

**PSEG NUCLEAR L.L.C.
SALEM/OPERATIONS**

S1.OP-SO.125-0005(Q) REV. 22

1A 125VDC BUS OPERATION

USE CATEGORY: I

-
- ◆ Biennial Review Performed: Yes ____ No ____ NA ✓
 - ◆ DCP Packages and Affected Document Numbers incorporated into this revision: None
 - ◆ The following OTSCs were incorporated into this revision: None
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REVISION SUMMARY:

- ◆ Added Step 2.5.3, to address Control Room Ventilation System (CAV Dampers) [70068226]
OPERABILITY concerns when the 1A 125VDC Battery is disconnected from 1A 125VDC Bus.
Editorial change as previously reviewed and approved in S1.OP-SO.115-0011(Q).
- ◆ Added Steps 5.1.8.B & E, and Steps 5.4.7.B & E, incorporates lessons learned [70067892]
in Unit 1 Refueling Outage, (1R18). Adds substeps to place the #1 & #2 ECACS in MANUAL
when transferring 1H 4KV Bus 125VDC Control Power. #1 & #2 ECACS will AUTO start
if #1 Station Air Compressor is in service.

IMPLEMENTATION REQUIREMENTS

Effective Date: October 23, 2007

None

1A 125VDC BUS OPERATION

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1.0 **PURPOSE**

1.1 To provide instructions necessary to:

- ◆ Transfer 1A 125VDC Bus Loads to 1B 125VDC Bus
- ◆ Disconnect 1A 125VDC Battery from 1A 125VDC Bus
- ◆ Connect 1A 125VDC Battery to 1A 125VDC Bus
- ◆ Return 1A 125VDC Bus Loads to 1A 125VDC Bus

2.0 **PREREQUISITES**

- ___ 2.1 **IDENTIFY** Sections of this procedure that are NOT to be performed with "N/A".
- ___ 2.2 **REVIEW** Components "Off Normal and Off Normal Tagged" list(s) for the system and support system(s) associated with the evolution to be performed in this procedure.
- ___ 2.3 Unit 1 is in Mode 5, 6, or Defueled.
- ___ 2.4 IF removing 1A 125VDC Bus from service,
(removing both 1A1 AND 1A2 125VDC Battery Chargers from service)
THEN:
- ___ 2.4.1 **REVIEW** S1.OP-SO.125-0004(Q), 125VDC Ground Detection, for the effects of transferring power sources to the following 125VDC Distribution Cabinets:
- 1ADC3AX, 1ADC 125VDC
 - 1ADC2AX, 1AADC 125VDC
- ___ 2.4.2 **ESTABLISH** conditions specified in Attachment 1 as necessary to support required equipment prior to transferring 1A 125VDC Bus loads to 1B 125VDC Bus to prevent exceeding the one-minute design basis loading on 1B 125VDC Bus.
- ___ 2.4.3 **NOTIFY** the Electric System Operator that position indications for 500KV BS 1-5 and 5-6 breakers will become momentarily inoperable during 1ADC3AX, 1ADC 125V Distribution Cabinet, power supply transfers.

(step continued on next page)

2.4 (continued)

- ____ 2.4.4 **PERFORM** Step 2.4.4A OR Step 2.4.4B IAW S1.OP-SO.115-0011(Q),
1A Vital Instrument Bus UPS System Operation:
 - ____ A. IF 1A 115V Vital Instrument Bus is to be removed from service,
THEN DE-ENERGIZE 1A 115V Vital Instrument Bus,
AND REMOVE 1A Vital Instrument Bus UPS System from service.
 - ____ B. IF 1A 115V Vital Instrument Bus is to remain in service,
THEN PERFORM Step 2.4.4B.1 OR Step 2.4.4B.2:
 - ____ 1. IF 1A 115V Vital Instrument Bus is to be energized
from the AC Line Regulator,
THEN:
 - ____ a. **TRANSFER** 1A 115V Vital Instrument Bus from Inverter
to AC Line Regulator.
 - ____ b. **DE-ENERGIZE** 1A Vital Instrument Bus Rectifier and Inverter
with AC Line Regulator supplying the 1A Vital Instrument Bus.
 - ____ 2. IF 1A 115V Vital Instrument Bus is to be energized from the Inverter
with DC Power Supply de-energized,
THEN DE-ENERGIZE DC Power Supply from the Inverter
with Inverter Supplying 1A Vital Instrument Bus.

- ___ 2.5 IF removing 1A 125VDC Bus from service,
(removing both 1A1 and 1A2 125VDC Battery Chargers from service)
OR disconnecting 1A 125VDC Battery from 1A 125VDC Bus,
(maintaining 1A1 or 1A2 125VDC Battery Charger in service)
THEN:
- ___ 2.5.1 **REVIEW** Technical Specifications for applicability:
- ___ ◆ 3.8.2.4, 125 Volt DC Distribution - Shutdown
- ___ ◆ 3.8.2.2, A.C. Distribution - Shutdown
- ___ ◆ 3.7.6.1 Unit 1, (3.7.6 Unit 2) Control Room
Emergency Air Conditioning System.
- ___ ◆ Action Statement Tracking Log with respect to current expiration dates
and 1A 125VDC Bus outage duration.
- ___ 2.5.2 **INITIATE** S2.OP-SO.CAV-0001(Q), Control Area Ventilation Operation
for Operation With Unit 1 EACS Out-Of-Service (Maintenance Mode)
(Refer to Step 3.8).
- ___ 2.5.3 **PERFORM** the following (70068226):
- ___ ◆ **ENTER** T/S 3.7.6.1, ACTION f (Unit 1 Modes 5-6)
AND T/S 3.7.6 ACTION e/f (Unit 2, Modes 1-4/Modes 5-6).
- ___ ◆ **SECURE** 1CAA48 OR 1CAA49 CLOSED
IAW S1.OP-SO.CAV-0001(Q), Control Area Ventilation Operation.
- ___ 2.5.4 **ENSURE** 1B 125VDC Bus is in service.
- ___ 2.5.5 **ENSURE** 2B 125VDC Bus is in service to provide
control power to 1CW 460V Bus.
- ___ 2.5.6 **ENSURE** all redundant equipment required to be OPERABLE,
as a result of transferring 1A 125VDC loads to 1B 125VDC Bus
OR disconnecting 1A 125VDC Bus from 1A 125VDC Battery, are OPERABLE.
1A 4KV Vital Bus AND 1A 460/230V Vital Buses are inoperable
when 1A 125VDC Bus is disconnected from the 1A 125VDC Battery
(Safety Evaluation S99-055).
- ___ 2.5.7 **ENSURE** 12 FHB Exhaust Fan aligned to 1BX1AX5X & 1BX1AX5X*
is aligned to their normal power source (Refer to Step 3.4).

___ 2.5.8 **ENSURE** all Temporary Modifications connecting 1B and 1C 125VDC Buses and equipment are removed to maintain electrical train separation and bus operability requirements (Refer to Step 3.4)

___ 2.5.9 **PERFORM** the following actions for 12 Emergency Lighting UPS System:

- ___ A. **ENSURE** 1BZ1AX, 12 Emergency Lighting Distribution Cabinet is powered from the preferred AC source.
- ___ B. **DE-ENERGIZE** 12 Emergency Lighting Inverter with preferred AC source supplying 12 Emergency Lighting Distribution Cabinet IAW S1.OP-SO.115-0006(Q), 12 Emergency Lighting UPS System Operation.
- ___ C. **C/T 1BDC1AX24, 12 EMERGENCY LIGHTING INVERTER** (support transferring 1A 125VDC Bus loads to 1B 125VDC Bus).

___ 2.5.10 **IF** 1A 230V Vital Bus is to remain energized,
THEN:

- ___ A. **ALIGN** 1A 4KV Vital Bus power supply as required to support any SPT maintenance activities planned during the battery maintenance window IAW S1.OP-SO.4KV-0001(Q), 1A 4KV Vital Bus Operation. Refer to Step 3.10.
- ___ B. **PERFORM** the following IAW S1.OP-SO.115-0005(Q), 11 Emergency Lighting UPS System Operation:
 - ___ 1. **IF** 1AZ1AX, 11 Emergency Lighting Distribution Cabinet (1ELD-A), is energized from 11 Emergency Lighting Inverter,
THEN TRANSFER 11 Emergency Lighting Distribution Cabinet from 11 Emergency Lighting Inverter to Preferred AC Source.
 - ___ 2. **DE-ENERGIZE** 11 Emergency Lighting Inverter with Preferred AC Source supplying 11 Emergency Lighting Distribution Cabinet.

___ 2.5.11 **IF** 1A 460/230V Bus outage is planned concurrent with 1A 125VDC Battery outage,
THEN PLACE 1A2 125VDC Battery Charger in service
IAW S1.OP-SO.125-0001(Q), 1A 125VDC Battery Charger Operation.

___ 2.6 **IF** Section 5.3, Connecting 1A 125VDC Battery to 1A 125VDC Bus is to be performed,
THEN 1A1 **OR** 1A2 125VDC Battery Charger is available.

___ 2.7 **IF** Section 5.4, Returning 1A 125VDC Bus Loads to 1A 125VDC Bus is to be performed,
THEN No maintenance or testing is in progress on 1A 125VDC Bus.

3.0 PRECAUTIONS AND LIMITATIONS

- ___ 3.1 Transferring 1ADC2AX, 1AADC 125VDC Distribution Cabinet power supply will result in the following:
 - ___ 3.1.1 Containment Radiation Monitor sample valves 1VC8 and 1VC12 will close.
 - ___ 3.1.2 Letdown Heat Exchanger cooling control valve 1CC71 will close.
 - ___ 3.1.3 Pressurizer Power Operated Relief valve 1PR1 will close.
 - ___ 3.1.4 11SW122 will receive a sealed in CLOSE signal. 11SW122 will be required to be reset when 1AADC 125VDC Distribution Cabinet is re-energized. (43-1 switch, 11 CCHX room)
- ___ 3.2 Transferring 1ADC2AX, 1AADC Distribution Cabinet, power supply to 1B 125VDC Bus will result in the following:
 - ___ 3.2.1 POPS CH I and CH II solenoid valves will be powered from the same bus, rendering one channel inoperable. A subsequent failure of 1B 125VDC Bus will render both channels inoperable. Establishing a RCS vent path should be evaluated prior to transferring the power supply. (Refer to T/S 3.4.9.3.)
 - ___ 3.2.2 11SW122, 12SW376 and 12SW380 will be powered from the same bus. A subsequent failure of 1B 125VDC Bus will isolate service water from both Component Cooling Heat Exchangers. To preclude this situation:
 - ___ A. IF 12A and 12B CCHXs are to remain in-service, THEN 12SW376 and 12SW380 will be failed open, AND 12SW384 and 12SW385 will be throttled to maintain CCW temperature and to ensure 10,000 gpm is NOT exceeded.
 - ___ B. IF 11 CCHX is to remain in-service, THEN 11SW122 will be placed in mechanical MANUAL to maintain CCW temperature and to ensure 10,000 gpm is NOT exceeded.
 - ___ 3.2.3 An Operator Action Log will be initiated IAW SH.OP-AP.ZZ-0110(Q), Use and Development of Operating Logs, to maintain Service Water flow to the in-service CCHX <10,000 gpm, AND Component Cooling temperature within 3°F of the desired temperature as indicated on 1TI602B (1TI602A). The log will direct action to manually throttle the associated valve(s), as required to maintain parameters.

- ___ 3.3 An electrical AC bus Train is inoperable when its respective inverter is NOT in its normal alignment. In Modes 5 and 6, normal alignment means that the respective inverter is aligned to an operable diesel generator and connected to its respective DC bus Train (Technical Specification 3.8.2.2).
- ___ 3.4 When transferring distribution cabinet power supplies, each evolution should be carefully examined to ensure required electrical train separation and operability requirements are maintained since jumpers may be installed throughout the vital and non-vital AC and DC electrical distribution systems.
- ___ 3.5 The Emergency Diesel Generator (EDG) Turbo Boost will actuate when 125VDC control power is cycled on an operating service water pump with the associated EDG in operation (PR990419147).
- ___ 3.6 During transfer of 125VDC control power to 1CW 460V Bus, 1CW breakers will not trip on fault conditions, and cannot be remotely operated. Operators should be stationed at 1CW 460V Bus and 84' Swgr Rm to facilitate the quick transfer of 1CW Bus control power.
- ___ 3.7 During transfer of 125VDC control power to 13KV North Ring Bus, 13KV breakers will not trip on fault conditions, and cannot be remotely operated. Operators should be stationed at the 13KV North Ring Bus and 84' Swgr Rm to facilitate the quick transfer of 13KV North Ring Bus control power.
- ___ 3.8 The Control Area Ventilation System is to be placed in Operation With Unit 1 EACS Out-Of-Service (Maintenance Mode) when 1A 125VDC Battery is disconnected from its bus. 11 EACS Fan and CRIX relay (Train A) are inoperable during the 1A 125VDC maintenance window [80069101].
- ___ 3.9 An Operator should be stationed at the 104 Panel to maintain control of Rad Waste during 125VDC Distribution Cabinet power supply transfers.
- ___ 3.10 Transferring 1A 4KV Vital Bus power supply during the 1A 125VDC Battery maintenance window will result in a momentary deenergization of the associated 115VAC bus and will cause spurious component actuation.
- ___ 3.11 The following 500KV breaker regular protection circuits and trip coils are powered from 1A 125VDC Bus:
 - 500KV BS 1-5 - Regular Protection Circuit - Trip Coil 1
 - 500KV BS 5-6 - Regular Protection Circuit - Trip Coil 1

As a result, all work involving testing or maintenance on the following back-up protection circuits and trip coils, powered from 1B 125VDC Bus, should be suspended to prevent inadvertent loss of breaker trip capability during periods when 1A 125VDC Bus is powered solely from a battery charger:

- 500KV BS 1-5 - Back-up Protection Circuit - Trip Coil 2
- 500KV BS 5-6 - Back-up Protection Circuit - Trip Coil 2

___ 3.12 Any system or portion of a system which is NOT aligned to its normal 125VDC power supply cannot be considered OPERABLE unless an evaluation is performed that demonstrates the capability of the system to meet single failure criteria (SER Supplement 3, Section 8.3.2). The following components have been evaluated for operation in Modes 5, 6 or Defueled, and may be considered OPERABLE when the 1A 125VDC Battery Disconnect Switch (1ADC1AX39) is OPEN, OR the component is aligned to its backup 125VDC power supply:

___ ♦ Chilled Water System components [80086263]:

- ___ • 11 Chiller - The 115VAC control circuit is powered from 1AX1AX13X, 11 Chiller. The compressor will continue to run and perform its protective function on a loss of 1A 125VDC Bus.
- ___ • 11 Chilled Water Pump - The 115VAC control circuit is powered from 1AY3AX2H, 11 Chilled Water Pump. The pump will continue to run and perform its protective function on a loss of 1A 125VDC Bus.
- ___ • Chilled Water Isolation valve (1CH30) - The valve will fail closed and perform its protective function on a loss of 1A 125VDC Bus.

___ ♦ 11 FHB Exhaust Fan - The control circuit has been evaluated and it has been determined that 125VDC control power is NOT required for the system to perform its protective function. The fan will continue to run on a loss of 125VDC control power [Safety Evaluation S99-055].

___ ♦ 11 RHR Pump - Control power must be supplied by a 125VDC Battery Charger. This configuration places the plant in a more vulnerable position for a loss of RHR and should be assessed IAW SC.OM-AP.ZZ-0001(Q), Shutdown Safety Management Program [80065730].

4.0 EQUIPMENT/MATERIAL REQUIRED

None

5.0 **PROCEDURE**5.1 **Transferring 1A 125VDC Bus Loads to 1B 125VDC Bus**

- ___ 5.1.1 **CLOSE** the following breakers, for equipment to remain in service (1BDC1AX 125VDC Bus, 84' Swgr Room):
- ___ ◆ 1BDC1AX13, NO. 1E & 1H 4KV BUSES CONTROL POWER
1E (REG), 1H (EMER)
 - ___ ◆ 1BDC1AX30, 1A 4KV VITAL BUS EMERGENCY CONTROL POWER
- ___ 5.1.2 **IF** a 1A 125VDC Bus outage is planned (both 1A 125VDC Battery Chargers are to be removed from service), **THEN CLOSE** the following breakers, for equipment to remain in service:
- ___ ◆ 1BDC1AX19, 1AADC 125VDC DISTRIBUTION CABINET
EMERGENCY POWER
 - ___ ◆ 1BDC1AX25, 1ADC 125VDC DISTRIBUTION CABINET
EMERGENCY POWER
 - ___ ◆ 1BDC1AX29, NO. 1G & 1E 460V BUSES CONTROL POWER
1G (REG), 1E (EMER)
 - ___ ◆ 1BDC1AX35, 1A 460V VITAL BUS EMERGENCY CONTROL POWER
- ___ 5.1.3 **ENSURE** the following breakers are CLOSED for equipment to remain in service (1BDC1AX 125VDC Bus, 84' Swgr Room):
- ___ ◆ 1BDC1AX10, NO. 1H & 1F 460V BUSES CONTROL POWER
1H (REG), 1F (EMER)
 - ___ ◆ 1BDC1AX12, NO. 1G & 1F 4KV BUSES CONTROL POWER
1G (REG), 1F (EMER)
 - ___ ◆ 1BDC1AX20, 1BBDC 125VDC DISTRIBUTION CABINET
REGULAR POWER
 - ___ ◆ 1BDC1AX26, 1BDC 125VDC DISTRIBUTION CABINET
REGULAR POWER
 - ___ ◆ 1BDC1AX31, 1B 4KV VITAL BUS REGULAR CONTROL POWER
 - ___ ◆ 1BDC1AX36, 1B 460V VITAL BUS REGULAR CONTROL POWER

- ___ 5.1.4 **ENSURE** the following breakers are OPEN
(1ADC1AX 125VDC Bus, 84' Swgr Room):
 - ___ ◆ 1ADC1AX10, NO. 1F & 1H 460V BUSES CONTROL POWER
1F (REG), 1H (EMER)
 - ___ ◆ 1ADC1AX12, NO. 1F & 1G 4KV BUSES CONTROL POWER
1F (REG), 1G (EMER)
 - ___ ◆ 1ADC1AX20, 1BBDC 125VDC DISTRIBUTION CABINET
(EMERGENCY)
 - ___ ◆ 1ADC1AX26, 1BDC 125VDC DISTRIBUTION CABINET
(EMERGENCY)
 - ___ ◆ 1ADC1AX31, 1B 4KV VITAL BUS CONTROL POWER (EMERGENCY)
 - ___ ◆ 1ADC1AX36, 1B 460V VITAL BUS CONTROL POWER (EMERGENCY)

NOTE

Steps 5.1.5 through 5.1.17 may be performed in any order or concurrently at the SM/CRS discretion. Steps 5.1.11 through 5.1.17 are only performed when a 1A 125VDC Bus outage is planned.

- ___ 5.1.5 **TRANSFER** 1A 4KV Vital Bus 125VDC control power, as follows
(1A 4KV VITAL BUS 4KV PT's Cubicle rear):
 - ___ A. **NOTIFY** NCO that 1A 4KV Bus control power is to be transferred
from 1A 125VDC Bus to 1B 125VDC Bus.
 - ___ B. **OPEN** 1AD1AXX1, 1A 4KV VITAL BUS REG CONTROL POWER
FROM 1ADC30.
 - ___ C. **OPEN** 1AD1AXX3, 1A 4KV VITAL BUS REG ALARM POWER
FROM 1ADC30.
 - ___ D. **CLOSE** 1AD1AXX2, 1A 4KV VITAL BUS EMER CONTROL POWER
FROM 1BDC30.
 - ___ E. **CLOSE** 1AD1AXX4, 1A 4KV VITAL BUS EMER ALARM POWER
FROM 1BDC30.
 - ___ F. Notify NCO to **ENSURE** the following:
 - ___ ◆ Aux. Annunciator Point 0519, 1A 4KV VITAL BUS,
LOSS OF 125VDC, alarmed and cleared.
 - ___ ◆ Aux. Annunciator Point 0530, 1A 4KV VITAL BUS,
LOSS OF NORM 125VDC, is in alarm.
 - ___ ◆ Aux. Annunciator Point 0531, 1A 4KV VITAL BUS
CIRCUIT ENERGIZED, is in alarm.

___ 5.1.6 **TRANSFER** 1CW 460V Bus 125VDC control power, as follows:

CAUTION

During transfer of 125VDC control power to 1CW 460V Bus, 1CW breakers will not trip on fault conditions, and cannot be remotely operated. Operators should be stationed at 1CW 460V Bus and 84' Swgr Rm to facilitate the quick transfer of 1CW Bus control power.

- ___ A. **NOTIFY** NCO that 1CW 460V Bus control power is to be transferred from 1A 125VDC Bus to 2B 125VDC Bus.
- ___ B. **OPEN** 1ADC1AX15, 1CW 460V BUS CONTROL POWER (REGULAR), (1ADC1AX 125VDC Bus, 84' Swgr Room).
- ___ C. **CLOSE** 2BDC1AX15, 1CW 460V BUS EMERGENCY CONTROL POWER, (Unit 2, 2BDC1AX 125VDC Bus, 84' Swgr Room).
- ___ D. **OPEN** 1CW1CWX1, 1CW 460V BUS REGULAR CONTROL POWER FROM 1ADC15, (Unit #1 Circ. Water Intake Structure 480V Substation, 1CW-460-PTS-S cabinet).
- ___ E. **CLOSE** 1CW1CWX2, 1CW 460V BUS EMERGENCY CONTROL POWER FROM 2BDC15 (Unit #1 Circ. Water Intake Structure 480V Substation, 1CW-460-PTS-S cabinet).
- ___ F. **IF** LOSS OF DC, UNDERVOLTAGE OR TX HIGH PRESSURE indicating light is illuminated,
THEN:
 - ___ 1. **PRESS** INDICATING LIGHT RESET LOSS OF DC, UNDERVOLTAGE OR TX HIGH PRESSURE pushbutton.
 - ___ 2. **ENSURE** LOSS OF DC, UNDERVOLTAGE OR TX HIGH PRESSURE indicating light is extinguished.
- ___ G. Notify NCO to **ENSURE** Aux. Annunciator Point 0810, 1CWI 460V BUS/LOSS OF VOLTAGE, alarmed and cleared.

- ___ 5.1.7 **TRANSFER** 13KV North Ring Bus Group "A" and Group "B"
125VDC control power, as follows:

CAUTION

During transfer of 125VDC control power to 13KV North Ring Bus, 13KV breakers will not trip on fault conditions, and cannot be remotely operated. Operators should be stationed at 13KV North Ring Bus and 84' Swgr Rooms to facilitate the quick transfer of 13KV North Ring Bus control power.

- ___ A. **NOTIFY** NCO that 13KV North Ring Bus Group "A" and Group "B" Buses control power are to be transferred from 1A 125VDC Bus to 2B 125VDC Bus.
- ___ B. **OPEN** 1ADC1AX22, A7G (REG) & B7G (EMER)
125VDC DISTRIBUTION PANELS,
(1ADC1AX 125VDC Bus, 84' Swgr Room).
- ___ C. **CLOSE** 2BDC1AX22, B7G (REG) & A7G (EMER)
125VDC DISTRIBUTION PANELS,
(Unit 2, 2BDC1AX 125VDC Bus, 84' Swgr Room).
- ___ D. **PERFORM** the following at 13KV North Ring Bus
Distribution Panel 3J1YDADC:
 - ___ 1. **OPEN** 3J1YDADC-5, 13KV "A" 125VDC PANEL BOARD
REGULAR FEED FROM 1ADC22.
 - ___ 2. **CLOSE** 3J1YDADC-6, 13KV "A" 125VDC PANEL BOARD
EMERGENCY FEED FROM 2BDC22.
- ___ E. **PERFORM** the following at 13KV North Ring Bus
Distribution Panel 3J1YDBDC:
 - ___ 1. **OPEN** 3J1YDBDC-6, 13KV "B" 125VDC PANEL BOARD
EMERGENCY FEED FROM 1ADC22.
 - ___ 2. **CLOSE** 3J1YDBDC-5, 13KV "B" 125VDC PANEL BOARD
REGULAR FEED FROM 2BDC22.
- ___ F. Notify NCO to **ENSURE** the following:
 - ___ ♦ Aux. Annunciator Point 0194, 13KV GRP BUS A,
LOSS OF 125VDC, alarmed and cleared.
 - ___ ♦ Unit 2 Aux. Annunciator Point 0190, 13KV GRP BUS B,
LOSS OF 125VDC, alarmed and cleared.

- 5.1.8 **TRANSFER** 1H 4KV Group Bus 125VDC control power, as follows
(1H 4KV Group Bus PT Cubicle):
- A. **NOTIFY** NCO that 1H 4KV Bus control power is to be transferred from 1A 125VDC Bus to 1B 125VDC Bus.
 - B. IF #1 Station Air Compressor (SAC) is in service [70067892]
THEN:
 - ◆ Direct Unit 1 NCO to **PLACE** #1 ECAC in MANUAL.
 - ◆ Direct Unit 2 NCO to **PLACE** #2 ECAC in MANUAL.
 - C. **OPEN** 1HD1TBX1, 1H 4KV GROUP BUS REG CONTROL POWER FROM 1ADC13.
 - D. **CLOSE** 1HD1TBX2, 1H 4KV GROUP BUS EMER CONTROL POWER FROM 1BDC13.
 - E. IF #1 Station Air Compressor (SAC) is in service [70067892]
AND #1 or #2 ECAC was placed in MANUAL in Step 5.1.8B,
THEN:
 - ◆ Direct Unit 1 NCO to **RETURN** #1 ECAC to AUTO.
 - ◆ Direct Unit 2 NCO to **RETURN** #2 ECAC to AUTO.
 - F. Notify NCO to **ENSURE** Aux. Annunciator Point 0661, 1H 4KV GROUP BUS, LOSS OF 125VDC, alarmed and cleared.
- 5.1.9 **TRANSFER** 1E 4KV Group Bus 125VDC control power, as follows
(1E 4KV Group Bus PT Cubicle):
- A. **NOTIFY** NCO that 1E 4KV Bus control power is to be transferred from 1A 125VDC Bus to 1B 125VDC Bus.
 - B. **OPEN** 1ED1TBX2, 1E 4KV GROUP BUS EMER CONTROL POWER FROM 1ADC13.
 - C. **CLOSE** 1ED1TBX1, 1E 4KV GROUP BUS REG CONTROL POWER FROM 1BDC13.
 - D. Notify NCO to **ENSURE** Aux. Annunciator Point 0666, 1E 4KV GROUP BUS, LOSS OF 125VDC, alarmed and cleared.
- 5.1.10 IF a 1A 125VDC Bus outage is NOT planned
(1A1 OR 1A2 125VDC Battery Charger is to remain in service),
THEN **MARK** Steps 5.1.11 through 5.1.17 as N/A.

- ___ 5.1.11 **TRANSFER 1A 460V Vital Bus 125VDC control power, as follows (1A 460V Bus):**

 - ___ A. **NOTIFY** NCO that 1A 460V Vital Bus control power is to be transferred from 1A 125VDC Bus to 1B 125VDC Bus.
 - ___ B. **OPEN 1AX1AXX1, 1A 460V VITAL BUS REG CONTROL POWER FROM 1ADC35.**
 - ___ C. **CLOSE 1AX1AXX2, 1A 460V VITAL BUS EMER CONTROL POWER FROM 1BDC35.**
 - ___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0785, 1A 460V VITAL BUS, LOSS OF VOLTAGE, alarmed and cleared.
- ___ 5.1.12 **TRANSFER 1E 460V Bus 125VDC control power, as follows (1E 460V Bus):**

 - ___ A. **NOTIFY** NCO that 1E 460V Bus control power is to be transferred from 1A 125VDC Bus to 1B 125VDC Bus.
 - ___ B. **OPEN 1EX1AXX1, 1E 460 VOLT BUS REGULAR CONTROL POWER FROM 1ADC29.**
 - ___ C. **CLOSE 1EX1AXX2, 1E 460 VOLT BUS EMERGENCY CONTROL POWER FROM 1BDC29.**
 - ___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0081, 1E 460V BUS, LOSS OF VOLTAGE, alarmed and cleared.
- ___ 5.1.13 **TRANSFER 1G 460V Bus 125VDC control power, as follows (1G 460V Bus):**

 - ___ A. **NOTIFY** NCO that 1G 460V Bus control power is to be transferred from 1A 125VDC Bus to 1B 125VDC Bus.
 - ___ B. **OPEN 1GX1AXX2, 1G 460 VOLT BUS EMERGENCY CONTROL POWER FROM 1ADC29.**
 - ___ C. **CLOSE 1GX1AXX1, 1G 460 VOLT BUS REGULAR CONTROL POWER FROM 1BDC29.**
 - ___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0084, 1G 460V BUS, LOSS OF VOLTAGE, alarmed and cleared.

- ___ 5.1.14 **TRANSFER** power to 1ADC3AX, 1ADC 125VDC Distribution Cabinet, as follows (84' Swgr Room):
 - ___ A. **NOTIFY** NCO that power to 1ADC3AX 125VDC Distribution Cabinet is to be transferred from 1A 125VDC Bus to 1B 125VDC Bus.
 - ___ B. **OPEN** 1ADC3AXX1, 1ADC DIST CABINET REGULAR POWER FROM 1ADC25.
 - ___ C. **CLOSE** 1ADC3AXX2, 1ADC DIST CABINET EMERGENCY POWER FROM 1BDC25.
 - ___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0036, 1ADC 125VDC DIST. CABINET, LOSS OF VOLT., alarmed and cleared.

___ 5.1.15 **TRANSFER** power to 1ADC2AX, 1AADC 125VDC Distribution Cabinet, as follows (Relay Room):

___ A. IF 12A and 12B CCHXs are to remain in service,
THEN:

___ 1. **RECORD** Service Water flow through 12A CCHX:

1FA16646I _____ gpm

___ 2. **RECORD** Service Water flow through 12B CCHX:

1FA16647I _____ gpm

___ 3. **RECORD** 12A and 12B CCHX outlet temperature:

1TI602B _____ °F (Control Room Console 1CC1)

___ 4. **NOTIFY** NCO that 12SW376 and 12SW380, 12A and 12B CCHX INLET VLVs, are to be locally disengaged from AUTO control.

___ 5. **THROTTLE** 12SW385 until 12SW380 is fully OPEN.

___ 6. At Panel 700-1Z, **CLOSE** 12SW380-A/S, AIR SUPPLY TO 12SW380 (this will lock 12SW380 in the OPEN position).

___ 7. **THROTTLE** 12SW384 until 12SW376 is fully OPEN.

___ 8. At Panel 700-1AE, **CLOSE** 12SW376-A/S, A/S TO 12SW376 (this will lock 12SW376 in the OPEN position).

___ 9. **THROTTLE** the following valves as required to maintain flow and temperature as recorded in Steps 5.1.15A.1, 5.1.15A.2, and 5.1.15A.3.

◆ 12SW385, 12A CCHX INLET VLV

◆ 12SW384, 12B CCHX INLET VLV

(step continued on next page)

5.1.15 (continued)

- ___ B. IF 11 CCHX is to remain in service,
THEN:
 - ___ 1. **RECORD** Service Water flow through 11 CCHX.
1FA3891 _____ gpm
 - ___ 2. **RECORD** 11 CCHX outlet temperature.
1TI602A _____ °F (Control Room Console 1CC1)
 - ___ 3. **NOTIFY** NCO that 11SW122, 11 CCHX SW INLET VLV,
is to be locally disengaged from AUTO control.
 - ___ 4. **ENGAGE** (MANUAL) 11SW122 IAW Attachment 3, Section 1.0.
 - ___ 5. **THROTTLE** 11SW122 to maintain flow and temperature recorded
in Steps 5.1.15B.1 and 5.1.15B.2.
- ___ C. **IMPLEMENT** Operator Action Log IAW SH.OP-AP.ZZ-0110(Q)
for manual control of applicable valves
(11SW122 OR 12SW384 and 12SW385).
- ___ D. **NOTIFY** NCO that power to 1ADC2AX 125VDC Distribution Cabinet
is to be transferred from 1A 125VDC Bus to 1B 125VDC Bus.

(step continued on next page)

5.1.15 (continued)

NOTE

The following valves will close when 1ADC2AX, 1AADC 125VDC Distribution Cabinet, is de-energized during power supply transfers:

- ◆ Containment Radiation Monitor sample valves 1VC8 and 1VC12
- ◆ Letdown Heat Exchanger CC control valve 1CC71
- ◆ Pressurizer Power Operated Relief valve 1PR1
- ◆ 11 CCHX Service Water inlet valve 11SW122 (if in AUTO)

- ___ E. Notify NCO to **PERFORM** the following:
 - ___ 1. **OPEN** Containment APD Sample Backup Isolation Valves.
 - ___ ◆ 1VC13, RMS SAMPLE SUCT VLV
 - ___ ◆ 1VC14, RMS SAMPLE SUCTION VLV
 - ___ ◆ 1VC9, RMS SAMPLE DISCHARGE VLV
 - ___ ◆ 1VC10, RMS SAMPLE DISCHARGE VLV
 - ___ 2. **CLOSE** Containment APD Sample Regular Isolation Valves:
 - ___ ◆ 1VC11, RMS SAMPLE INLET VLV
 - ___ ◆ 1VC12, RMS SAMPLE INLET VLV
 - ___ ◆ 1VC7, RMS SAMPLE OUTLET VLV
 - ___ ◆ 1VC8, RMS SAMPLE OUTLET VLV
 - ___ 3. **SECURE** Letdown IAW S1.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.
 - ___ 4. **EVALUATE** Technical Specification 3.4.9.3 (Refer to Step 3.2.1 - POPS).
- ___ F. **OPEN** 1ADC2AXX1, 1AADC 125VDC DIST CABINET REGULAR POWER FROM 1ADC19.
- ___ G. **CLOSE** 1ADC2AXX2, 1AADC 125VDC DIST CABINET EMERGENCY POWER FROM 1BDC19.

(step continued on next page)

5.1.15 (continued)

- ___ H. Notify NCO to **PERFORM** the following:
 - ___ 1. **ENSURE** Aux. Annunciator Point 0026,
1AADC 125VDC DISTRIB. CABINET, LOSS OF VOLT.,
alarmed and cleared.
 - ___ 2. **OPEN** Containment APD Sample Regular Isolation Valves:
 - ___ ♦ 1VC11
 - ___ ♦ 1VC12
 - ___ ♦ 1VC7
 - ___ ♦ 1VC8
 - ___ 3. **CLOSE** Containment APD Sample Backup Isolation Valves:
 - ___ ♦ 1VC13
 - ___ ♦ 1VC14
 - ___ ♦ 1VC9
 - ___ ♦ 1VC10
 - ___ 4. **ESTABLISH** Letdown IAW S1.OP-SO.CVC-0001(Q),
Charging, Letdown, and Seal Injection.
- ___ I. **RESET** 11SW122, 11 CCHX SW INLET VLV, by momentarily placing
the 43-1 switch to AUTO (located in 11 CCHX Room, Aux Bldg).
- ___ J. IF 11 CCHX is in service,
THEN **PERFORM** Independent Verification IAW Attachment 2,
Section 1.0.
- ___ K. IF 12 CCHX is in service,
THEN **PERFORM** Independent Verification IAW Attachment 2,
Section 2.0.

- ___ 5.1.16 IF the 1EP Pressurizer Heater Bus is NOT C/T IAW Attachment 1,
THEN:

NOTE

Two operators will be required to minimize the time Pressurizer Heater Bus breakers are without tripping capability.

- ___ A. **ENSURE** 1EX1EPX2, 1EP 480V PZR HEATER BUS
EMER CONTROL POWER FROM 1BDC9, in OFF.
- ___ B. **ENSURE** 1EX1EPX1, 1EP 480V PZR HEATER BUS
REG CONTROL POWER FROM 1ADC9, in ON.
- ___ C. **NOTIFY** the NCO that 1EP Pressurizer Heater Bus is to be transferred from
1ADC1AX to 1BDC1AX, AND to expect 1EP 480V PZR HTR BUS/
LOSS OF 125VDC CONTR VOLT alarm.
- ___ D. **OPEN** 1ADC1AX9, 1EP (REG) & 1GP (EMER) PZR HTR BUSES
CONTROL POWER.
- ___ E. **CLOSE** 1BDC1AX9, 1GP (REG) & 1EP (EMER) PZR HTR BUSES
CONTROL POWER.
- ___ F. **PLACE** 1EX1EPX1, 1EP 480V PZR HEATER BUS
REG CONTROL POWER FROM 1ADC9, in OFF.
- ___ G. **PLACE** 1EX1EPX2, 1EP 480V PZR HEATER BUS
EMER CONTROL POWER FROM 1BDC9, in ON.
- ___ H. Notify NCO to **ENSURE** Auxiliary Annunciator 0080,
1EP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT, is clear.

- ___ 5.1.17 IF the 1GP Pressurizer Heater Bus is NOT C/T IAW Attachment 1,
THEN:

NOTE

Two operators will be required to minimize the time pressurizer heater bus breakers are without tripping capability.

- ___ A. **ENSURE** 1GX1EPX1, 1GP 480V PZR HEATER BUS
 REG CONTROL POWER FROM 1BDC9, is OPEN.
- ___ B. **ENSURE** 1GX1EPX2, 1GP 480V PZR HEATER BUS
 EMER CONTROL POWER FROM 1ADC9, is CLOSED.
- ___ C. **NOTIFY** the NCO that 1EP Pressurizer Heater Bus is to be transferred
 from 1ADC1AX to 1BDC1AX AND to expect 1EP 480V PZR HTR BUS/
 LOSS OF 125VDC CONTR VOLT alarm.
- ___ D. **OPEN** 1ADC1AX9, 1EP (REG) & 1GP (EMER) PZR HTR BUSES
 CONTROL POWER.
- ___ E. **CLOSE** 1BDC1AX9, 1GP (REG) & 1EP (EMER) PZR HTR BUSES
 CONTROL POWER.
- ___ F. **OPEN** 1GX1EPX2, 1GP 480V PZR HEATER BUS
 EMER CONTROL POWER FROM 1ADC9.
- ___ G. **CLOSE** 1GX1EPX1, 1GP 480V PZR HEATER BUS
 REG CONTROL POWER FROM 1BDC9.
- ___ H. Notify NCO to **ENSURE** Auxiliary Annunciator 0070,
 1GP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT, is clear.

___ 5.1.18 **OPEN** the following breakers (84' Swgr Room):

- ___ ◆ 1ADC1AX13, NO. 1H & 1E 4KV BUSES CONTROL POWER
1H (REG), 1E (EMER)
- ___ ◆ 1ADC1AX24, 11 EMERGENCY LIGHTING INVERTER
(ALTERNATE FEED)
- ___ ◆ 1ADC1AX30, 1A 4KV VITAL BUS CONTROL POWER (REGULAR)

___ 5.1.19 IF a 1A 125VDC Bus outage is planned
AND all 1A 125VDC Bus loads have been transferred to 1B 125VDC Bus,
THEN:

___ A. **OPEN** the following breakers (84' Swgr Room):

- ___ ◆ 1ADC1AX3, 1A VITAL INSTRUMENT BUS INVERTER
- ___ ◆ 1ADC1AX9, 1EP (REG) & 1GP (EMER) PZR HTR BUSES
CONTROL POWER
- ___ ◆ 1ADC1AX11, SPDS 1A 125VDC BATTERY VOLTAGE
- ___ ◆ 1ADC1AX17, 1A 125VDC BUS CONTROL ROOM
GROUND OHMMETER
- ___ ◆ 1ADC1AX19, 1AADC 125VDC DISTRIBUTION CABINET
(REGULAR)
- ___ ◆ 1ADC1AX23, 1A 125VDC BUS GROUND OHMMETER
(BATTERY CHARGER AREA)
- ___ ◆ 1ADC1AX25, 1ADC 125VDC DISTRIBUTION CABINET
(REGULAR)
- ___ ◆ 1ADC1AX29, NO. 1E & 1G 460V BUSES CONTROL POWER
1E (REG), 1G (EMERG)
- ___ ◆ 1ADC1AX35, 1A 460V VITAL BUS CONTROL POWER (REGULAR)
- ___ ◆ 1ADC1AX18, 1A 125VDC BUS UNDERVOLTAGE RELAY &
CONTROL ROOM VOLTMETER

___ B. **ENSURE** OHA B-2, 1A 125VDC CNTRL BUS VOLT LO, is in alarm.

5.2 **Disconnecting 1A 125VDC Battery from 1A 125VDC Bus**

- 5.2.1 **ENSURE** Section 5.1, Transferring 1A 125VDC Bus Loads to 1B 125VDC Bus is completed.
- 5.2.2 **COMPLETE** S2.OP-SO.CAV-0001(Q), Control Area Ventilation Operation for Operation With Unit 1 EACS Out-Of-Service (Maintenance Mode) (Refer to Step 3.8).
- 5.2.3 **IF** a 1A 125VDC Bus outage is planned,
AND all 1A 125VDC Bus loads have been transferred to 1B 125VDC Bus,
THEN:
 - A. **REMOVE** 1A1 **AND** 1A2 125VDC Battery Charger from service IAW S1.OP-SO.125-0001(Q), 1A 125VDC Battery Charger Operation.
 - B. **IF** 1A 125VDC Battery ammeter indicates >0 amps,
THEN EVALUATE 1A 125VDC Battery loading prior to opening 1ADC1AX39, 1A 125VDC VITAL BATT DISC SWT.
 - C. **OPEN** 1ADC1AX39, 1A 125VDC VITAL BATT DISC SWT (located inside, rear 1ADC1AX cabinet).
 - D. **PERFORM** Independent Verification of components specified in Attachment 2, Sections 3.0 through 7.0.
- 5.2.4 **IF** a 1A 125VDC Bus outage is **NOT** planned,
(planned 1A 125VDC Battery outage only)
THEN:
 - A. **ENSURE** 1A1 **OR** 1A2 125VDC Battery Charger is in service IAW S1.OP-SO.125-0001(Q), 1A 125VDC Battery Charger Operation.
 - B. **IF** 1A 125VDC Battery ammeter indicates >0 amps,
THEN EVALUATE 1A 125VDC Battery loading prior to opening 1ADC1AX39, 1A 125VDC VITAL BATT DISC SWT.
 - C. **OPEN** 1ADC1AX39, 1A 125VDC VITAL BATT DISC SWT (located inside, rear 1ADC1AX cabinet).
 - D. **PERFORM** Independent Verification of components specified in Attachment 2, Sections 8.0 through 11.0.
- 5.2.5 **UPDATE** WCM to reflect component positions IAW Attachment 2.

5.3 Connecting 1A 125VDC Battery to 1A 125VDC Bus**NOTE**

Maintenance may have connected a 1A 125VDC Battery Charger to the battery side of 1ADC1AX39, 1A 125VDC VITAL BATT DISC SWT to raise battery voltage to $\geq 117\text{VDC}$.

- 5.3.1 **ENSURE** Maintenance has disconnected the 1A 125VDC Battery Charger from the battery side of 1ADC1AX39, 1A 125VDC VITAL BATT DISC SWT.

CAUTION

When 1A 125VDC Bus loads are powered from 1A 125VDC Bus, connecting the bus to a partially discharged battery may cause bus voltage to drop to an unacceptable level. The minimum acceptable battery terminal voltage for this condition is 117VDC. Closing the disconnect switch with battery terminal voltage $< 117\text{VDC}$ with loads connected to the bus may result in spurious component actuations. For this reason, the disconnect switch is **NOT** to be closed until all 1A 125VDC Bus loads are transferred to 1B 125VDC Bus **OR** battery terminal voltage is raised to $\geq 117\text{VDC}$.

- 5.3.2 **IF** 1A1 **OR** 1A2 125VDC Battery Charger is supplying power to the 1A 125VDC Bus loads,
THEN ENSURE 1A 125VDC Battery Terminal Voltage is $\geq 117\text{VDC}$ (actual battery terminal voltage is provided by Maintenance).
- 5.3.3 **CLOSE** 1ADC1AX39, 1A 125VDC VITAL BATT DISC SWT (located inside, rear 1ADC1AX cabinet).
- 5.3.4 **IF** restoring 1A 125VDC Bus following a bus outage,
THEN:
- A. **ENSURE** 1A 125V D-C Bus Blown Main Fuses Alarm Cabinet [+] toggle switch and [-] toggle switch are ON.
 - B. **CLOSE** 1ADC1AX18, 1A 125VDC BUS UNDERVOLTAGE RELAY & CONTROL ROOM VOLTMETER (84' Swgr Room).
 - C. **PLACE** 1A1 **OR** 1A2 125VDC Battery Charger in service IAW S1.OP-SO.125-0001(Q), 1A 125VDC Battery Charger Operation.

(step continued on next page)

5.3.4 (continued)

- ___ D. **ENSURE** the following:
 - ___ ♦ 1A 125VDC Bus voltage is >129VDC.
 - ___ ♦ OHA B-2, 1A 125VDC CNTRL BUS VOLT LO, is clear.
 - ___ ♦ 1A 125VDC Battery Blown Fuse lamps are extinguished (1A 125V D-C Bus Blown Main Fuses Alarm Cabinet).
- ___ 5.3.5 **ALIGN** 1A1 AND 1A2 125VDC Battery Chargers as required to support current plant conditions IAW S1.OP-SO.125-0001(Q), 1A 125VDC Battery Charger Operation.
- ___ 5.3.6 **PERFORM** Section 5.4, Returning 1A 125VDC Bus Loads to 1A 125VDC Bus.
- ___ 5.3.7 IF 1A 125VDC Bus was removed from service, THEN **PERFORM** Independent Verification of components specified in Attachment 4, Sections 3.0 through 8.0.
- ___ 5.3.8 IF 1A 125VDC Battery was disconnected from 1A 125VDC Bus AND 1A 125VDC Bus was NOT removed from service, THEN **PERFORM** Independent Verification of components specified in Attachment 4, Sections 8.0 through 12.0.
- ___ 5.3.9 **UPDATE** WCM to reflect component positions IAW Attachment 4.
- ___ 5.3.10 When 1A 125VDC Bus is OPERABLE, as determined by the SM/CRS, **PERFORM** the following:
 - ___ ♦ **INITIATE** S2.OP-SO.CAV-0001(Q), Control Area Ventilation for Restoration From Operation With Unit 1 EACS Out-Of-Service (Maintenance Mode).
 - ___ ♦ **REFER** to T/S Action Statements entered as a result of this procedure for continued applicability.

5.4 **Returning 1A 125VDC Bus Loads to 1A 125VDC Bus**

___ 5.4.1 **ENSURE** 1ADC1AX39, 1A 125VDC VITAL BATT DISC SWT is CLOSED
IAW Section 5.3, Connecting 1A 125VDC Battery to 1A 125VDC Bus.

___ 5.4.2 **CLOSE OR ENSURE CLOSED** the following breakers
(1ADC1AX 125VDC Bus, 84' Swgr Room):

___ ♦ 1ADC1AX3, 1A VITAL INSTRUMENT BUS INVERTER

___ ♦ 1ADC1AX13, NO. 1H & 1E 4KV BUSES CONTROL POWER
1H (REG), 1E (EMER)

___ ♦ 1ADC1AX24, 11 EMERGENCY LIGHTING INVERTER
(ALTERNATE FEED)

___ ♦ 1ADC1AX30, 1A 4KV VITAL BUS CONTROL POWER (REGULAR)

___ 5.4.3 **IF** all 1A 125VDC Bus loads are presently powered from 1B 125VDC Bus,
THEN CLOSE the following breakers:

___ ♦ 1ADC1AX9, 1EP (REG) & 1GP (EMER) PZR HTR BUSES
CONTROL POWER

___ ♦ 1ADC1AX11, SPDS 1A 125VDC BATTERY VOLTAGE

___ ♦ 1ADC1AX17, 1A 125VDC BUS CONTROL ROOM
GROUND OHMMETER

___ ♦ 1ADC1AX19, 1AADC 125VDC DISTRIBUTION CABINET (REGULAR)

___ ♦ 1ADC1AX23, 1A 125VDC BUS GROUND OHMMETER
(BATTERY CHARGER AREA)

___ ♦ 1ADC1AX25, 1ADC 125VDC DISTRIBUTION CABINET (REGULAR)

___ ♦ 1ADC1AX29, NO. 1E & 1G 460V BUSES CONTROL POWER
1E (REG), 1G (EMERG)

___ ♦ 1ADC1AX35, 1A 460V VITAL BUS CONTROL POWER (REGULAR)

NOTE

Steps 5.4.4 through 5.4.16 may be performed in any order or concurrently at the SM/CRS discretion. Equipment identified in Steps 5.4.10 through 5.4.16 may **NOT** have been transferred IAW Section 5.1, Transferring 1A 125VDC Bus Loads to 1B 125VDC Bus.

- ___ 5.4.4 **TRANSFER** 1A 4KV Vital Bus 125VDC control power, as follows
(1A 4KV VITAL BUS 4KV PT's Cubicle rear):
 - ___ A. **NOTIFY** NCO that 1A 4KV Bus control power is to be transferred
from 1B 125VDC Bus to 1A 125VDC Bus.
 - ___ B. **OPEN** 1AD1AXX2, 1A 4KV VITAL BUS EMER CONTROL POWER
FROM 1BDC30.
 - ___ C. **OPEN** 1AD1AXX4, 1A 4KV VITAL BUS EMER ALARM POWER
FROM 1BDC30.
 - ___ D. **CLOSE** 1AD1AXX1, 1A 4KV VITAL BUS REG CONTROL POWER
FROM 1ADC30.
 - ___ E. **CLOSE** 1AD1AXX3, 1A 4KV VITAL BUS REG ALARM POWER
FROM 1ADC30.
 - ___ F. Notify NCO to **ENSURE** the following:
 - ___ ♦ Aux. Annunciator Point 0519,
1A 4KV VITAL BUS, LOSS OF 125VDC, alarmed and cleared.
 - ___ ♦ Aux. Annunciator Point 0530,
1A 4KV VITAL BUS, LOSS OF NORM 125VDC, is clear.
 - ___ ♦ Aux. Annunciator Point 0531,
1A 4KV VITAL BUS CIRCUIT ENERGIZED, is clear.

___ 5.4.5 **TRANSFER 1CW 460V Bus 125VDC control power, as follows:**

CAUTION

During transfer of 125VDC control power to the 1CW 460V Bus, 1CW breakers will not trip on fault conditions, and cannot be remotely operated. Operators should be stationed at the 1CW 460V Bus and 84' Swgr Rooms to facilitate the quick transfer of 1CW Bus control power.

- ___ A. **NOTIFY** NCO that 1CW 460V Bus control power is to be transferred from **2B** 125VDC Bus to **1A** 125VDC Bus.
- ___ B. **OPEN 2BDC1AX15**, 1CW 460V BUS EMERGENCY CONTROL POWER (2BDC1AX 125VDC Bus).
- ___ C. **CLOSE 1ADC1AX15**, 1CW 460V BUS CONTROL POWER (REGULAR), (1ADC1AX 125VDC Bus).
- ___ D. **OPEN 1CW1CW2**, 1CW 460V BUS EMERGENCY CONTROL POWER FROM 2BDC15, (Unit #1 Circ. Water Intake Structure 480V Substation, 1CW-460-PTS-S cabinet).
- ___ E. **CLOSE 1CW1CW1**, 1CW 460V BUS REGULAR CONTROL POWER FROM 1ADC15 (Unit #1 Circ. Water Intake Structure 480V Substation, 1CW-460-PTS-S cabinet).
- ___ F. **IF** LOSS OF DC, UNDERVOLTAGE OR TX HIGH PRESSURE indicating light is illuminated,
THEN:
 - ___ 1. **PRESS** INDICATING LIGHT RESET LOSS OF DC, UNDERVOLTAGE OR TX HIGH PRESSURE pushbutton.
 - ___ 2. **ENSURE** LOSS OF DC, UNDERVOLTAGE OR TX HIGH PRESSURE indicating light is extinguished.
- ___ G. Notify NCO to **ENSURE** Aux. Annunciator Point 0810, 1 CWI 460V BUS/LOSS OF VOLTAGE, alarmed and cleared.

- 5.4.6 **TRANSFER** 13KV North Ring Bus Group "A" and Group "B" Bus
125VDC control power, as follows:

CAUTION

During transfer of 125VDC control power to 13KV North Ring Bus, 13KV breakers will not trip on fault conditions, and cannot be remotely operated. Operators should be stationed at 13KV North Ring Bus and 84' Swgr Rooms to facilitate the quick transfer of 13KV North Ring Bus control power.

- ___ A. **NOTIFY** NCO that 13KV Group "A" and Group "B" Buses control power are to be transferred from 2B 125VDC Bus to 1A 125VDC Bus.
- ___ B. **OPEN** 2BDC1AX22, B7G (REG) & A7G (EMER) 125VDC DISTRIBUTION PANELS, (Unit 2, 2BDC1AX 125VDC Bus)
- ___ C. **CLOSE** 1ADC1AX22, A7G (REG) & B7G (EMER) 125VDC DISTRIBUTION PANELS, (1ADC1AX 125VDC Bus).
- ___ D. **PERFORM** the following at 13KV North Ring Bus Distribution Panel 3J1YDADC:
 - ___ 1. **OPEN** 3J1YDADC-6, 13KV "A" 125VDC PANEL BOARD EMERGENCY FEED FROM 2BDC22.
 - ___ 2. **CLOSE** 3J1YDADC-5, 13KV "A" 125VDC PANEL BOARD REGULAR FEED FROM 1ADC22.
- ___ E. **PERFORM** the following at 13KV North Ring Bus Distribution Panel 3J1YDBDC:
 - ___ 1. **OPEN** 3J1YDBDC-5, 13KV "B" 125VDC PANEL BOARD REGULAR FEED FROM 2BDC22.
 - ___ 2. **CLOSE** 3J1YDBDC-6, 13KV "B" 125VDC PANEL BOARD EMERGENCY FEED FROM 1ADC22.
- ___ F. Notify NCO to **ENSURE** the following:
 - ___ ♦ Unit 2 Aux. Annunciator Point 0190, 13KV GRP BUS B, LOSS OF 125VDC, alarmed and cleared.
 - ___ ♦ Aux. Annunciator Point 0194, 13KV GRP BUS A, LOSS OF 125VDC, alarmed and cleared.

- 5.4.7 **TRANSFER 1H 4KV Group Bus 125VDC control power, as follows**
(1H 4KV Group Bus PT Cubicle):
- A. **NOTIFY** NCO that 1H 4KV Bus control power is to be transferred from 1B 125VDC Bus to 1A 125VDC Bus.
 - B. IF #1 Station Air Compressor (SAC) is in service [70067892]
THEN:
 - ◆ Direct Unit 1 NCO to **PLACE** #1 ECAC in MANUAL.
 - ◆ Direct Unit 2 NCO to **PLACE** #2 ECAC in MANUAL.
 - C. **OPEN** 1HD1TBX2, 1H 4KV GROUP BUS EMER CONTROL POWER FROM 1BDC13.
 - D. **CLOSE** 1HD1TBX1, 1H 4KV GROUP BUS REG CONTROL POWER FROM 1ADC13.
 - E. IF #1 Station Air Compressor (SAC) is in service [70067892]
AND #1 or #2 ECAC was placed in MANUAL in Step 5.4.7B,
THEN:
 - ◆ Direct Unit 1 NCO to **RETURN** #1 ECAC to AUTO.
 - ◆ Direct Unit 2 NCO to **RETURN** #2 ECAC to AUTO.
 - F. Notify NCO to **ENSURE** Aux. Annunciator Point 0661, 1H 4KV GROUP BUS, LOSS OF 125VDC, alarmed and cleared.
- 5.4.8 **TRANSFER 1E 4KV Group Bus 125VDC control power, as follows**
(1E 4KV Group Bus PT Cubicle):
- A. **NOTIFY** NCO that 1E 4KV Bus control power is to be transferred from 1B 125VDC Bus to 1A 125VDC Bus.
 - B. **OPEN** 1ED1TBX1, 1E 4KV GROUP BUS REG CONTROL POWER FROM 1BDC13.
 - C. **CLOSE** 1ED1TBX2, 1E 4KV GROUP BUS EMER CONTROL POWER FROM 1ADC13.
 - D. Notify NCO to **ENSURE** Aux. Annunciator Point 0666, 1E 4KV GROUP BUS, LOSS OF 125VDC, alarmed and cleared.

NOTE

Equipment identified in Steps 5.4.10 through 5.4.16 may **NOT** have been transferred IAW Section 5.1, Transferring 1A 125VDC Bus Loads to 1B 125VDC Bus.

- 5.4.9 IF all 1A 125VDC Bus loads are currently aligned to 1A 125VDC Bus,
THEN **MARK** Steps 5.4.10 through 5.4.16 as N/A.

- ___ 5.4.10 **TRANSFER 1A 460V Vital Bus 125VDC control power, as follows (1A 460V Vital Bus):**
 - ___ A. **NOTIFY** NCO that 1A 460V Vital Bus control power is to be transferred from 1B 125VDC Bus to 1A 125VDC Bus.
 - ___ B. **OPEN 1AX1AXX2, 1A 460V VITAL BUS EMER CONTROL POWER FROM 1BDC35.**
 - ___ C. **CLOSE 1AX1AXX1, 1A 460V VITAL BUS REG CONTROL POWER FROM 1ADC35.**
 - ___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0785, 1A 460V VITAL BUS, LOSS OF VOLTAGE, alarmed and cleared.
- ___ 5.4.11 **TRANSFER 1E 460V Bus 125VDC control power, as follows (1E 460V Bus):**
 - ___ A. **NOTIFY** NCO that 1E 460V Bus control power is to be transferred from 1B 125VDC Bus to 1A 125VDC Bus.
 - ___ B. **OPEN 1EX1AXX2, 1E 460 VOLT BUS EMERGENCY CONTROL POWER FROM 1BDC29.**
 - ___ C. **CLOSE 1EX1AXX1, 1E 460 VOLT BUS REGULAR CONTROL POWER FROM 1ADC29.**
 - ___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0081, 1E 460V BUS, LOSS OF 125VDC CONTROL VOLT, alarmed and cleared.
- ___ 5.4.12 **TRANSFER 1G 460V Bus 125VDC control power, as follows (1G 460V Bus):**
 - ___ A. **NOTIFY** NCO that 1G 460V Bus control power is to be transferred from 1B 125VDC Bus to 1A 125VDC Bus.
 - ___ B. **OPEN 1GX1AXX1, 1G 460 VOLT BUS REGULAR CONTROL POWER FROM 1BDC29.**
 - ___ C. **CLOSE 1GX1AXX2, 1G 460 VOLT BUS EMERGENCY CONTROL POWER FROM 1ADC29.**
 - ___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0084, 1G 460V BUS, LOSS OF 125VDC CONTROL VOLT, alarmed and cleared.

- ___ 5.4.13 **TRANSFER** power to 1ADC (1ADC3AX) 125VDC Distribution Cabinet,
as follows (84' Swgr Room):
- ___ A. **NOTIFY** NCO that power to 1ADC3AX 125VDC Distribution Cabinet
is to be transferred from 1B 125VDC Bus to 1A 125VDC Bus.
- ___ B. **OPEN** 1ADC3AXX2, 1ADC DIST CABINET EMERGENCY POWER
FROM 1BDC25.
- ___ C. **CLOSE** 1ADC3AXX1, 1ADC DIST CABINET REGULAR POWER
FROM 1ADC25.
- ___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0036,
1ADC 125VDC DISTR. CABINET, LOSS OF VOLT., alarmed and cleared.

- ___ 5.4.14 **TRANSFER** power to 1ADC2AX, 1AADC 125VDC Distribution Cabinet, as follows (100' Relay Room):
- ___ A. IF 11 CCHX is in service,
THEN ENSURE 11SW122, 11 CCHX SW INLET VLV,
valve actuator is manually engaged IAW Attachment 3, Section 1.0.
- ___ B. IF 12 CCHX is in service,
THEN ENSURE 12A and 12B CCHX is in service IAW Step 5.1.15A.
- ___ C. **NOTIFY** NCO that power to 1ADC2AX 125VDC Distribution Cabinet is to be transferred from 1B 125VDC Bus to 1A 125VDC Bus.

NOTE

The following valves will close when 1ADC2AX, 1AADC 125VDC Distribution Cabinet, is deenergized during power supply transfers:

- ◆ Containment Radiation Monitor sample valves 1VC8 and 1VC12
- ◆ Letdown Heat Exchanger CC control valve 1CC71
- ◆ Pressurizer Power Operated Relief valve 1PR1
- ◆ 11 CCHX SW inlet valve 11SW122 (Sealed in closed signal, if in AUTO)

- ___ D. Notify NCO to **PERFORM** the following:
- ___ 1. **OPEN** Containment APD Sample Backup Isolation Valves.
- ___ ◆ 1VC13, RMS SAMPLE SUCT VLV
- ___ ◆ 1VC14, RMS SAMPLE SUCTION VLV
- ___ ◆ 1VC9, RMS SAMPLE DISCHARGE VLV
- ___ ◆ 1VC10, RMS SAMPLE DISCHARGE VLV
- ___ 2. **CLOSE** Containment APD Sample Regular Isolation Valves:
- ___ ◆ 1VC11, RMS SAMPLE INLET VLV
- ___ ◆ 1VC12, RMS SAMPLE INLET VLV
- ___ ◆ 1VC7, RMS SAMPLE OUTLET VLV
- ___ ◆ 1VC8, RMS SAMPLE OUTLET VLV
- ___ 3. **SECURE** Letdown IAW S1.OP-SO.CVC-0001(Q),
Charging, Letdown, and Seal Injection.

(step continued on next page)

5.4.14 (continued)

- ___ E. **OPEN** 1ADC2AXX2, 1AADC 125VDC DIST CABINET
EMERGENCY POWER FROM 1BDC19.
- ___ F. **CLOSE** 1ADC2AXX1, 1AADC 125VDC DIST CABINET
REGULAR POWER FROM 1ADC19.
- ___ G. Notify NCO to **PERFORM** the following:
 - ___ 1. **ENSURE** Aux. Annunciator Point 0026,
1AADC 125VDC DISTRIB. CABINET, LOSS OF VOLT.,
alarmed and cleared.
 - ___ 2. **OPEN** Containment APD Sample Regular Isolation Valves:
 - ___ ♦ 1VC11
 - ___ ♦ 1VC12
 - ___ ♦ 1VC7
 - ___ ♦ 1VC8
 - ___ 3. **CLOSE** Containment APD Sample Backup Isolation Valves:
 - ___ ♦ 1VC13
 - ___ ♦ 1VC14
 - ___ ♦ 1VC9
 - ___ ♦ 1VC10
 - ___ 4. **ESTABLISH** Letdown IAW S1.OP-SO.CVC-0001(Q),
Charging, Letdown, and Seal Injection.
 - ___ 5. **EVALUATE** T/S 3.4.9.3 for restoration of POPS CH I solenoid valve.
(Refer to Step 3.2.1)

(step continued on next page)

5.4.14 (continued)

- ___ H. **RESET** 11SW122, 11 CCHX SW INLET VLV, by momentarily placing the 43-1 switch to AUTO (11 CCHX Room).
- ___ I. IF 11 CCHX is in service,
THEN:
 - ___ 1. **NOTIFY** NCO that 11SW122, 11 CCHX INLET VLV, is to be restored to AUTO control.
 - ___ 2. **DISENGAGE** (MANUAL) 11SW122 IAW Attachment 3, Section 2.0.
 - ___ 3. **PERFORM** Independent Verification IAW Attachment 4, Section 1.0.
- ___ J. IF 12A and 12B CCHXs are in service,
THEN:
 - ___ 1. **NOTIFY** NCO that 12SW376 and 12SW380, 12A and 12B CCHX INLET VLVs, are being restored to AUTO control.
 - ___ 2. At Panel 700-1Z, slowly **OPEN** 12SW380-A/S, A/S TO 12SW380 (restores 12SW380 valve control).
 - ___ 3. At Panel 700-1AE, slowly **OPEN** 12SW376-A/S, A/S TO 12SW376 (restores 12SW376 valve control).
 - ___ 4. **OPEN** following 12 CCHX valves:
 - ___ ♦ 12SW385, 12A CCHX INLET VLV
 - ___ ♦ 12SW384, 12B CCHX INLET VLV
 - ___ 5. **ENSURE** 12SW376 and 12SW380 are controlling.
 - ___ 6. **PERFORM** Independent Verification IAW Attachment 4, Section 2.0.
- ___ K. **DISCONTINUE** Operator Action Log IAW SH.OP-AP.ZZ-0110(Q) for manual control of the in service CCHX.

- ___ 5.4.15 IF the 1EP Pressurizer Heater Bus 125 VDC Control Power is aligned to the emergency power supply,
THEN:

NOTE

Two operators will be required to minimize the time pressurizer heater bus breakers are without tripping capability.

- ___ A. **ENSURE** 1EX1EPX1, 1EP 480V PZR HEATER BUS REG CONTROL POWER FROM 1ADC9 in OFF.
- ___ B. **ENSURE** 1EX1EPX2, 1EP 480V PZR HEATER BUS EMER CONTROL POWER FROM 1BDC9 in ON.
- ___ C. **NOTIFY** the NCO that 1EP Pressurizer Heater Bus is to be transferred from 1BDC1AX to 1ADC1AX and to expect 1EP 480V PZR HTR BUS/ LOSS OF 125VDC CONTR VOLT alarm.
- ___ D. **OPEN** 1BDC1AX9, 1GP (REG) & 1EP (EMERG) PZR HTR BUSES CONTROL POWER.
- ___ E. **CLOSE** 1ADC1AX9, 1EP (REG) & 1GP (EMER) PZR HTR BUSES CONTROL POWER.
- ___ F. **OPEN** 1EX1EPX2, 1EP 480V PZR HEATER BUS EMER CONTROL POWER FROM 1BDC9.
- ___ G. **CLOSE** 1EX1EPX1, 1EP 480V PZR HEATER BUS REG CONTROL POWER FROM 1ADC9.
- ___ H. Notify NCO to **ENSURE** Auxiliary Annunciator 0080, 1EP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT clear.

- ___ 5.4.16 IF the 1GP Pressurizer Heater Bus 125 VDC Control Power is aligned to the regular power supply,
THEN:

NOTE

Two operators will be required to minimize the time pressurizer heater bus breakers are without tripping capability.

- ___ A. **ENSURE** 1GX1EPX2, 1GP 480V PZR HEATER BUS EMER CONTROL POWER FROM 1ADC9 in OFF.
 - ___ B. **ENSURE** 1GX1EPX1, 1GP 480V PZR HEATER BUS REG CONTROL POWER FROM 1BDC9 in ON.
 - ___ C. **NOTIFY** the NCO that 1EP Pressurizer Heater Bus is to be transferred from 1BDC1AX to 1ADC1AX AND to expect 1EP 480V PZR HTR BUS/ LOSS OF 125VDC CONTR VOLT alarm.
 - ___ D. **OPEN** 1BDC1AX9, 1GP (REG) & 1EP (EMERG) PZR HTR BUSES CONTROL POWER.
 - ___ E. **CLOSE** 1ADC1AX9, 1EP (REG) & 1GP (EMER) PZR HTR BUSES CONTROL POWER.
 - ___ F. **OPEN** 1GX1EPX1, 1GP 480V PZR HEATER BUS REG CONTROL POWER FROM 1BDC9.
 - ___ G. **CLOSE** 1GX1EPX2, 1GP 480V PZR HEATER BUS EMER CONTROL POWER FROM 1ADC9.
 - ___ H. Notify NCO to **ENSURE** Auxiliary Annunciator 0070, 1GP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT clear.
- ___ 5.4.17 **OPEN OR ENSURE OPEN** the following breakers (84' Swgr Room):
- ___ ◆ 1BDC1AX13, NO. 1E & 1H 4KV BUSES CONTROL POWER 1E (REG), 1H (EMER)
 - ___ ◆ 1BDC1AX30, 1A 4KV VITAL BUS EMERGENCY CONTROL POWER
 - ___ ◆ 1BDC1AX19, 1AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER
 - ___ ◆ 1BDC1AX25, 1ADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER
 - ___ ◆ 1BDC1AX29, NO. 1G & 1E 460V BUSES CONTROL POWER 1G (REG), 1E (EMER)
 - ___ ◆ 1BDC1AX35, 1A 460V VITAL BUS EMERGENCY CONTROL POWER

- 5.4.18 IF 1A 230V Vital Bus is energized,
THEN:

NOTE

Steps 5.4.18A through 5.4.18B may be performed in any order.

- A. **PERFORM** the following IAW S1.OP-SO.115-0011(Q),
1A Vital Instrument Bus UPS System Operation:
1. IF 1A 115V Vital Instrument Bus is de-energized,
THEN PLACE 1A Vital Instrument Bus UPS System in service
AND ENERGIZE 1A 115V Vital Instrument Bus.
 2. IF 1A 115V Vital Instrument Bus is energized from the
AC Line Regulator,
THEN:
 - a. **ENERGIZE** 1A Vital Instrument Bus Rectifier and Inverter
with AC Line Regulator Supplying 1A 115V Vital Instrument Bus.
 - b. **TRANSFER** 1A Vital Instrument Bus from AC Line Regulator
to Inverter.
 3. IF 1A 115V Vital Instrument Bus is energized from the Inverter
with DC Power Supply de-energized,
THEN ENERGIZE DC Power Supply to Inverter.
 4. IF 1A 115V Vital Instrument Bus is powered from a
temporary power supply,
THEN:
 - a. **REMOVE** all loads from 1A 115V Vital Instrument Bus.
 - b. Direct Maintenance to **DE-ENERGIZE** the temporary power supply
AND REMOVE temporary power leads.
 - c. **PLACE** 1A Vital Instrument Bus UPS System in service,
AND ENERGIZE 1A 115V Vital Instrument Bus.

(step continued on next page)

5.4.18 (continued)

- B. **PERFORM** the following IAW S1.OP-SO.115-0005(Q),
11 Emergency Lighting UPS System Operation:
- 1. IF 1AZ1AX, 11 Emergency Lighting Distribution Cabinet, is powered
from the preferred AC source,
THEN ENERGIZE 11 Emergency Lighting Inverter with
Preferred AC Source Supplying 11 Emergency Lighting
Distribution Cabinet.
- 2. IF 1AZ1AX, 11 Emergency Lighting Distribution Cabinet,
is de-energized,
THEN PLACE 11 Emergency Lighting UPS System in service,
AND ENERGIZE 11 Emergency Lighting Distribution Cabinet.
- 5.4.19 IF components specified in Attachment 1, Load Shed are tagged
to support transferring 1A 125VDC Bus loads,
THEN RELEASE the tags.
- 5.4.20 **RELEASE** tag from 1BDC1AX24, 12 EMERGENCY LIGHTING INVERTER
AND RESTORE 12 Emergency Lighting UPS System to normal operation
IAW S1.OP-SO.115-0006(Q), 12 Emergency Lighting UPS System Operation.
- 5.4.21 **COMPLETE** Section 5.3, Connecting 1A 125VDC Battery to 1A 125VDC Bus.

5.5 **Completion and Review**

- _____ 5.5.1 **COMPLETE** Attachment 5, Section 1.0 and 2.0,
AND FORWARD this procedure to the SM/CRS for review and approval.
- _____ 5.5.2 SM/CRS **PERFORM** the following:
 - _____ A. **REVIEW** this procedure with Attachments 1-5 for
completeness and accuracy.
 - _____ B. **COMPLETE** Attachment 5, Section 3.0.
 - _____ C. **FORWARD** completed procedure to Operations Staff.

END OF PROCEDURE SECTION

6.0 RECORDS

6.1 Retain the following IAW RM-AA-101, Records Management Program:

Attachments 1-5

7.0 REFERENCES

7.1 **Updated Final Safety Analysis Report:**

7.1.1 Section 8.3.2, DC Power

7.2 **Technical Specifications - Unit 1:**

None

7.3 **Procedures:**

7.3.1 S1.MD-FR.ZZ-0001(Q), Alternate Power Sources During Refueling Outages

7.3.2 S1.OP-SO.125-0006(Q), 1B 125VDC Bus Operation

7.4 **Drawings:**

7.4.1 203007, No. 1 Unit 125 V.D.C. One Line

7.4.2 211370, 115V. Control System

7.4.3 223720, No. 2 Unit 125 V.D.C. One Line

7.5 **Others:**

7.5.1 1EC-3245 Cyberex Lighting Inverters Installation

7.5.2 1EC-3385, Emergency Lighting Inverters Power Supply Modification

7.5.3 1EC-3389, P250 Plant Computer Replacement

7.5.4 1EC-3446, CCHX Flow Restriction Orifice Installation

7.5.5 1EC-3668, CFCU Service Water Valve Modifications

7.5.6 1EC-3637, Molded Case Circuit Breaker Replacement

7.5.7 DE-CB.125-0018(Q), Low Voltage DC Electrical Systems

7.5.8 S-1-125-EEE-1017, 1A 125V DC Bus to 1B 125V DC Bus Transfer

7.5.9 NSO INCI 94-072, 2A 125VDC Bus UV Relay Not Installed

7.5.10 SER Section 8.3.2, D-C System

7.5.11 SER Supplement 3, Section 8.3.2, Direct Current Power Systems

7.5.12 SER Supplement 4, Section 8.3.2, Direct Current Power Systems

7.6 Cross-References:

7.6.1 Technical Specifications:

- A. 3.4.9.3, Overpressure Protection Systems
- B. 3.7.6.1, Control Room Emergency Air Conditioning System
- C. 3.8.2.4, 125 Volt DC Distribution - Shutdown
- D. 3.8.2.2, A.C. Distribution - Shutdown

7.6.2 Procedures

- A. RM-AA-101, Records Management Program
- B. S1.OP-SO.115-0005(Q), 11 Emergency Lighting UPS System Operation
- C. S1.OP-SO.115-0006(Q), 12 Emergency Lighting UPS System Operation
- D. S1.OP-SO.115-0011(Q), 1A Vital Instrument Bus UPS System Operation
- E. S1.OP-SO.125-0001(Q), 1A 125VDC Battery Charger Operation
- F. S1.OP-SO.125-0004(Q), 125VDC Ground Detection
- G. S1.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection

7.7 Commitments:

None

ATTACHMENT 1
(Page 1 of 4)

125VDC LOAD SHED

NOTES

- ◆ At the occurrence of a Loss Of Off-site Power (LOOP) the station batteries are the only 125VDC power available and must carry the combined loads for one minute until the Emergency Diesel Generators start and load. The intent of this attachment is to minimize the 125VDC electrical loading during a transient which trips the listed AC loads and causes the associated charging spring motors to recharge simultaneously.
- ◆ Each 4KV breaker selected for load shed is to be C/T in the DISCONNECT (OPEN) position. This will prevent the use of the 125VDC Racking Power when the breaker is selected for load shed. The Control Power Breaker may be substituted for selected 460V Breakers.
- ◆ The combined load, spring charging motor/trip coil, associated with each 4KV breaker is ≈ 6.0 amps AND each 460V breaker is ≈ 10.0 amps.

1.0 C/T at least 394 amps of 125VDC controlled loads specified in Steps 1.1, 1.2, and 1.3 to support transferring 1A 125VDC Bus loads to 1B 125VDC Bus.

**ATTACHMENT 1
(Page 2 of 4)**

125VDC LOAD SHED

- ___ 1.1 1A-DF-ECP-1, 1A DIESEL GENERATOR LOCKOUT [40 amps].
- ___ 1.2 4KV BUS LOADS - [each breaker listed is 6.0 amps. 132 amps total]:
 - ___ ♦ 1AD1AX1D, 11 AUXILIARY FEEDWATER PUMP
 - ___ ♦ 1AD1AX2D, 11 CONTAINMENT SPRAY PUMP
 - ___ ♦ 1AD1AX3D, 15 SERVICE WATER PUMP
 - ___ ♦ 1AD1AX5D, 11 SAFETY INJECTION PUMP
 - ___ ♦ 1AD1AX6D, 1A DIESEL GENERATOR BREAKER
 - ___ ♦ 1AD1AX7D, 11 RESIDUAL HEAT REMOVAL PUMP
 - ___ ♦ 1AD1AX8D, 16 SERVICE WATER PUMP
 - ___ ♦ 1AD1AX10D, 11 COMPONENT COOLING WATER PUMP
 - ___ ♦ 1BD1AX1D, 12 AUXILIARY FEEDWATER PUMP
 - ___ ♦ 1BD1AX3D, 13 SERVICE WATER PUMP
 - ___ ♦ 1BD1AX6D, 1B DIESEL GENERATOR BREAKER
 - ___ ♦ 1BD1AX7D, 12 RESIDUAL HEAT REMOVAL PUMP
 - ___ ♦ 1BD1AX8D, 14 SERVICE WATER PUMP
 - ___ ♦ 1BD1AX9D, 11 CHARGING PUMP
 - ___ ♦ 1BD1AX10D, 12 COMPONENT COOLING WATER PUMP
 - ___ ♦ 1ED1TB1D, 12 CONDENSATE PUMP
 - ___ ♦ 1ED1TB4D, 12 REACTOR COOLANT PUMP
 - ___ ♦ 1FD1TB1D, 13 CONDENSATE PUMP
 - ___ ♦ 1FD1TB4D, 13 REACTOR COOLANT PUMP
 - ___ ♦ 1GD1TB4D, 14 REACTOR COOLANT PUMP
 - ___ ♦ 1HD1TB1D, 11 CONDENSATE PUMP
 - ___ ♦ 1HD1TB4D, 11 REACTOR COOLANT PUMP

ATTACHMENT 1
(Page 3 of 4)

125VDC LOAD SHED

- ___ 1.3 460V BUS LOADS - [each breaker listed is 10.0 amps. 420 amps total]:
- ___ ◆ 1AX1AX2X, 11 CONTAINMENT FAN COIL UNIT LOW SPEED
- ___ ◆ 1AX1AX3X, 11 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ◆ 1AX1AX4X, 11 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ◆ 1AX1AX5X, 11 FUEL HANDLING BUILDING EXHAUST FAN
- ___ ◆ 1AX1AX6X, AUXILIARY DEMINERALIZED WATER PUMP
- ___ ◆ 1AX1AX7X, 13 CHARGING PUMP
- ___ ◆ 1AX1AX9X, 11 SWGR RETURN/EXHAUST FAN
- ___ ◆ 1AX1AX10X, 11 PRIMARY WATER MAKE-UP PUMP
- ___ ◆ 1AX1AX12X, 11 AUX BUILDING VENTILATION EXHAUST FAN
- ___ ◆ 1AX1AX13X, 11 CHILLER
- ___ ◆ 1AX1AX14X, 1EP PRESSURIZER HEATER BUS FEED (EMERG)
- ___ ◆ 1AX1AX15X, 11 HYDROGEN RECOMBINER
- ___ ◆ 1AX1AX16X, 11 SWITCHGEAR ROOM SUPPLY
- ___ ◆ 1BX1AX2X, 12 CONTAINMENT FAN COIL UNIT LOW SPEED
- ___ ◆ 1BX1AX3X, 12 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ◆ 1BX1AX4X, 12 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ◆ 1BX1AX5X, 12 FUEL HANDLING BUILDING EXHAUST FAN
- ___ ◆ 1BX1AX6X, 14 CONTAINMENT FAN COIL UNIT LOW SPEED
- ___ ◆ 1BX1AX7X, 14 CONTAINMENT FAN COIL UNIT HIGH SPEED

(step continued on next page)

ATTACHMENT 1
(Page 4 of 4)

125VDC LOAD SHED

1.3 (continued)

- ___ ♦ 1BX1AX8X, 14 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ♦ 1BX1AX9X, 12 SWGR RETURN/EXHAUST FAN
- ___ ♦ 1BX1AX10X, 12 SWITCHGEAR ROOM SUPPLY FAN
- ___ ♦ 1BX1AX11X, 12 AUX BUILDING VENTILATION SUPPLY FAN
- ___ ♦ 1BX1AX12X, 12 AUX BUILDING VENTILATION EXHAUST FAN
- ___ ♦ 1BX1AX13X, 12 CHILLER
- ___ ♦ 1BX1AX14X, 12 SPENT FUEL PIT PUMP
- ___ ♦ 1BX1AX15X, 12 HYDROGEN RECOMBINER
- ___ ♦ 1EX1AX5X, 11 CONTROL ROD DRIVE VENT FAN
- ___ ♦ 1EX1AX6X, 11 WASTE GAS COMPRESSOR
- ___ ♦ 1EX1AX9X, 11 MONITOR TANK PUMP
- ___ ♦ 1EX1AX17X, 12 CONTROL ROD DRIVE VENT FAN
- ___ ♦ 1FX1TB14X, 1 RAW WATER PUMP
- ___ ♦ 1FX1TB22X, 3 DEAERATOR VACUUM PUMP
- ___ ♦ 1GX1AX5X, 13 CONTROL ROD DRIVE VENT FAN
- ___ ♦ 1GX1AX6X, 12 WASTE GAS COMPRESSOR
- ___ ♦ 1GX1AX9X, 12 MONITOR TANK PUMP
- ___ ♦ 1HX1TB11X, 1 DEAERATOR VACUUM PUMP
- ___ ♦ 1HX1TB22X, 3 RAW WATER PUMP
- ___ ♦ 1EX1EPX, 1EP 460V PRESSURIZER HEATER BUS MAIN BKR.
- ___ ♦ 1GX1EP1GP, 1GP 480V PZR HTR BUS B/U SECT MAIN BKR
- ___ ♦ 1GX2EPXA, 1GP 480V PZR HTR BUS CONTROL SECT MAIN BKR

ATTACHMENT 2
(Page 1 of 5)

**INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT**

1.0 11 CCHX SW INLET VLV: (84' Aux Bldg)

VALVE	NAME	POSITION	IV
11SW122	CCHX SW INLET VLV	Manually Jacked	
11SW122	43-1 Switch	AUTO	

2.0 12 CCHX SW INLET VLVS: (84' Aux Bldg)

VALVE	NAME	POSITION	IV
12SW384	12B CCHX SW INLET VLV	(1)	
12SW385	12A CCHX SW INLET VLV	(1)	
11SW122	43-1 Switch	AUTO	

- (1) Throttled as required to maintain Service Water Flow (1FA16646I and 1FA16647I)
AND CCHX outlet temperature (1TI602B) within 3°F of the temperature recorded at Step 5.1.15A.3.

3.0 1ADC1AX 125VDC Bus: (84' Swgr Room)

BREAKER	NAME	POS.	IV
1ADC1AX3	1A VITAL INSTRUMENT BUS INVERTER	OFF	
1ADC1AX9	1EP (REG) & 1GP (EMER) PZR HTR BUSES CONTROL POWER	OFF	
1ADC1AX11	SPDS 1A 125 VDC BATTERY VOLTAGE	OFF	
1ADC1AX13	NO. 1H & 1E 4KV BUSES CONTROL POWER 1H (REG), 1E (EMER)	OFF	
1ADC1AX15	1CW 460V BUS CONTROL POWER (REGULAR)	OFF	
1ADC1AX17	1A 125VDC BUS CONTROL ROOM GROUND OHMMETER	OFF	
1ADC1AX18	1A 125VDC BUS UNDERVOLTAGE RELAY & CONTROL ROOM VOLTMETER	OFF	
1ADC1AX19	1AADC 125VDC DISTRIBUTION CABINET (REGULAR)	OFF	
1ADC1AX22	A7G (REG) & B7G (EMER) 125VDC DISTRIBUTION PANELS	OFF	
1ADC1AX23	1A 125VDC BUS GROUND OHMMETER (BATTERY CHARGER AREA)	OFF	
1ADC1AX24	11 EMERGENCY LIGHTING INVERTER (ALTERNATE FEED)	OFF	
1ADC1AX25	1ADC 125VDC DISTRIBUTION CABINET (REGULAR)	OFF	
1ADC1AX29	NO. 1E & 1G 460V BUSES CONTROL POWER 1E (REG), 1G (EMERG)	OFF	
1ADC1AX30	1A 4KV VITAL BUS REGULAR CONTROL POWER	OFF	
1ADC1AX35	1A 460V VITAL BUS REGULAR CONTROL POWER	OFF	
1ADC1AX39	1A 125VDC VITAL BATT DISC SWT (located inside, rear 1ADC1AX cabinet)	OFF	

ATTACHMENT 2

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INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT4.0 1BDC1AX 125VDC Bus: (84' Swgr Room)

BREAKER	NAME	POS.	IV
1BDC1AX9	1GP (REG) & 1EP (EMER) PZR HTR BUSES CONTROL POWER	ON	
1BDC1AX13	NO. 1E & 1H 4KV BUSES CONTROL POWER 1E (REG), 1H (EMER)	ON	
1BDC1AX19	1AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER	ON	
1BDC1AX25	1ADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER	ON	
1BDC1AX29	NO. 1G & 1E 460V BUSES CONTROL POWER 1G (REG), 1E (EMER)	ON	
1BDC1AX30	1A 4KV VITAL BUS EMERGENCY CONTROL POWER	ON	
1BDC1AX35	1A 460V VITAL BUS EMERGENCY CONTROL POWER	ON	

5.0 2BDC1AX 125VDC Bus: (Unit 2, 84' Swgr Room)

BREAKER	NAME	POS.	IV
2BDC1AX15	1CW 460V BUS EMERGENCY CONTROL POWER	ON	
2BDC1AX22	B7G (REG) & A7G (EMER) 125VDC DISTRIBUTION PANELS	ON	

6.0 DC DISTRIBUTION CABINETS MAIN BREAKER ALIGNMENT:

BREAKER	NAME	POS.	IV
1ADC3AXX1	1ADC DIST CABINET REGULAR POWER FROM 1ADC25	OFF	
1ADC3AXX2	1ADC DIST CABINET EMERGENCY POWER FROM 1BDC25	ON	
1ADC2AXX1	1AADC 125VDC DIST CABINET REGULAR POWER FROM 1ADC19	OFF	
1ADC2AXX2	1AADC 125VDC DIST CABINET EMERGENCY POWER FROM 1BDC19	ON	

ATTACHMENT 2
(Page 3 of 5)

INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT

7.0 AC BUSES CONTROL POWER BREAKER ALIGNMENT:

BREAKER	NAME	POS.	IV
3J1YDADC-5	13KV "A" PANEL BOARD REGULAR FEED FROM 1ADC22	OFF	
3J1YDADC-6	13KV "A" PANEL BOARD EMERGENCY FEED FROM 2BDC22	ON	
3J1YDBDC-5	13KV "B" PANEL BOARD REGULAR FEED FROM 2BDC22	ON	
3J1YDBDC-6	13KV "B" PANEL BOARD EMERGENCY FEED FROM 1ADC22	OFF	
1AX1AXX1	1A 460V VITAL BUS REG CONTROL POWER FROM 1ADC35	OFF	
1AX1AXX2	1A 460V VITAL BUS EMER CONTROL POWER FROM 1BDC35	ON	
1EX1AXX1	1E 460 VOLT BUS REGULAR CONTROL POWER FROM 1ADC29	OFF	
1EX1AXX2	1E 460 VOLT BUS EMERGENCY CONTROL POWER FROM 1BDC29	ON	
1GX1AXX1	1G 460 VOLT BUS REGULAR CONTROL POWER FROM 1BDC29	ON	
1GX1AXX2	1G 460 VOLT BUS EMERGENCY CONTROL POWER FROM 1ADC29	OFF	
1AD1AXX1	1A 4KV VITAL BUS REG CONTROL POWER FROM 1ADC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
1AD1AXX2	1A 4KV VITAL BUS EMER CONTROL POWER FROM 1BDC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
1AD1AXX3	1A 4KV VITAL BUS REG ALARM POWER FROM 1ADC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
1AD1AXX4	1A 4KV VITAL BUS EMER ALARM POWER FROM 1BDC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
1HD1TBX1	1H 4KV GROUP BUS REG CONTROL POWER FROM 1ADC13 (1H 4KV Group Bus PT Cubicle)	OFF	
1HD1TBX2	1H 4KV GROUP BUS EMER CONTROL POWER FROM 1BDC13 (1H 4KV Group Bus PT Cubicle)	ON	
1ED1TBX1	1E 4KV GROUP BUS REG CONTROL POWER FROM 1BDC13 (1E 4KV Group Bus PT Cubicle)	ON	
1ED1TBX2	1E 4KV GROUP BUS EMER CONTROL POWER FROM 1ADC13 (1E 4KV Group Bus PT Cubicle)	OFF	
1CWX1CWX1	1CW 460V BUS REGULAR CONTROL POWER FROM 1ADC15 (CWI Structure, 480V Substation, 1CW-460-PTS-S cabinet)	OFF	
1CWX1CWX2	1CW 460V BUS EMERGENCY CONTROL POWER FROM 2BDC15 (CWI Structure, 480V Substation, 1CW-460-PTS-S cabinet)	ON	

ATTACHMENT 2
(Page 4 of 5)

INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT

8.0 1ADC1AX 125VDC Bus: (84' Swgr Room)

BREAKER	NAME	POS.	IV
1ADC1AX13	NO. 1H & 1E 4KV BUSES CONTROL POWER 1H (REG), 1E (EMER)	OFF	
1ADC1AX15	1CW 460V BUS CONTROL POWER (REGULAR)	OFF	
1ADC1AX24	11 EMERGENCY LIGHTING INVERTER (ALTERNATE FEED)	OFF	
1ADC1AX30	1A 4KV VITAL BUS REGULAR CONTROL POWER	OFF	
1ADC1AX39	1A 125VDC VITAL BATT DISC SWT (located inside, rear 1ADC1AX cabinet)	OFF	

9.0 1BDC1AX 125VDC Bus: (84' Swgr Room)

BREAKER	NAME	POS.	IV
1BDC1AX13	NO. 1E & 1H 4KV BUSES CONTROL POWER 1E (REG), 1H (EMER)	ON	
1BDC1AX30	1A 4KV VITAL BUS EMERGENCY CONTROL POWER	ON	

10.0 2BDC1AX 125VDC Bus: (Unit 2, 84' Swgr Room)

BREAKER	NAME	POS.	IV
2BDC1AX15	1CW 460V BUS EMERGENCY CONTROL POWER	ON	
2BDC1AX22	B7G (REG) & A7G (EMER) 125VDC DISTRIBUTION PANELS	ON	

ATTACHMENT 2
(Page 5 of 5)

INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT

11.0 AC BUSES CONTROL POWER BREAKER ALIGNMENT:

BREAKER	NAME	POS.	IV
3J1YDADC-5	13KV "A" PANEL BOARD REGULAR FEED FROM 1ADC22	OFF	
3J1YDADC-6	13KV "A" PANEL BOARD EMERGENCY FEED FROM 2BDC22	ON	
3J1YDBDC-5	13KV "B" PANEL BOARD REGULAR FEED FROM 2BDC22	ON	
3J1YDBDC-6	13KV "B" PANEL BOARD EMERGENCY FEED FROM 1ADC22	OFF	
1AD1AXX1	1A 4KV VITAL BUS REG CONTROL POWER FROM 1ADC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
1AD1AXX2	1A 4KV VITAL BUS EMER CONTROL POWER FROM 1BDC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
1AD1AXX3	1A 4KV VITAL BUS REG ALARM POWER FROM 1ADC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
1AD1AXX4	1A 4KV VITAL BUS EMER ALARM POWER FROM 1BDC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
1HD1TBX1	1H 4KV GROUP BUS REG CONTROL POWER FROM 1ADC13 (1H 4KV Group Bus PT Cubicle)	OFF	
1HD1TBX2	1H 4KV GROUP BUS EMER CONTROL POWER FROM 1BDC13 (1H 4KV Group Bus PT Cubicle)	ON	
1ED1TBX1	1E 4KV GROUP BUS REG CONTROL POWER FROM 1BDC13 (1E 4KV Group Bus PT Cubicle)	ON	
1ED1TBX2	1E 4KV GROUP BUS EMER CONTROL POWER FROM 1ADC13 (1E 4KV Group Bus PT Cubicle)	OFF	
1CWX1CWX1	1CW 460V BUS REGULAR CONTROL POWER FROM 1ADC15 (CWI Structure, 480V Substation, 1CW-460-PTS-S cabinet)	OFF	
1CWX1CWX2	1CW 460V BUS EMERGENCY CONTROL POWER FROM 2BDC15 (CWI Structure, 480V Substation, 1CW-460-PTS-S cabinet)	ON	

ATTACHMENT 3
(Page 1 of 1)

11SW122, 11 CCHX SW INLET VALVE MANUAL OPERATIONS

1.0 ENGAGE (MANUAL) 11SW122, 11 CCHX SW INLET VLV

- ___ 1.1 SET Bypass Valve to "AUTO" position.
- ___ 1.2 REMOVE Pin located in Gear Cover.
- ___ 1.3 While holding the handwheel, **ROTATE** gear cover in direction of arrow (← to Left), until Full Engagement is audible. Hand-wheel rotation may be required to assist meshing while rotating gear cover.
- ___ 1.4 INSERT Locking Pin
- ___ 1.5 POSITION By-pass Valve to "MANUAL"
- ___ 1.6 POSITION 11SW122 as required.

2.0 DIS-ENGAGE (MANUAL) 11SW122, 11 CCHX SW INLET VLV

NOTE

- ◆ Fully closed = 15 lb output pressure
- ◆ Fully open = 3 lb output pressure

- ___ 2.1 ENSURE valve position as indicated on valves Travel Plate, coincides with Instrument Signal (Ex. Valve halts half open when signal at mid point).
- ___ 2.2 POSITION Bypass valve to "AUTO"
- ___ 2.3 REMOVE Locking Pin, handwheel rotation maybe required to free pin.
- ___ 2.4 While holding the handwheel, **ROTATE** gear cover in direction of arrow (→, to Right)
- ___ 2.5 INSERT Locking Pin.
- ___ 2.6 POSITION valve with pneumatic actuator.

ATTACHMENT 4
(Page 1 of 5)

**INDEPENDENT VERIFICATION
BREAKER & VALVE RESTORATION ALIGNMENT**

1.0 11 CCHX SW INLET VLV: (84' Aux Bldg)

VALVE	NAME	POSITION	IV
11SW122	CCHX SW INLET VLV	Actuator Handwheel Disengaged	
11SW122	43-1 Switch	AUTO	

2.0 12 CCHX SW INLET VLVS: (84' Aux Bldg)

VALVE	NAME	POSITION	IV
12SW376-A/S	AIR SUPPLY TO 12SW376	OPEN	
12SW380-A/S	AIR SUPPLY TO 12SW380	OPEN	
12SW384	12B CCHX INLET VALVE	OPEN	
12SW385	12A CCHX INLET VALVE	OPEN	
11SW122	43-1 Switch	AUTO	

3.0 1ADC1AX 125VDC Bus: (84' Swgr Room)

BREAKER	NAME	POS.	IV
1ADC1AX9	1EP (REG) & 1GP (EMER) PZR HTR BUSES CONTROL POWER	ON	
1ADC1AX11	SPDS 1A 125 VDC BATTERY VOLTAGE	ON	
1ADC1AX13	NO. 1H & 1E 4KV BUSES CONTROL POWER 1H (REG), 1E (EMER)	ON	
1ADC1AX15	1CW 460V BUS CONTROL POWER (REGULAR)	ON	
1ADC1AX17	1A 125VDC BUS CONTROL ROOM GROUND OHMMETER	ON	
1ADC1AX18	1A 125VDC BUS UNDERVOLTAGE RELAY & CONTROL ROOM VOLTMETER	ON	
1ADC1AX19	1AADC 125VDC DISTRIBUTION CABINET (REGULAR)	ON	
1ADC1AX22	A7G (REG) & B7G (EMER) 125VDC DISTRIBUTION PANELS	ON	
1ADC1AX23	1A 125VDC BUS GROUND OHMMETER (BATTERY CHARGER AREA)	ON	
1ADC1AX24	11 EMERGENCY LIGHTING INVERTER (ALTERNATE FEED)	ON	
1ADC1AX25	1ADC 125VDC DISTRIBUTION CABINET (REGULAR)	ON	
1ADC1AX29	NO. 1E & 1G 460V BUSES CONTROL POWER 1E (REG), 1G (EMERG)	ON	
1ADC1AX30	1A 4KV VITAL BUS REGULAR CONTROL POWER	ON	
1ADC1AX35	1A 460V VITAL BUS REGULAR CONTROL POWER	ON	

ATTACHMENT 4
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INDEPENDENT VERIFICATION
BREAKER & VALVE RESTORATION ALIGNMENT

4.0 1BDC1AX 125VDC Bus: (84' Swgr Room)

BREAKER	NAME	POS.	IV
1BDC1AX9	1GP (REG) & 1EP (EMER) PZR HTR BUSES CONTROL POWER	OFF	
1BDC1AX13	NO. 1E & 1H 4KV BUSES CONTROL POWER 1E (REG), 1H (EMER)	OFF	
1BDC1AX19	1AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER	OFF	
1BDC1AX25	1ADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER	OFF	
1BDC1AX29	NO. 1G & 1E 460V BUSES CONTROL POWER 1G(REG), 1E(EMER)	OFF	
1BDC1AX30	1A 4KV VITAL BUS EMERGENCY CONTROL POWER	OFF	
1BDC1AX35	1A 460V VITAL BUS EMERGENCY CONTROL POWER	OFF	

5.0 2BDC1AX 125VDC Bus: (Unit 2, 84' Swgr Room)

BREAKER	NAME	POS.	IV
2BDC1AX15	1CW 460V BUS EMERGENCY CONTROL POWER	OFF	
2BDC1AX22	B7G (REG) & A7G (EMER) 125VDC DISTRIBUTION PANELS	OFF	

6.0 DC DISTRIBUTION CABINETS MAIN BREAKER ALIGNMENT:

BREAKER	NAME	POS.	IV
1ADC3AXX1	1ADC DIST CABINET REGULAR POWER FROM 1ADC25	ON	
1ADC3AXX2	1ADC DIST CABINET EMERGENCY POWER FROM 1BDC25	OFF	
1ADC2AXX1	1AADC 125VDC DIST CABINET REGULAR POWER FROM 1ADC19	ON	
1ADC2AXX2	1AADC 125VDC DIST CABINET EMERGENCY POWER FROM 1BDC19	OFF	

ATTACHMENT 4
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INDEPENDENT VERIFICATION
BREAKER & VALVE RESTORATION ALIGNMENT

7.0 AC BUSES CONTROL POWER BREAKER ALIGNMENT:

BREAKER	NAME	POS	IV
1CWX1CWX1	1CW 460V BUS REGULAR CONTROL POWER FROM 1ADC15 (CWI Structure, 480V Substation, 1CW-460-PTS-S cabinet)	ON	
1CWX1CWX2	1CW 460V BUS EMERGENCY CONTROL POWER FROM 2BDC15 (CWI Structure, 480V Substation, 1CW-460-PTS-S cabinet)	OFF	
3J1YDADC-5	13KV "A" PANEL BOARD REGULAR FEED FROM 1ADC22	ON	
3J1YDADC-6	13KV "A" PANEL BOARD EMERGENCY FEED FROM 2BDC22	OFF	
3J1YDBDC-5	13KV "B" PANEL BOARD REGULAR FEED FROM 2BDC22	OFF	
3J1YDBDC-6	13KV "B" PANEL BOARD EMERGENCY FEED FROM 1ADC22	ON	
1AX1AXX1	1A 460V VITAL BUS REG CONTROL POWER FROM 1ADC35	ON	
1AX1AXX2	1A 460V VITAL BUS EMER CONTROL POWER FROM 1BDC35	OFF	
1EX1AXX1	1E 460 VOLT BUS REGULAR CONTROL POWER FROM 1ADC29	ON	
1EX1AXX2	1E 460 VOLT BUS EMERGENCY CONTROL POWER FROM 1BDC29	OFF	
1GX1AXX1	1G 460 VOLT BUS REGULAR CONTROL POWER FROM 1BDC29	OFF	
1GX1AXX2	1G 460 VOLT BUS EMERGENCY CONTROL POWER FROM 1ADC29	ON	
1AD1AXX1	1A 4KV VITAL BUS REG CONTROL POWER FROM 1ADC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
1AD1AXX2	1A 4KV VITAL BUS EMER CONTROL POWER FROM 1BDC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
1AD1AXX3	1A 4KV VITAL BUS REG ALARM POWER FROM 1ADC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
1AD1AXX4	1A 4KV VITAL BUS EMER ALARM POWER FROM 1BDC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
1HD1TBX1	1H 4KV GROUP BUS REG CONTROL POWER FROM 1ADC13 (1H 4KV Group Bus PT Cubicle)	ON	
1HD1TBX2	1H 4KV GROUP BUS EMER CONTROL POWER FROM 1BDC13 (1H 4KV Group Bus PT Cubicle)	OFF	
1ED1TBX1	1E 4KV GROUP BUS REG CONTROL POWER FROM 1BDC13 (1E 4KV Group Bus PT Cubicle)	OFF	
1ED1TBX2	1E 4KV GROUP BUS EMER CONTROL POWER FROM 1ADC13 (1E 4KV Group Bus PT Cubicle)	ON	

ATTACHMENT 4
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**INDEPENDENT VERIFICATION
BREAKER & VALVE RESTORATION ALIGNMENT**

8.0 BATTERY DISCONNECT SWITCH ALIGNMENT:

BREAKER	NAME	POS.	IV
1ADC1AX39	1A 125VDC VITAL BATT DISC SWT (located inside, rear 1ADC1AX cabinet)	ON	

9.0 1ADC1AX 125VDC Bus: (84' Swgr Room)

BREAKER	NAME	POS.	IV
1ADC1AX13	NO. 1H & 1E 4KV BUSES CONTROL POWER 1H (REG), 1E (EMER)	ON	
1ADC1AX15	1CW 460V BUS CONTROL POWER (REGULAR)	ON	
1ADC1AX22	A7G (REG) & B7G (EMER) 125VDC DISTRIBUTION PANELS	ON	
1ADC1AX30	1A 4KV VITAL BUS REGULAR CONTROL POWER	ON	

10.0 1BDC1AX 125VDC Bus: (84' Swgr Room)

BREAKER	NAME	POS.	IV
1BDC1AX13	NO. 1E & 1H 4KV BUSES CONTROL POWER 1E (REG), 1H (EMER)	OFF	
1BDC1AX30	1A 4KV VITAL BUS EMERGENCY CONTROL POWER	OFF	

11.0 2BDC1AX 125VDC Bus: (Unit 2, 84' Swgr Room)

BREAKER	NAME	POS.	IV
2BDC1AX15	1CW 460V BUS EMERGENCY CONTROL POWER	OFF	
2BDC1AX22	B7G (REG) & A7G (EMER) 125VDC DISTRIBUTION PANELS	OFF	

ATTACHMENT 4
(Page 5 of 5)

INDEPENDENT VERIFICATION
BREAKER & VALVE RESTORATION ALIGNMENT

12.0 AC BUSES CONTROL POWER BREAKER ALIGNMENT:

BREAKER	NAME	POS	IV
1CW1CW1	1CW 460V BUS REGULAR CONTROL POWER FROM 1ADC15 (CWI Structure, 480V Substation, 1CW-460-PTS-S cabinet)	ON	
1CW1CW2	1CW 460V BUS EMERGENCY CONTROL POWER FROM 2BDC15 (CWI Structure, 480V Substation, 1CW-460-PTS-S cabinet)	OFF	
3J1YDADC-5	13KV "A" PANEL BOARD REGULAR FEED FROM 1ADC22	ON	
3J1YDADC-6	13KV "A" PANEL BOARD EMERGENCY FEED FROM 2BDC22	OFF	
3J1YDBDC-5	13KV "B" PANEL BOARD REGULAR FEED FROM 2BDC22	OFF	
3J1YDBDC-6	13KV "B" PANEL BOARD EMERGENCY FEED FROM 1ADC22	ON	
1AD1AXX1	1A 4KV VITAL BUS REG CONTROL POWER FROM 1ADC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
1AD1AXX2	1A 4KV VITAL BUS EMER CONTROL POWER FROM 1BDC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
1AD1AXX3	1A 4KV VITAL BUS REG ALARM POWER FROM 1ADC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
1AD1AXX4	1A 4KV VITAL BUS EMER ALARM POWER FROM 1BDC30 (1A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
1HD1TBX1	1H 4KV GROUP BUS REG CONTROL POWER FROM 1ADC13 (1H 4KV Group Bus PT Cubicle)	ON	
1HD1TBX2	1H 4KV GROUP BUS EMER CONTROL POWER FROM 1BDC13 (1H 4KV Group Bus PT Cubicle)	OFF	
1ED1TBX1	1E 4KV GROUP BUS REG CONTROL POWER FROM 1BDC13 (1E 4KV Group Bus PT Cubicle)	OFF	
1ED1TBX2	1E 4KV GROUP BUS EMER CONTROL POWER FROM 1ADC13 (1E 4KV Group Bus PT Cubicle)	ON	

ATTACHMENT 5
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COMPLETION SIGN-OFF SHEET

1.0 COMMENTS:

(Include procedure deficiencies and corrective actions.)

[illegible]

ATTACHMENT 5
(Page 2 of 2)

COMPLETION SIGN-OFF SHEET

2.0 SIGNATURES:

Print	Initials	Signature	Date
_____	_____	_____	_____
_____	_____	_____	_____
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INDEPENDENT VERIFICATION

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_____	_____	_____	_____

3.0 SM/CRS FINAL REVIEW AND APPROVAL:

This procedure with Attachments 1-5 are reviewed for completeness and accuracy.
 All deficiencies, including corrective actions, are clearly recorded in the COMMENTS Section.

Signature: _____ Date: _____
 SM/CRS