Operations Training Program
Job Performance Measure

STATION: SALEM

SYSTEM: Generic Administrative – Conduct of Operations

TASK: Start the SBO Air Compressor IAW SC.OP-SO.CA-0001

TASK NUMBER: N1150140501

JPM NUMBER: 19-01 NRC IP-j

ALTERNATE PATH: [ ]

K/A NUMBER: G2.1.23

IMPORTANCE FACTOR: 4.3 (RO) 4.4 (SRO)

APPLICABILITY:
EO [ ] **RO** [X] **STA** [ ] **SRO** [X]

EVALUATION SETTING/METHOD: In Plant / Simulate

REFERENCES: SC.OP-SO.CA-0001, Rev. 14 (checked 1-15-20)
DWG 604495, Rev. 2 and 205347 Sht. 2 Rev. 43 (H-6)

TOOLS AND EQUIPMENT: SBO Compressor Building is normally unlocked (L-3 key if locked)

VALIDATED JPM COMPLETION TIME: 20 min

TIME PERIOD IDENTIFIED FOR TIME CRITICAL STEPS: N/A

Developed By:	**R. Chan** **Instructor**	**Date: 1-15-20**
Validated By:	**Moore / Weidner** **SME or Instructor**	**Date: 1-16-20**
Approved By:	**N/A** **Training Department**	**Date:**
Approved By:	**N/A** **Operations Department**	**Date:**

ACTUAL JPM COMPLETION TIME:

ACTUAL TIME CRITICAL COMPLETION TIME:

PERFORMED BY:

GRADE: [ ] **SAT** [ ] **UNSAT**

REASON, IF UNSATISFACTORY:

EVALUATOR'S SIGNATURE: **DATE:**

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REVISION HISTORY

JPM NUMBER: 19-01 NRC IP-j

Rev #	Date	Description	Validation Required
00	6-16-17	Added revision history and simulator setup pages. Editorial comments from IP 71111.11 FASA.	No
01	9-18-19	G2.1.23: Ability to perform specific system and integrated plant procedures during all modes of operation.	Yes

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SIMULATOR SETUP INSTRUCTIONS

SYSTEM: Generic Administrative – Conduct of Operations

TASK: Start the SBO Air Compressor IAW SC.OP-SO.CA-0001

TASK NUMBER: N1150140501

SIMULATOR IC: N/A

MALFUNCTIONS / REMOTES: N/A

OVERRIDES: N/A

SPECIAL INSTRUCTIONS:

- **This JPM is NOT located inside the RCA.**
- **Need L-3 key to unlock SBO Compressor Building**

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TASK: Start the SBO Air Compressor IAW SC.OP-SO.CA-0001

TASK NUMBER: N1150140501

INITIAL CONDITIONS:

- Both Salem Units have tripped due to a loss of off-site power.
- Equipment problems have resulted in NO Emergency Control Air Compressors (ECACs) running.

INITIATING CUE:

- The Unit 2 CRS has directed you to start the Station Blackout Compressor (SBO) IAW SC.OP-SO.CA-0001, SBO Diesel Control Air Compressor, starting with Step 5.1.3 (**see attached**).
- Steps 5.1.1 and 5.1.2 are complete.

Successful Completion Criteria:

1. All critical steps completed.
2. All sequential steps completed in order.
3. All time-critical steps completed within allotted time.
4. JPM completed within validated time. Completion time may exceed the validated time if satisfactory progress is being made (and NRC concurrence is obtained).

Task Standard for Successful Completion:
1. Operator performs Steps 5.1.3 thru 5.1.16 of SC.OP-SO.CA-0001 correctly and in proper sequence to start the SBO Diesel Control Air Compressor.

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* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
		Provide marked up copy of the SC.OP-SO.CA-0001, SBO Diesel Control Air Compressor with Prerequisites signed off. Additionally, Step 5.1.1 for removing Inspection Covers will be previously completed, as will Step 5.1.2 to re-install inspection covers.	Operator reviews and signs Precautions and Limitations. Operator must address obtaining hearing protection per P&L 3.1 All other P&Ls require no action other than reading and initialing with the exception of P&L 3.10 is verified at the SBO.		
	CUE:	Fill in the JPM Start Time when the student acknowledges the Initiating Cue. **START TIME**:_____			
	5.1.3	**OPEN** both Engine intake louvers (located outside building on west wall.)	**CUE:** After locating and describing how to open Engine intake louvers, state that ***the Engine intake louvers are open***.		

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* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.4	**OPEN** 1CA1920, BLACKOUT AIR COMPRESSOR DRAIN VALVE, to drain any water accumulation, then CLOSE 1CA1920.	Operator simulates opening 1CA1920 by turning counterclockwise direction. **CUE:** After locating 1CA1920, BLACKOUT AIR COMPRESSOR DRAIN VALVE, and describing how to open, including that the drain cap must be removed, state: ***1CA1920, BLACKOUT AIR COMPRESSOR DRAIN VALVE, has been cycled and no water came out of pipe***. Since the cue would be the same whether or not the drain cap was removed (nothing came out the end of pipe) only comment here for review if pipe cap was not removed.		
	5.1.5	**OPEN** 2FZSBO10, BATTERY CHARGER, breaker.	Locates 2FZSBO10, BATTERY CHARGER, breaker in Panel 2FZSBO, SBO Compressor Bldg Distribution Panel, and simulates opening. **CUE:** ***breaker is open***.		

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TASK: **Start the SBO Air Compressor IAW SC.OP-SO.CA-0001** **DATE:**

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.6	**PLACE** SBO Control Air Dryer switch in ON position.	Locates SBO Control Air Dryer switch and simulates turning switch to ON position. **CUE: *SBO Control Air Dryer switch is ON and Control Air On light is illuminated.***		
	5.1.7	**RECORD** Engine Hourmeter reading on Attachment 1, Section 1.0, and in log book at SBO compressor.	Locates Engine Hourmeter, 1XA16993, Tachometer/Hourmeter, inside engine control panel labeled Compressor Noise Emission Control Information, and records current reading in Section 1.0 of Att. 1. Locates logbook hanging from side of panel 2FZSBO, SBO Compressor Bldg Distribution Panel, and identifies where Engine Hourmeter should be logged.		

* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	5.1.8	**PLACE** UNLOADER VALVE selector switch in START position.	Locates UNLOADER VALVE selector switch, and ensures switch in START position. **Examiner's Note*:*** UNLOADER VALVE selector switch is <u>normally</u> in START position when engine is shutdown**.**		
		<u>NOTE</u> If engine fails to start after thirty seconds of cranking, allow starter to cool 5 minutes before attempting restart.	Operator reads note and continues on with procedure.		
*	5.1.9	**PRESS** <u>AND</u> **HOLD** BY-PASS VALVE pushbutton.	**Locates BY-PASS VALVE pushbutton in control panel, and simulates depressing <u>AND</u> holding depressed.**		

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* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.10	**PLACE** SBO-IGN-SWT, ENGINE IGNITION SWITCH in START position until engine starts, then **RELEASE** to RUN position.	**While keeping the BY-PASS VALVE pushbutton depressed, operator simulates placing the SBO-IGN-SWT, ENGINE IGNITION switch in the START position.** **CUE**: ***Engine has started***. **After CUE is given, operator releases SBO-IGN-SWT switch to RUN.** **Examiner's Note*:*** IF operator releases the BY-PASS VALVE pushbutton at this point without checking oil pressure >15 psig, THEN: **CUE:** ***engine has stopped***. **Examiner's Note**: see step 5.1.11 for actions to re-perform engine start.		

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* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.11	When engine oil pressure is >15 psig, **RELEASE** BY-PASS VALVE pushbutton.	**Identifies oil pressure reading on gauge labeled "oil pressure" gauge inside control panel.** **CUE: *Oil pressure is 40 psig*.** **Operator releases BY-PASS VALVE pushbutton**. **Examiner's Note**: IF operator releases this pushbutton **before** verifying oil pressure and was cued that the engine stopped, then the operator will need to re-perform steps 5.1.9 thru 5..1.11. IF operator reads NOTE and waits 5 minutes to cool engine, THEN use: **CUE**: ***5 minutes has elapsed***.		
	5.1.12	**ALLOW** engine to run for 5 minutes to warm up.	**CUE: *5 minutes has elapsed*.**		

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* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.13	**OPEN** 1CA1913 SBO COMPRESSOR DISCHARGE VALVE, to pressurize Control Air header.	**Locates and simulates opening in the counter-clockwise direction 1CA1913 SBO COMPRESSOR DISCHARGE VALVE.** **CUE: *valve is open***.		
*	5.1.14	**OPEN** 1CA1886, BLACKOUT AIR COMPRESSOR ISOLATION.	**Locates and simulates opening in the counter-clockwise direction 1CA1886, BLACKOUT AIR COMPRESSOR ISOLATION.** **CUE: *valve is open***. **Examiner's Note**: 1CA1886 is located near the entrance to Service Building on right side past the U2 mixing bottle		

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* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
*	5.1.15	**OPEN** 2CA584, YARD CONTROL AIR SUPPLY VALVE, to pressurize Aux. Building 1A and 2A Control Air headers.	**Locates and simulates opening in the counter-clockwise direction 2CA584, YARD CONTROL AIR SUPPLY VALVE.** **CUE: *valve is open*** **Examiner's Note**: 2CA584 is located near the entrance to Service Building on right side past the U2 mixing bottle.		
*	5.1.16	**PLACE** UNLOADER VALVE selector switch in RUN position.	**Operator returns to the SBO Compressor Building and points out UNLOADER VALVE selector switch and simulates placing it in RUN position.** **CUE: *switch is in RUN*** **JPM is Complete**		

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* #	STEP NO.	STEP (Shaded area denotes Critical Step) (* Critical Step) (# Sequential Critical Step)	STANDARD (Bolded area identifies Task Standard)	EVAL S/U	COMMENTS (Required for UNSAT evaluation)
	CUE:	WHEN operator informs you the task is complete, OR the JPM has been terminated for other reasons, THEN **RECORD** the STOP TIME. **STOP TIME**:_____	**Terminate JPM when operator completes step 5.1.16.**		

JOB PERFORMANCE MEASURE VALIDATION CHECKLIST

JPM#: 19-01 NRC IP-j

NOTE: All steps of this checklist should be performed upon initial validation. Prior to JPM usage, revalidate JPM using steps 8 and 11 below.

RC 1. Task description and number, JPM description and number are identified.

RC 2. Knowledge and Abilities (K/A) references are included.

RC 3. Performance location specified. (in-plant, control room, or simulator)

RC 4. Initial setup conditions are identified.

RC 5. Initiating and terminating Cues are properly identified.

RC 6. Task standards identified and verified by SME review.

RC 7. Critical steps meet the criteria for critical steps and are identified with an asterisk (*).

RC 8. Verify the procedure referenced by this JPM matches the most current revision of that procedure: Procedure Rev. __14___ Date ____1-15-20_____

RC 9. Pilot test the JPM:
a. verify Cues both verbal and visual are free of conflict, and
b. ensure performance time is accurate.

N/A 10. If the JPM cannot be performed as written with proper responses, then revise the JPM.

N/A 11. When JPM is revalidated, SME or Instructor sign and date JPM cover page.

SME/Instructor:	R. Chan	Date:	1-15-20
SME/Instructor:	R. Moore	Date:	1-16-20
SME/Instructor:	Z. Weidner	Date:	1-16-20

INITIAL CONDITIONS:

- Both Salem Units have tripped due to a loss of off-site power.
- Equipment problems have resulted in NO Emergency Control Air Compressors (ECACs) running.

INITIATING CUE:

- The Unit 2 CRS has directed you to start the Station Blackout Compressor (SBO) IAW SC.OP-SO.CA-0001, SBO Diesel Control Air Compressor, starting with Step 5.1.3 (**see attached**).
- Steps 5.1.1 and 5.1.2 are complete.

5.0 **PROCEDURE**

5.1 **Compressor Startup**

___ 5.1.1 **REMOVE** the Compressor Inspection Covers (4) AND **ENSURE** the following:

___ A. All belts and hoses are intact AND tightness of the Fan Belt appears proper.

___ B. Radiator level is full (accessible through inspection hatch on top of Compressor Enclosure).

___ C. Compressor oil reservoir level is visible in upper site glass.

___ D. Engine oil level (dip stick), is satisfactory .

___ E. Fuel oil level is ≥3/4 with "SBO-IGN-SWT" in RUN (on Instrument Panel).

___ F. Air After Cooler Fan Motor Oiler level is visible in sightglass.

NOTE

Normally all doors and inspection covers, except instrument panel door, should be closed during compressor operation. However covers may be removed, as required, to ensure the compressor has adequate cooling. **[80084186]**

Compressor Inspection Covers should remain removed during the summer operating period.

___ 5.1.2 IF additional cooling is NOT required,
AND this is NOT the summer operating period,
THEN **RE-INSTALL** Compressor Inspection Covers.

___ 5.1.3 **OPEN** both Engine intake louvers (located outside building on west wall).

___ 5.1.4 **OPEN** 1CA1920, BLACKOUT AIR COMPRESSOR DRAIN VALVE, to drain any water accumulation, then CLOSE 1CA1920.

___ 5.1.5 **OPEN** 2FZSBO10, BATTERY CHARGER, breaker.

___ 5.1.6 **PLACE** SBO Control Air Dryer switch in ON position.

___ 5.1.7 **RECORD** Engine Hourmeter reading on Attachment 1, Section 1.0 and in log book at SBO Air Compressor.

___ 5.1.8 **PLACE** UNLOADER VALVE selector switch in START position.

NOTE

If engine fails to start after thirty seconds of cranking, allow starter to cool 5 minutes before attempting restart.

___ 5.1.9 **PRESS** AND **HOLD** BY-PASS VALVE pushbutton.

___ 5.1.10 **PLACE** SBO-IGN-SWT, ENGINE IGNITION SWITCH in START position until engine starts, then **RELEASE** to RUN position.

___ 5.1.11 When engine oil pressure is >15 psig, **RELEASE** BY-PASS VALVE pushbutton.

___ 5.1.12 **ALLOW** engine to run for 5 minutes to warm up.

___ 5.1.13 **OPEN** 1CA1913, SBO COMPRESSOR DISCH VALVE, to pressurize Control Air header.

___ 5.1.14 **OPEN** 1CA1886, BLACKOUT AIR COMPRESSOR ISOLATION.

___ 5.1.15 **OPEN** 2CA584, YARD CONTROL AIR SUPPLY VALVE, to pressurize Aux. Building 1A and 2A Control Air headers.

___ 5.1.16 **PLACE** UNLOADER VALVE selector switch in RUN position.

___ 5.1.17 **RECORD** required readings on Attachment 1, Section 2.0, and at least once every 2 hours thereafter during operation.

ATTACHMENT 1
(Page 1 of 2)

SBO DIESEL CONTROL AIR COMPRESSOR DATA

1.0 **RUN TIME**:

Engine Hour meter (1) (start)	Engine Hour meter (1) (stop)	Run Time

2.0 **OPERATING PARAMETERS**:

Parameter	Criteria	Data							
Discharge Press (1)	>135 psig								
Air Temp (1)	≤255°F								
Water Temp (1)	<215°F								
Oil Press (1)	≥25 psig								
Fuel Oil Level (1)	≥3/4								
Engine Speed (1)	1200-1950 RPM								
Aftercooler Outlet Temp	≤145°F - TL16948								
Pre-filter ΔP	GREEN (1PL16949)								
After-filter ΔP	GREEN (1PL16955)								
Cont Air Hdr Press	>100 psig - (1PL16774)								
Aftercooler Fan (2)	Running	Sat Unsat							
Air Dryer (2)	Cycling	Sat Unsat							
Ambient Temp (Cont Rm SPDS) (2)		°F							

(1) Skid Mounted Instrumentation Panel

(2) Record one time during operation