel 214 Drop 10 are NOT LIT

CT: Operator Holds CS in CLOSE and verifies CLOSED for:

2-FMO-211	Annunciator Panel 213 Drop 29 is LIT
2-FMO-221	Annunciator Panel 213 Drop 39 is LIT
2-FMO-231	Annunciator Panel 214 Drop 19 is LIT
2-FMO-241	Annunciator Panel 213 Drop 29 is LIT

Operator Verifies 2-FRV-258 is in AUTO & OPEN

Operator Verifies 2-FRV-256 White Light is LIT

CUE: AEO reports TDAFP Test Valve 2-FRV-256 White Light is LIT locally.

CUE: AEO reports 2-CA-6530, 50 PSI Control Air to 2-XSO-256 is OPEN

CUE: AEO reports 2-FW-263 TDAFP Test Valve Outlet Shutoff is OPEN

CT: Operator places CS for 2-FRV-256 to TEST.

Continuous	02-OHP-4030-STP-017TV	Rev. 10	Page 6 of 12
Turbine Driven Auxiliary Feed Pump Trip And Throttle Valve Operability Test			

4.9 Locally open 2-FRV-256, TDAFP 2-PP-4 Test Valve. _____

4.10 Start the TDAFP from the Control Room by performing the following:

4.10.1 Record Stopwatch Data.

	Instrument No.	Next due cal date
Primary	_____	___/___/___
Secondary	_____	___/___/___

4.10.2 Open and time 2-QT-506, TDAFP Trip and Throttle Valve from the Control Room.

IST MIN time from TDB fig 19.1	As Found time	IST MAX time from TDB fig 19.1	STOPWATCH (Circle)
_____sec	_____sec	_____sec	Pri/Sec

Acceptance criteria: "As found time" ≤ IST MAX time- Yes / No (Circle)

IF "As found time" is outside the IST Limits THEN immediate retest is NOT permitted according to Precautions & Limitations, step 3.10.

4.10.3 Allow TDAFP speed to stabilize prior to continuing. _____

4.11 Using the trip push button, trip the TDAFP from the Control Room. _____

4.12 After the TDAFP Trip and Throttle Valve tripped, wait greater than or equal to 30 seconds and run the TDAFP Trip and Throttle Valve (T&TV) - CLOSED. _____

4.13 Locally close 2-FW-263, TDAFP Test Valve 2-FRV-256 Outlet Shutoff Valve. _____

4.14 Locally close 2-FRV-256, TDAFP 2-PP-4 Test Valve. _____

4.15 Close 2-CA-6530. _____

IV

4.16 Place 2-FRV-256, TDAFP 2-PP-4 Test Valve control switch in – NORMAL. _____

Operator Directs AEO to Open 2-FRV-256.

CUE: ***(Simulator Booth Operator = MRF FWR037 to 100%)***
AEO reports that 2-FRV-256 is Open and the TDAFP ready for Starting

CT: Operator starts TDAFP (Place 2-QT-506 to OPEN) and times opening with Stop Watch

{**NOTE**: US Acknowledges TDAFP start and annunciator clear.}

Operator Records Start Time and verifies it is Acceptable.

CT: After the TDAFP speed has stabilized, Operator Depresses the TDAFP TRIP PUSHBUTTON

CT: Operator runs TDAFP Trip & Throttle Valve CLOSED after 30 seconds. (Place 2-QT-506 to CLOSED)

Operator Directs AEO to CLOSE 2-FW-263, 2-FRV-256 & 2-CA-6530.

CUE: AEO reports 2-FW-263 TDAFP Test Valve Outlet Shutoff is CLOSED
CUE: ***(Simulator Booth Operator = MRF FWR037 to 0%)***
AEO reports that 2-FRV-256 is CLOSED
CUE: AEO reports 2-CA-6530, 50 PSI Control Air to 2-XSO-256 is CLOSED and has been Independently verified Closed.

CT: Operator places CS for 2-FRV-256 to NORMAL.

Continuous	02-OHP-4030-STP-017TV	Rev. 10	Page 7 of 12
Turbine Driven Auxiliary Feed Pump Trip And Throttle Valve Operability Test			

4.17 Verify the following TDAFP Discharge Valves to the Steam Generators – OPEN:

- 2-FMO-211, SG 1 Feed From TDAFP. _____ _____ IV
- 2-FMO-221, SG 2 Feed From TDAFP. _____ _____ IV
- 2-FMO-231, SG 3 Feed From TDAFP. _____ _____ IV
- 2-FMO-241, SG 4 Feed From TDAFP. _____ _____ IV

4.18 Check TDAFP 2-PP-4 mechanical and electrical trips reset and pump ready for AUTO start.

- Annun. 213 Drop 50 — NOT LIT. _____
- Annun. 214 Drop 10 — NOT LIT. _____

4.19 Locally verify the TDAFP trip and throttle valve (T&TV) is latched.

_____ Time _____ Date_____
Signature

4.20 Independently verify the trip and throttle valve latched.

_____ Time _____ Date_____
Independently Verified By

4.21 Section 4.0 verified complete by:

_____ Time _____ Date_____
Signature

{**NOTE**: Provide CUE that second verification is complete when asked.]

CT: Operator holds CS for 2-FMO-211 to OPEN and verifies OPEN

CT: Operator holds CS for 2-FMO-221 to OPEN and verifies OPEN

CT: Operator holds CS for 2-FMO-231 to OPEN and verifies OPEN

CT: Operator holds CS for 2-FMO-241 to OPEN and verifies OPEN

Operator verifies that Panel 213 Drop 50 & Panel 214 Drop 10 are NOT LIT

THIS JPM IS COMPLETE

.

Task Briefing

Your are the Extra RO

The US directs you to Perform 02-OHP-4030-STP-017TV, Turbine Driven AFW Pump Trip & Throttle Valve Operability Surveillance.

The TDAFP has been declared inoperable and LCO 3.7.5 has been entered for this Surveillance. An AEO has been briefed. The AEO has verified the TDAFP is ready for Start and is standing by.

There is No Identified Primary to Secondary leakage.

NRC2006-SIM07

TITLE	**Start a Reactor Coolant Pump (ALT)**	**REVISION**	**0**
PROGRAM	**Initial Licensed Operator (ILT)**	**TIME**	**15 Minutes**

SCOPE OF REVISION:
Modified RO-O-A030 by changing fault from RCP Seal Injection to CCW restoration.

			DATE:
AUTHOR	**Name:**	Max Bailey	
	Signature:		
FACILITY REVIEWER	**Name:**		
	Signature:		
		Facility Supervisor / Manager	

REFERENCES

02-OHP-4023-SUP-007, Rev 1a Restoration of RCP Cooling
02-OHP-4023-SUP-010, Rev 3 Starting Reactor Coolant Pumps

TASK: 0020030501 Restore RCP Support Systems following Containment Isolation
0020040501 Start an RCP

KA REFERENCE: SYS 003 A4.08 (3.2/2.9)

EVALUATION SETTINGS[1]

1. Simulator

HANDOUTS

1. Task Briefing
2. Copy of 02-OHP-4023-SUP-010
3. Copy of 02-OHP-4023-SUP-007

ATTACHMENTS

1. NONE

SIMULATOR SETUP[2]

1. Initialize simulator to any at power IC 982. [IC-28]
2. Insert malfunctions to remove reserve power (ED03A and ED03B)
3. Manually trip the reactor
4. Close valves 2-CCM-458 and 2-CCM-451
5. Perform actions in accordance with E-0 and ES-0.1
6. Restore Reserve Power to RCP Buses 2C & D (use SUP-002) after deleting ED malfunctions. Reset TR201AB and TR201CD 86 Relays
7. Restore Normal [N] lighting transformer to restore chart power. [MRF EDR34 to TRIP then RESET]
8. Ensure all SG NR levels above 27%.
9. FREEZE the simulator.

---

[1] Evaluation settings are listed in the preferred order.
[2] Simulator setup can be stored in a temporary IC to expedite the evaluation process.

TASK OBJECTIVES/STANDARDS

Start RCP #23 as directed per 02-OHP-4023-SUP-010 after restoring CCW Cooling per 02-OHP-4023-SUP-007 while observing all applicable precautions and limitations and procedure steps.

EVALUATOR INSTRUCTIONS

You are the Extra RO

An external Fault caused a reactor trip. Reserve power was lost after the trip, but has since been restored.

The crew has performed E-0, Reactor Trip or Safety Injection, and entered ES-0.1. Power has been restored to RCP Buses 2C & 2D

The US directs you to start RCP #23 using 02-OHP-4023-SUP-010, Starting Reactor Coolant Pump(s).

Number:	Title:	Revision Number:
02-OHP-4023 SUP-010	STARTING REACTOR COOLANT PUMP(S)	3

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	CAUTION Starting an RCP that had previously lost seal cooling could result in further seal and bearing damage.	
1.	**Check Electrical Bus For RCP To Be Started - ENERGIZED** • Bus 2A (RCP 24) • Bus 2B (RCP 21) • Bus 2C (RCP 22) • Bus 2D (RCP 23)	Return to procedure and step in effect.
2.	**Check RCP Cooling - NORMAL**	
	a. CCW flow: • Lower bearing - AT LEAST 5 GPM • Thermal barrier - AT LEAST 35 GPM • Upper bearing - AT LEAST 97.5 GPM	a. Establish normal cooling to RCPs using SUP-007, Restoration of RCP Cooling. **IF** normal RCP cooling can **NOT** be restored, **THEN** return to procedure and step in effect.

(Step 2 Continued On Next Page)

Page 2 of 8

CUE: RCP bus 2D energized

CT: Determines that RCP CCW Flow is NOT NORMAL & Enters RNO action go to SUP-007.

NOTE : Supply Operator with copy of 02-OHP-4023-SUP-007.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-007	RESTORATION OF RCP COOLING	1a

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED

NOTE

If RCP seal parameters have been exceeded, seal injection and CCW thermal barrier cooling should **NOT** be established to the RCPs.

1. **Check RCP Seal Temperatures - NORMAL**

   - "RCP Seal 1 Outlet Temp High" annunciators - HAVE REMAINED CLEAR
     - Panel 207, Drop 14 (RCP 1)
     - Panel 207, Drop 34 (RCP 2)
     - Panel 207, Drop 74 (RCP 3)
     - Panel 207, Drop 94 (RCP 4)
   - Lower bearing water temperatures - HAVE REMAINED LESS THAN 225°F

RCP	Indicator	Point
RCP 1	2-QTI-210	TO417A
RCP 2	2-QTI-220	TO437A
RCP 3	2-QTI-230	TO457A
RCP 4	2-QTI-240	TO477A

Perform the following:

a. Manually close CCW from RCP thermal barrier valves:
   - 2-CCM-453
   - 2-CCM-454

   IF at least one valve can **NOT** be manually closed, **THEN** locally close one valve.

b. Return to procedure and step in effect.

Page 2 of 4

CUE: All RCP alarms currently standing are the only ones that have been in alarm.

Operator verifies Panel 207 Drop 74 NOT LIT

Operator verifies 2-QTI-230 is less than 225ºF

Number: 02-OHP-4023 SUP-007	Title: RESTORATION OF RCP COOLING	Revision Number: 1a

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
2.	**Establish CCW Flow To RCPs:**	
	a. Check "RCP Therm Barr Clg Wtr Temp High" annunciators - HAVE REMAINED CLEAR • Panel 207, Drop 8 (RCP 1) • Panel 207, Drop 28 (RCP 2) • Panel 207, Drop 68 (RCP 3) • Panel 207, Drop 88 (RCP 4)	a. Return to procedure and step in effect.
	b. Open both CCW to RCP cooler valves: • 2-CCM-458 • 2-CCM-459	
	c. Open both CCW from RCP thermal barriers valves: • 2-CCM-453 • 2-CCM-454	
	d. Open both CCW from RCP oil cooler valves: • 2-CCM-451 • 2-CCM-452	

Page 3 of 4

Operator verifies Panel 207 Drop 68 NOT LIT

CT: Operator places 2-CCM-458 CS to OPEN

Operator verifies 2-CCM-458 & 2-CCM-459 are OPEN with red light lit

Operator verifies 2-CCM-453 & 2-CCM-454 are OPEN with red light lit

CT: Operator places 2-CCM-451 CS to OPEN

Operator verifies 2-CCM-451 & 2-CCM-452 are OPEN (red light lit)

Number:	Title:	Revision Number:
02-OHP-4023 SUP-007	RESTORATION OF RCP COOLING	1a

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
3.	**Check Charging System:** • CCPs - AT LEAST ONE RUNNING -OR- • CVCS crosstie - ESTABLISHED	Return to procedure and step in effect.
4.	**Establish Normal Seal Injection Flow To RCPs:** a. Adjust 2-QRV-200, charging header pressure control valve as necessary to maintain: • RCP seal injection flow - 6 TO 12 GPM	
5.	**Return To Procedure And Step In Effect**	

-END-

Page 4 of 4

Checks East CCP pump running

{**NOTE**: This is only a Critical Task if needed. Check in SUPP 10 prior to adjusting.}
CT: Adjusts 2-QRV-200 to adjust RCP Seal Injection to 6-12 gpm

Returns to 02-OHP-4023-SUP-010 Step 2.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-010	STARTING REACTOR COOLANT PUMP(S)	3

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	CAUTION Starting an RCP that had previously lost seal cooling could result in further seal and bearing damage.	
1.	**Check Electrical Bus For RCP To Be Started - ENERGIZED** • Bus 2A (RCP 24) • Bus 2B (RCP 21) • Bus 2C (RCP 22) • Bus 2D (RCP 23)	Return to procedure and step in effect.
2.	**Check RCP Cooling - NORMAL** a. CCW flow: • Lower bearing - AT LEAST 5 GPM • Thermal barrier - AT LEAST 35 GPM • Upper bearing - AT LEAST 97.5 GPM	a. Establish normal cooling to RCPs using SUP-007, Restoration of RCP Cooling. **IF** normal RCP cooling can **NOT** be restored, **THEN** return to procedure and step in effect.

(Step 2 Continued On Next Page)

Verifies RCP #23 CCW flows are Acceptable.

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STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
	(Step 2 Continued From Previous Page)	
	b. Seal injection flow - 6 TO 12 GPM	b. **IF** seal injection flow is **NOT** isolated, **THEN** adjust 2-QRV-200, charging header pressure control valve, as necessary to maintain 6 to 12 gpm. **IF** seal injection flow is isolated **OR** can **NOT** be adjusted to between 6 to 12 gpm, **THEN** return to procedure and step in effect.
3.	**Check The Following Annunciators For RCP To Be Started - CLEAR** • "RCP 1 Therm Barr Clg Wtr DP High" (Panel 207, Drop 7) • "RCP 2 Therm Barr Clg Wtr DP High" (Panel 207, Drop 27) • "RCP 3 Therm Barr Clg Wtr DP High" (Panel 207, Drop 67) • "RCP 4 Therm Barr Clg Wtr DP High" (Panel 207, Drop 87)	Return to procedure and step in effect.
4.	**Check RCP No. 1 Seal ΔP - GREATER THAN 200 PSID**	Return to procedure and step in effect.

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{**NOTE**: This is only a Critical Task if required.}
CT: Operator restores RCP Seal Injection to 6-12 gpm

Operator verifies Panel 207 Drop 67 is NOT LIT for RCP #23.

Operator verifies No. 1 Seal DP for RCP #23 is greater than 200.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-010	STARTING REACTOR COOLANT PUMP(S)	3

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
5.	**Check RCP Seal Leakoff Flow For RCP To Be Started - GREATER THAN VALUE FROM TABLE**	Perform **ONE** of the following: • Return to Step 1 (Page 2) and select another pump to start. -OR- • Return to procedure and step in effect.

RCP No. 1 Seal	
Differential Pressure (psid)	Leakoff Flow (gpm)
2250	1.00
2000	0.90
1800	0.82
1600	0.75
1400	0.67
1200	0.59
1000	0.51
800	0.43
600	0.36
400	0.28
200	0.20

6.	**Check RVLIS Upper Plenum Indication - AT LEAST 92%**	Perform the following: a. Raise PRZ level to 87% [90% ADVERSE]. b. Establish RCS subcooling based on core exit TCs greater than 62°F. c. Use PRZ heaters as necessary to saturate the PRZ water. **IF** PRZ level and RCS subcooling conditions can **NOT** be established, **THEN** return to procedure and step in effect.

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Operator verifies RCP #23 seal leakoff flow above minimum value.

Operator verifies RVLIS Upper Plenum greater than 92%.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-010	STARTING REACTOR COOLANT PUMP(S)	3

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
7.	**Start Bearing Lift Pump For RCP To Be Started And Allow To Run For Two Minutes**	

CAUTION

If offsite power is lost after SI reset, ECCS pumps will **NOT** automatically restart.

8. **Reset SI If Necessary**

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CT: Operator places the #23 RCP Bearing Lift Pump CS to RUN

(Evaluator may time compress once 2 minute run time is mentioned).

Operator verifies SI NOT actuated.

Procedure	Title	Revision Number
02-OHP-4023 SUP-010	STARTING REACTOR COOLANT PUMP(S)	3

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
9.	**Check SG Levels:**	
	a. Narrow range level in **ALL** SGs - GREATER THAN 27% [28% ADVERSE].	a. ~~Feed **ALL**~~ intact SG(s) as necessary to restore narrow range level greater than 27% [28% ADVERSE]. **IF** any SG level can **NOT** be restored greater than 27% [28% ADVERSE] **OR** any SG is **NOT** intact **AND** the selected RCP train's AC emergency buses are energized from the RCP buses, **THEN** defeat the degraded bus voltage relays by opening the associated knife switches: • RCP 21 or RCP 24: • DG2AB Test Switch 3, Knife 6 (Defeats trip of 2-T21A9 from Bus 2-2A during Bus 2-T21A degraded bus voltage trip with 2-2A5 closed) • DG2AB Test Switch 1, Knife 10 (Defeats trip of 2-T21B1 from Bus 2-2B during Bus 2-T21A degraded bus voltage trip with 2-2B5 closed) **-OR-** • RCP 22 or RCP 23: • DG2CD Test Switch 2, Knife 9 (Defeats trip of 2-T21C1 from Bus 2-2C during Bus 2-T21D degraded bus voltage trip with 2-2C4 closed) • DG2CD Test Switch 4, Knife 6 (Defeats trip of 2-T21D12 from Bus 2-2D during Bus 2-T21D degraded bus voltage trip with 2-2D3 closed)

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Operator verifies All SG levels above 27%.

Number:	Title:	Revision Number:
02-OHP-4023 SUP-010	STARTING REACTOR COOLANT PUMP(S)	3

STEP	ACTION/EXPECTED RESPONSE	RESPONSE NOT OBTAINED
10.	**Verify Normal PRZ Spray Valves - CLOSED** • 2-NRV-163 • 2-NRV-164	
11.	**Start Selected RCP**	
12.	**Check AC Emergency Buses Degraded Voltage Annunciators - CLEAR** • Panel 221: • "Train A Aux Buses Undervoltage" (Drop 67) • "Train B Aux Buses Undervoltage" (Drop 68)	**IF** either annunciator does **NOT** clear within two minutes of starting the RCP, **THEN** verify the associated train's RCP buses supply breakers to the AC emergency buses are open: • Train A: • T21C1, Bus 2C supply to Bus T21C • T21D12, Bus 2D supply to Bus T21D -OR- • Train B: • T21A9, Bus 2A supply to Bus T21A • T21B1, Bus 2B supply to Bus T21B
13.	**After 50 Seconds Stop Bearing Lift Pump**	

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Operator verifies both PZR Spray valves are CLOSED

CT: Operator places the RCP #23 CS to RUN.

Operator verifies UV alarms Panel 221 Drop 67 & 68 are NOT LIT.

Operator places the #23 RCP Bearing Lift Pump CS to STOP

Operator reports the No 23 RCP is running.

THIS JPM is COMPLETE

Task Briefing

You are the Extra RO

An external Fault caused a reactor trip. Reserve power was lost after the trip, but has since been restored.

The crew has performed E-0, Reactor Trip or Safety Injection, and entered ES-0.1. Power has been restored to RCP Buses 2C & 2D

The US directs you to start RCP #23 using 02-OHP-4023-SUP-010, Starting Reactor Coolant Pump(s).