PSEG NUCLEAR L.L.C.
SALEM/OPERATIONS

S2.OP-SO.125-0005(Q) REV. 24

2A 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

REVISION SUMMARY:

♦ The following changes are a result of DCP 80095831: **[80095831]**

- Steps 5.1.15 and 5.4.14, the 125VDC Control Power breakers (2EX1EPX1 and 2EX1EPX2) have been replaced with a single three position selector switch, 2EPX Control Power Switch.
- Steps 5.1.16 and 5.4.15, the 125VDC Control Power breakers (2GX1EPX1 and 2GX1EPX2) have been replaced with two (2) three position selector switches, 2GPX Control Power Switch and 2GPXA Control Power Switch.
- Attachment 2, Section 7.0 and Attachment 4, Section 7.0, have been updated for Independent Verification of selector switch positions (2EPX, 2GPX, and 2GPXA).

IMPLEMENTATION REQUIREMENTS **Effective Date: November 4, 2009**

DCP 80095831, Pressurizer Heater Bus Replacement

2A 125VDC BUS OPERATION

TABLE OF CONTENTS

ATTACHMENTS

1.0 **PURPOSE**

1.1 To provide instructions necessary to:

- ♦ Transfer 2A 125VDC Bus Loads to 2B 125VDC Bus
- ♦ Disconnect 2A 125VDC Battery from 2A 125VDC Bus
- ♦ Connect 2A 125VDC Battery to 2A 125VDC Bus
- ♦ Return 2A 125VDC Bus Loads to 2A 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 **ENSURE** Unit 2 is in Mode 5, 6, or Defueled.

___ 2.4 IF removing 2A 125VDC Bus from service,
(removing both 2A1 AND 2A2 125VDC Battery Chargers from service)
THEN:

___ 2.4.1 **REVIEW** S2.OP-SO.125-0004(Q), 125VDC Ground Detection, for the effects of transferring power sources to the following 125VDC Distribution Cabinets:

- 2ADC3AX, 2ADC 125VDC
- 2ADC2AX, 2AADC 125VDC

___ 2.4.2 **ESTABLISH** conditions specified in Attachment 1 as necessary to support required equipment prior to transferring 2A 125VDC Bus loads to 2B 125VDC Bus to prevent exceeding the one-minute design basis loading on 2B 125VDC Bus.

___ 2.4.3 **NOTIFY** the Electric System Operator that position indications for 500KV BS 1-9 and 9-10 breakers will become momentarily inoperable during 2ADC3AX, 2ADC 125V Distribution Cabinet, power supply transfers.

___ 2.4.4 **PERFORM** Step 2.4.4A OR Step 2.4.4B IAW S2.OP-SO.115-0011(Q), 2A Vital Instrument Bus UPS System Operation:

___ A. IF 2A 115V Vital Instrument Bus is to be removed from service, THEN **DE-ENERGIZE** 2A 115V Vital Instrument Bus, AND **REMOVE** 2A Vital Instrument Bus UPS System from service.

___ B. IF 2A 115V Vital Instrument Bus is to remain in service, THEN **PERFORM** Step 2.4.4B.1 OR Step 2.4.4B.2:

___ 1. IF 2A 115V Vital Instrument Bus is to be energized from the AC Line Regulator, THEN:

___ a. **TRANSFER** 2A 115V Vital Instrument Bus from Inverter to AC Line Regulator.

___ b. **DE-ENERGIZE** 2A Vital Instrument Bus Rectifier and Inverter with AC Line Regulator supplying the 2A Vital Instrument Bus.

___ 2. IF 2A 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 2A Vital Instrument Bus.

___ 2.5 IF removing 2A 125VDC Bus from service,
(removing both 2A1 and 2A2 125VDC Battery Chargers from service)
OR disconnecting 2A 125VDC Battery from 2A 125VDC Bus,
(maintaining 2A1 or 2A2 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 Unit 2, (3.7.6.1 Unit 1) Control Room Emergency Air Conditioning System.

___ ♦ 3.7.10 (Units 1 and 2), Chilled Water System

___ ♦ Action Statement Tracking Log with respect to current expiration dates and 2A 125VDC Bus outage duration.

___ 2.5.2 **INITIATE** S1.OP-SO.CAV-0001(Q), Control Area Ventilation Operation for Operation With Unit 2 EACS Out-Of-Service (Maintenance Mode) (Refer to Step 3.7).

___ 2.5.3 **PERFORM** the following (70068226):

___ ♦ **ENTER** T/S 3.7.6, ACTION f (Unit 2 Modes 5-6)
AND T/S 3.7.6.1 ACTION e/f (Unit 1, Modes 1-4/Modes 5-6).

___ ♦ **SECURE** 2CAA48 OR 2CAA49 CLOSED
IAW S2.OP-SO.CAV-0001(Q), Control Area Ventilation Operation.

___ 2.5.4 **ENSURE** 2B 125VDC Bus is in service.

___ 2.5.5 **ENSURE 1**B 125VDC Bus is in service to provide control power to 2CW 460V Bus.

___ 2.5.6 **ENSURE** all redundant equipment required to be OPERABLE, as a result of transferring 2A 125VDC loads to 2B 125VDC Bus OR disconnecting 2A 125VDC Battery from 2A 125VDC Bus, are OPERABLE. 2A 4KV Vital Bus AND 2A 460/230V Vital Buses are inoperable when 2A 125VDC Battery is disconnected from 2A 125VDC Bus (Safety Evaluation S99-055).

___ 2.5.7 **ENSURE** 22 FHB Exhaust Fan aligned to 2BX1AX5X & 2BX1AX5X* is aligned to their normal power source (Refer to Step 3.4).

___ 2.5.8 **ENSURE** all Temporary Modifications connecting 2B and 2C 125VDC Buses and equipment are removed to maintain electrical train separation and bus operability requirements (Refer to Step 3.4)

___ 2.5.9 **ISOLATE** Chilled Water System "Non-Essential Heat Loads" as required to support current operating conditions IAW S2.OP-SO.CH-0001(Q), Chilled Water System Operation.

___ 2.5.10 **PERFORM** the following actions for 22 Emergency Lighting UPS System:

___ A. **ENSURE** 2BZ1AX, 22 Emergency Lighting Distribution Cabinet is powered from the preferred AC source.

___ B. **DE-ENERGIZE** 22 Emergency Lighting Inverter with preferred AC source supplying 22 Emergency Lighting Distribution Cabinet IAW S2.OP-SO.115-0006(Q), 22 Emergency Lighting UPS System Operation.

___ C. **C/T** 2BDC1AX24, 22 EMERGENCY LIGHTING INVERTER (support transferring 2A 125VDC Bus loads to 2B 125VDC Bus).

___ 2.5.11 IF 2A 230V Vital Bus is to remain energized, THEN:

___ A. **ALIGN** 2A 4KV Vital Bus power supply as required to support any SPT maintenance activities planned during the battery maintenance window IAW S2.OP-SO.4KV-0001(Q), 2A 4KV Vital Bus Operation. (Refer to Step 3.9).

___ B. **PERFORM** the following IAW S2.OP-SO.115-0005(Q), 21 Emergency Lighting UPS System Operation:

___ 1. IF 2AZ1AX, 21 Emergency Lighting Distribution Cabinet (2ELD-A), is energized from 21 Emergency Lighting Inverter, THEN **TRANSFER** 21 Emergency Lighting Distribution Cabinet from 21 Emergency Lighting Inverter to Preferred AC Source.

___ 2. **DE-ENERGIZE** 21 Emergency Lighting Inverter with Preferred AC Source supplying 21 Emergency Lighting Distribution Cabinet.

___ 2.5.12 IF 2A 460/230V Bus outage is planned concurrent with 2A 125VDC Battery outage, THEN **PLACE** 2A2 125VDC Battery Charger in service IAW S2.OP-SO.125-0001(Q), 2A 125VDC Battery Charger Operation.

___ 2.6 IF Section 5.3, Connecting 2A 125VDC Battery to 2A 125VDC Bus is to be performed, THEN **ENSURE** 2A1 OR 2A2 125VDC Battery Charger is available.

___ 2.7 IF Section 5.4, Returning 2A 125VDC Bus Loads to 2A 125VDC Bus is to be performed, THEN **ENSURE** no maintenance or testing is in progress on 2A 125VDC Bus.

3.0 **PRECAUTIONS AND LIMITATIONS**

___ 3.1 Transferring 2ADC2AX, 2AADC 125VDC Distribution Cabinet power supply will result in the following:

___ 3.1.1 Containment Radiation Monitor sample valves 2VC8 and 2VC12 will close.

___ 3.1.2 Letdown Heat Exchanger cooling control valve 2CC71 will close.

___ 3.1.3 Pressurizer Power Operated Relief valve 2PR1 will close.

___ 3.1.4 21SW122 will receive a sealed in CLOSE signal. 21SW122 will be required to be reset when 2AADC 125VDC Distribution Cabinet is re-energized. (43-1 switch, 21 CCHX room)

___ 3.2 Transferring 2ADC2AX, 2AADC Distribution Cabinet, power supply to 2B 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 2B 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 3.4.10.3.)

___ 3.2.2 21SW122 and 22SW122 will be powered from the same bus. A subsequent failure of 2B 125VDC Bus will isolate service water from both Component Cooling Heat Exchangers. To preclude this situation:

___ A. IF 21 CCHX is to remain in-service, THEN 21SW122 will be placed in mechanical MANUAL to maintain CCW temperature and to ensure 10,000 gpm is NOT exceeded.

___ B. IF 22 CCHX is to remain in-service, THEN 22SW122 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-DL.ZZ-0027(Q), Temporary Reading Log & Log Supplement, 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 2TA5074 (2TA5072). 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 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).

___ 3.7 The Control Area Ventilation System is to be placed in Operation With Unit 2 EACS Out-Of-Service (Maintenance Mode) when 2A 125VDC Battery is disconnected from its bus. 21 EACS Fan and CRIX relay (Train A) is inoperable during the 2A 125VDC maintenance window [80069101].

___ 3.8 An Operator should be stationed at the 104 Panel to maintain control of Rad Waste during 125VDC Distribution Cabinet power supply transfers.

___ 3.9 Transferring 2A 4KV Vital Bus power supply during the 2A 125VDC Battery maintenance window will result in a momentary de-energization of the associated 115VAC bus and will cause spurious component actuation.

___ 3.10 The following 500KV breaker regular protection circuits and trip coils are powered from 2A 125VDC Bus:

- 500KV BS 1-9 - Regular Protection Circuit - Trip Coil 1
- 500KV BS 9-10 - 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 2B 125VDC Bus, should be suspended to prevent inadvertent loss of breaker trip capability during periods when 2A 125VDC Bus is powered solely from a battery charger:

- 500KV BS 1-9 - Back-up Protection Circuit - Trip Coil 2
- 500KV BS 9-10 - Back-up Protection Circuit - Trip Coil 2

___ 3.11 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 2A 125VDC Battery Disconnect Switch (2ADC1AX39) is OPEN, OR the component is aligned to its backup 125VDC power supply:

___ ♦ Chilled Water System components [80086263]:

___ • 21 Chiller - The 115VAC control circuit is powered from 2AX1AX13X, 21 Chiller. The compressor will continue to run and perform its protective function on a loss of 2A 125VDC Bus.

___ • 21 Chilled Water Pump - The 115VAC control circuit is powered from 2AY3AX2H, 21 Chilled Water Pump. The pump will continue to run and perform its protective function on a loss of 2A 125VDC Bus.

___ • Chilled Water Isolation valves (1CH150/2CH30) - The valves fail closed and perform their protective function on a loss of 2A 125VDC Bus.

___ ♦ 21 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].

___ ♦ 21 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 2A 125VDC Bus Loads to 2B 125VDC Bus**

___ 5.1.1 **CLOSE** the following breakers, for equipment to remain in service (2BDC1AX 125VDC Bus, Elev. 84′ Swgr Room):

___ ♦ 2BDC1AX13, NO. 2E & 2H 4KV BUSES CONTROL POWER 2E (REG), 2H (EMER)

___ ♦ 2BDC1AX30, 2A 4KV VITAL BUS EMERGENCY CONTROL POWER

___ 5.1.2 IF a 2A 125VDC Bus outage is planned (both 2A 125VDC Battery Chargers are to be removed from service), THEN **CLOSE** the following breakers, for equipment to remain in service:

___ ♦ 2BDC1AX19, 2AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER

___ ♦ 2BDC1AX25, 2ADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER

___ ♦ 2BDC1AX29, NO. 2G & 2E 460V BUSES CONTROL POWER 2G (REG), 2E (EMER)

___ ♦ 2BDC1AX35, 2A 460V VITAL BUS EMERGENCY CONTROL POWER

___ 5.1.3 **ENSURE** the following breakers are CLOSED for equipment to remain in service (2BDC1AX 125VDC Bus, Elev. 84′ Swgr Room):

___ ♦ 2BDC1AX10, NO. 2H & 2F 460V BUSES CONTROL POWER 2H (REG), 2F (EMER)

___ ♦ 2BDC1AX12, NO. 2G & 2F 4KV BUSES CONTROL POWER 2G (REG), 2F (EMER)

___ ♦ 2BDC1AX20, 2BBDC 125VDC DISTRIBUTION CABINET REGULAR POWER

___ ♦ 2BDC1AX26, 2BDC 125VDC DISTRIBUTION CABINET REGULAR POWER

___ ♦ 2BDC1AX31, 2B 4KV VITAL BUS REGULAR CONTROL POWER

___ ♦ 2BDC1AX36, 2B 460V VITAL BUS REGULAR CONTROL POWER

___ 5.1.4 **ENSURE** the following breakers are OPEN (2ADC1AX 125VDC Bus, Elev. 84′ Swgr Room):

___ ♦ 2ADC1AX10, NO. 2F & 2H 460V BUSES CONTROL POWER 2F (REG), 2H (EMER)

___ ♦ 2ADC1AX12, NO. 2F & 2G 4KV BUSES CONTROL POWER 2F (REG), 2G (EMER)

___ ♦ 2ADC1AX20, 2BBDC 125VDC DISTRIBUTION CABINET (EMERGENCY)

___ ♦ 2ADC1AX26, 2BDC 125VDC DISTRIBUTION CABINET (EMERGENCY)

___ ♦ 2ADC1AX31, 2B 4KV VITAL BUS CONTROL POWER (EMERGENCY)

___ ♦ 2ADC1AX36, 2B 460V VITAL BUS CONTROL POWER (EMERGENCY)

NOTE

Steps 5.1.5 through 5.1.16 may be performed in any order or concurrently at the SM/CRS discretion. Steps 5.1.10 through 5.1.16 are only performed when a 2A 125VDC Bus outage is planned.

___ 5.1.5 **TRANSFER** 2A 4KV Vital Bus 125VDC control power, as follows (2A 4KV VITAL BUS 4KV PT's Cubicle rear):

___ A. **NOTIFY** NCO that 2A 4KV Bus control power is to be transferred from 2A 125VDC Bus to 2B 125VDC Bus.

___ B. **OPEN** 2AD1AXX1, 2A 4KV VITAL BUS REG CONTROL POWER FROM 2ADC30.

___ C. **OPEN** 2AD1AXX3, 2A 4KV VITAL BUS REG ALARM POWER FROM 2ADC30.

___ D. **CLOSE** 2AD1AXX2, 2A 4KV VITAL BUS EMER CONTROL POWER FROM 2BDC30.

___ E. **CLOSE** 2AD1AXX4, 2A 4KV VITAL BUS EMER ALARM POWER FROM 2BDC30.

___ F. Notify NCO to **ENSURE** the following:

___ ♦ Aux. Annunciator Point 0519, 2A 4KV VITAL BUS, LOSS OF 125VDC, alarmed and cleared.

___ ♦ Aux. Annunciator Point 0530, 2A 4KV VITAL BUS, LOSS OF NORM 125VDC, is in alarm.

___ ♦ Aux. Annunciator Point 0531, 2A 4KV VITAL BUS CIRCUIT ENERGIZED, is in alarm.

___ 5.1.6 **TRANSFER** 2CW 460V Bus 125VDC control power, as follows:

CAUTION

During transfer of 125VDC control power to 2CW 460V Bus, 2CW breakers will not trip on fault conditions, and cannot be remotely operated. Operators should be stationed at 2CW 460V Bus and Elev. 84′ Switchgear Rooms to facilitate the quick transfer of 2CW Bus control power.

___ A. **NOTIFY** NCO that 2CW 460V Bus control power is to be transferred from 2A 125VDC Bus to **1**B 125VDC Bus.

___ B. **OPEN** 2ADC1AX15, 2CW 460V BUS CONTROL POWER (REGULAR), (2ADC1AX 125VDC Bus, Elev. 84′ Swgr Room).

___ C. **CLOSE** **1**BDC1AX15, 2CW 460V BUS EMERGENCY CONTROL POWER,
(Unit **1**, **1**BDC1AX 125VDC Bus, Elev. 84′ Swgr Room).

___ D. **OPEN** 2CWX1CWX1, 2CW 460V BUS REGULAR CONTROL POWER FROM 2ADC15, (Unit #2 Circ. Water Intake Structure 480V Substation, 2CW-460-PTS-S cabinet).

___ E. **CLOSE** 2CWX1CWX2, 2CW 460V BUS EMERGENCY CONTROL POWER FROM **1**BDC15 (Unit #2 Circ. Water Intake Structure 480V Substation, 2CW-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, 2CWI 460V BUS/LOSS OF VOLTAGE, alarmed and cleared.

___ 5.1.7 **TRANSFER** 2H 4KV Group Bus 125VDC control power, as follows (2H 4KV Group Bus PT Cubicle):

___ A. **NOTIFY** NCO that 2H 4KV Bus control power is to be transferred from 2A 125VDC Bus to 2B 125VDC Bus.

___ B. **OPEN** 2HD1TBX1, 2H 4KV GROUP BUS REG CONTROL POWER FROM 2ADC13.

___ C. **CLOSE** 2HD1TBX2, 2H 4KV GROUP BUS EMER CONTROL POWER FROM 2BDC13.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0661, 2H 4KV GROUP BUS, LOSS OF 125VDC, alarmed and cleared.

___ 5.1.8 **TRANSFER** 2E 4KV Group Bus 125VDC control power, as follows (2E 4KV Group Bus PT Cubicle):

___ A. **NOTIFY** NCO that 2E 4KV Bus control power is to be transferred from 2A 125VDC Bus to 2B 125VDC Bus.

___ B. **OPEN** 2ED1TBX2, 2E 4KV GROUP BUS EMER CONTROL POWER FROM 2ADC13.

___ C. **CLOSE** 2ED1TBX1, 2E 4KV GROUP BUS REG CONTROL POWER FROM 2BDC13.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0666, 2E 4KV GROUP BUS, LOSS OF 125VDC, alarmed and cleared.

___ 5.1.9 IF a 2A 125VDC Bus outage is NOT planned (2A1 OR 2A2 125VDC Battery Charger is to remain in service), THEN **MARK** Steps 5.1.10 through 5.1.16 as N/A.

___ 5.1.10 **TRANSFER** 2A 460V Vital Bus 125VDC control power, as follows (2A 460V Bus):

___ A. **NOTIFY** NCO that 2A 460V Vital Bus control power is to be transferred from 2A 125VDC Bus to 2B 125VDC Bus.

___ B. **OPEN** 2AX1AXX1, 2A 460V VITAL BUS REG CONTROL POWER FROM 2ADC35.

___ C. **CLOSE** 2AX1AXX2, 2A 460V VITAL BUS EMER CONTROL POWER FROM 2BDC35.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0785, 2A 460V VITAL BUS, LOSS OF VOLTAGE, alarmed and cleared.

___ 5.1.11 **TRANSFER** 2E 460V Bus 125VDC control power, as follows (2E 460V Bus):

___ A. **NOTIFY** NCO that 2E 460V Bus control power is to be transferred from 2A 125VDC Bus to 2B 125VDC Bus.

___ B. **OPEN** 2EX1AXX1, 2E 460 VOLT BUS REGULAR CONTROL POWER FROM 2ADC29.

___ C. **CLOSE** 2EX1AXX2, 2E 460 VOLT BUS EMERGENCY CONTROL POWER FROM 2BDC29.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0081, 2E 460V BUS, LOSS OF VOLTAGE, alarmed and cleared.

___ 5.1.12 **TRANSFER** 2G 460V Bus 125VDC control power, as follows (2G 460V Bus):

___ A. **NOTIFY** NCO that 2G 460V Bus control power is to be transferred from 2A 125VDC Bus to 2B 125VDC Bus.

___ B. **OPEN** 2GX1AXX2, 2G 460 VOLT BUS EMERGENCY CONTROL POWER FROM 2ADC29.

___ C. **CLOSE** 2GX1AXX1, 2G 460 VOLT BUS REGULAR CONTROL POWER FROM 2BDC29.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0084, 2G 460V BUS, LOSS OF VOLTAGE, alarmed and cleared.

___ 5.1.13 **TRANSFER** power to 2ADC3AX, 2ADC 125VDC Distribution Cabinet, as follows (Elev. 84′ Swgr Room):

___ A. **NOTIFY** NCO that power to 2ADC3AX 125VDC Distribution Cabinet is to be transferred from 2A 125VDC Bus to 2B 125VDC Bus.

___ B. **OPEN** 2ADC3AXX1, 2ADC DISTRIBUTION CABINET REGULAR POWER FROM 2ADC25.

___ C. **CLOSE** 2ADC3AXX2, 2ADC DISTRIBUTION CABINET EMERGENCY POWER FROM 2BDC25.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0036, 2ADC 125VDC DISTR. CABINET, LOSS OF VOLT, alarmed and cleared.

___ 5.1.14 **TRANSFER** power to 2ADC2AX, 2AADC 125VDC Distribution Cabinet, as follows (Relay Room):

___ A. IF 21 CCHX is to remain in service, THEN:

___ 1. **RECORD** Service Water flow through 21 CCHX:

2FA3891 _____ gpm

___ 2. **RECORD** 21 CCHX outlet temperature:

2TA5072 _____ °F

___ 3. **NOTIFY** NCO that 21SW122, CC HX SW INLET VLV, is to be locally disengaged from AUTO control.

___ 4. **ENGAGE** 21SW122 IAW Attachment 3, Section 1.0.

___ 5. **THROTTLE** 21SW122 to maintain flow and temperature recorded in Steps 5.1.14A.1 and 5.1.14A.2.

___ 6. **IMPLEMENT** Operator Action log IAW SH.OP-DL.ZZ-0027(Q) for 21SW122 Manual Control.

___ B. IF 22 CCHX is to remain in service, THEN:

___ 1. **RECORD** Service Water flow through 22 CCHX:

2FA3892 _____ gpm

___ 2. **RECORD** 22 CCHX outlet temperature:

2TA5074 _____ °F

___ 3. **NOTIFY** NCO that 22SW122, 22 CC HX SW INLET VLV, is to be locally disengaged from AUTO control.

___ 4. **ENGAGE** 22SW122 IAW Attachment 3, Section 1.0.

___ 5. **THROTTLE** 22SW122 to maintain flow and temperature recorded in Steps 5.1.14B.1 and 5.1.14B.2

___ 6. **IMPLEMENT** Operator Action log IAW SH.OP-DL.ZZ-0027(Q) for 22SW122 Manual Control.

(Step continued on next page)

5.1.14 (Continued)

___ C. **NOTIFY** NCO that power to 2ADC2AX 125VDC Distribution Cabinet is to be transferred from 2A 125VDC Bus to 2B 125VDC Bus.

NOTE

The following valves will close when 2ADC2AX, 2AADC 125VDC Distribution Cabinet, is de-energized during power supply transfers:

- Containment Radiation Monitor sample valves 2VC8 and 2VC12
- Letdown Heat Exchanger CC control valve 2CC71
- Pressurizer Power Operated Relief valve 2PR1
- 21 CCHX Service Water inlet valve 21SW122 (when in AUTO)

___ D. Notify NCO to **PERFORM** the following:

___ 1. **OPEN** Containment APD Sample Backup Isolation Valves.

___ ♦ 2VC13, RMS SAMPLE SUCT VLV

___ ♦ 2VC14, RMS SAMPLE SUCTION VLV

___ ♦ 2VC9, RMS SAMPLE DISCHARGE VLV

___ ♦ 2VC10, RMS SAMPLE DISCHARGE VLV

___ 2. **CLOSE** Containment APD Sample Regular Isolation Valves:

___ ♦ 2VC11, RMS SAMPLE INLET VLV

___ ♦ 2VC12, RMS SAMPLE INLET VLV

___ ♦ 2VC7, RMS SAMPLE OUTLET VLV

___ ♦ 2VC8, RMS SAMPLE OUTLET VLV

___ 3. **SECURE** Letdown IAW S2.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.

___ 4. **EVALUATE** Technical Specification 3.4.10.3 (Refer to Step 3.2.1).

(Step continued on next page)

5.1.14 (Continued)

___ E. **OPEN** 2ADC2AXX1, 2AADC 125VDC DISTRIBUTION CABINET REGULAR POWER FROM 2ADC19.

___ F. **CLOSE** 2ADC2AXX2, 2AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER FROM 2BDC19.

___ G. Notify NCO to **PERFORM** the following:

___ 1. **ENSURE** Aux. Annunciator Point 0026, 2AADC 125VDC DISTRIBUTION CABINET, LOSS OF VOLT., alarmed and cleared.

___ 2. **OPEN** Containment APD Sample Regular Isolation Valves:

___ ♦ 2VC11

___ ♦ 2VC12

___ ♦ 2VC7

___ ♦ 2VC8

___ 3. **CLOSE** Containment APD Sample Backup Isolation Valves:

___ ♦ 2VC13

___ ♦ 2VC14

___ ♦ 2VC9

___ ♦ 2VC10

___ 4. **ESTABLISH** Letdown IAW S2.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.

___ H. **RESET** 21SW122, 21 CCHX SW INLET VLV, by momentarily placing the 43-1 switch to AUTO (located in 21 CCHX Room, Aux Bldg).

___ I. IF 21 CCHX is in service, THEN **PERFORM** Independent Verification IAW Attachment 2, Section 1.0.

___ J. IF 22 CCHX is in service, THEN **PERFORM** Independent Verification IAW Attachment 2, Section 2.0.

___ 5.1.15 IF the 2EP 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** 2EX1EP2EPX#, 2EP 480 PZR HTR BUS MN BKR CTR PWR is in the NORMAL 2ADC9 position (78′ EPA).

___ B. **NOTIFY** the NCO that 2EP Pressurizer Heater Bus is to be transferred from 2ADC1AX to 2BDC1AX, AND to expect 2EP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT alarm.

___ C. **OPEN** 2ADC1AX9, 2EP (REG) & 2GP (EMER) PZR HTR BUSES CONTROL POWER.

___ D. **CLOSE** 2BDC1AX9, 2GP (REG) & 2EP (EMER) PZR HTR BUSES CONTROL POWER.

___ E. **PLACE** 2EX1EP2EPX#, 2EP 480 PZR HTR BUS MN BKR CTR PWR in the EMERGENCY 2BDC9 position (78′ EPA).

___ F. Notify NCO to **ENSURE** Aux. Annunciator Point 0080, 2EP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT, is clear.

___ 5.1.16 IF the 2GP 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** 2GX2EP2GPX#, 2GP 480 PZR HTR BUS B/U SECT MN CTR PWR is in the EMERGENCY 2ADC9 position (78′ EPA).

___ B. **ENSURE** 2GX2EP2GPXA#, 2GP 480 PZR HTR BUS CONT SECT MN CTR PWR is in the EMERGENCY 2ADC9 position (78′ EPA).

___ C. **NOTIFY** the NCO that 2GP Pressurizer Heater Bus is to be transferred from 2ADC1AX to 2BDC1AX AND to expect 2GP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT alarm.

___ D. **OPEN** 2ADC1AX9, 2EP (REG) & 2GP (EMER) PZR HTR BUSES CONTROL POWER.

___ E. **CLOSE** 2BDC1AX9, 2GP (REG) & 2EP (EMER) PZR HTR BUSES CONTROL POWER.

___ F. **PLACE** 2GX2EP2GPX#, 2GP 480 PZR HTR BUS B/U SECT MN CTR PWR in the NORMAL 2BDC9 position (78′ EPA).

___ G. **PLACE** 2GX2EP2GPXA#, 2GP 480 PZR HTR BUS CONT SECT MN CTR PWR in the NORMAL 2BDC9 position (78′ EPA).

___ H. Notify NCO to **ENSURE** Aux. Annunciator Point 0070, 2GP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT, is clear.

___ 5.1.17 **OPEN** the following breakers (Elev. 84′ Swgr Room):

___ ♦ 2ADC1AX13, NO. 2H & 2E 4KV BUSES CONTROL POWER 2H (REG), 2E (EMER)

___ ♦ 2ADC1AX24, 21 EMERGENCY LIGHTING INVERTER (ALTERNATE FEED)

___ ♦ 2ADC1AX30, 2A 4KV VITAL BUS CONTROL POWER (REGULAR)

___ 5.1.18 IF a 2A 125VDC Bus outage is planned
AND all 2A 125VDC Bus loads have been transferred to 2B 125VDC Bus,
THEN:

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

___ ♦ 2ADC1AX3, 2A VITAL INSTRUMENT BUS INVERTER

___ ♦ 2ADC1AX9, 2EP (REG) & 2GP (EMER) PZR HTR BUSES CONTROL POWER

___ ♦ 2ADC1AX11, SPDS 2A 125VDC BATTERY VOLTAGE

___ ♦ 2ADC1AX17, 2A 125VDC BUS CONTROL ROOM GROUND OHMMETER

___ ♦ 2ADC1AX19, 2AADC 125VDC DISTR. CABINET (REGULAR)

___ ♦ 2ADC1AX23, 2A 125VDC BUS GROUND OHMMETER (BATTERY CHARGER AREA)

___ ♦ 2ADC1AX25, 2ADC 125VDC DISTR. CABINET (REGULAR)

___ ♦ 2ADC1AX29, NO. 2E & 2G 460V BUSES CONTROL POWER 2E (REG), 2G (EMERG)

___ ♦ 2ADC1AX35, 2A 460V VITAL BUS CONTROL POWER (REGULAR)

___ ♦ 2ADC1AX18, 2A 125VDC BUS UNDERVOLTAGE RELAY & CONTROL ROOM VOLTMETER

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

5.2 **Disconnecting 2A 125VDC Battery from 2A 125VDC Bus**

___ 5.2.1 **ENSURE** Section 5.1, Transferring 2A 125VDC Bus Loads to 2B 125VDC Bus is completed.

___ 5.2.2 **COMPLETE** S1.OP-SO.CAV-0001(Q), Control Area Ventilation Operation for Operation With Unit 2 EACS Out-Of-Service (Maintenance Mode) (Refer to Step 3.7).

___ 5.2.3 IF a 2A 125VDC Bus outage is planned,
AND all 2A 125VDC Bus loads have been transferred to 2B 125VDC Bus,
THEN:

___ A. **REMOVE** 2A1 AND 2A2 125VDC Battery Charger from service IAW S2.OP-SO.125-0001(Q), 2A 125VDC Battery Charger Operation.

___ B. IF 2A 125VDC Battery ammeter indicates >0 amps,
THEN **EVALUATE** 2A 125VDC Battery loading prior to opening 2ADC1AX39, 2A 125VDC VITAL BATT DISC SWT.

___ C. **OPEN** 2ADC1AX39, 2A 125VDC VITAL BATT DISC SWT (located inside, rear 2ADC1AX cabinet).

___ D. **PERFORM** Independent Verification of components specified in Attachment 2, Sections 3.0 through 7.0.

___ 5.2.4 IF a 2A 125VDC Bus outage is NOT planned,
(planned 2A 125VDC Battery outage only)
THEN:

___ A. **ENSURE** 2A1 OR 2A2 125VDC Battery Charger is in service IAW S2.OP-SO.125-0001(Q), 2A 125VDC Battery Charger Operation.

___ B. IF 2A 125VDC Battery ammeter indicates >0 amps,
THEN **EVALUATE** 2A 125VDC Battery loading prior to opening 2ADC1AX39, 2A 125VDC VITAL BATT DISC SWT.

___ C. **OPEN** 2ADC1AX39, 2A 125VDC VITAL BATT DISC SWT (located inside, rear 2ADC1AX 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 2A 125VDC Battery to 2A 125VDC Bus**

NOTE

Maintenance may have connected a 2A 125VDC Battery Charger to the battery side of 2ADC1AX39, 2A 125VDC VITAL BATT DISC SWT to raise battery voltage to ≥117VDC.

___ 5.3.1 **ENSURE** Maintenance has disconnected the 2A 125VDC Battery Charger from the battery side of 2ADC1AX39, 2A 125VDC VITAL BATT DISC SWT.

CAUTION

When 2A 125VDC Bus loads are powered from 2A 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 <117VDC 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 2A 125VDC Bus loads are transferred to 2B 125VDC Bus OR battery terminal voltage is raised to ≥117VDC.

___ 5.3.2 IF 2A1 OR 2A2 125VDC Battery Charger is supplying power to the 2A 125VDC Bus loads,
THEN **ENSURE** 2A 125VDC Battery Terminal Voltage is ≥117VDC.
(actual battery terminal voltage is provided by Maintenance)

___ 5.3.3 **CLOSE** 2ADC1AX39, 2A 125VDC VITAL BATT DISC SWT (located inside, rear 2ADC1AX cabinet).

___ 5.3.4 IF restoring 2A 125VDC Bus following a bus outage,
THEN:

___ A. **ENSURE** 2A 125V D-C Bus Blown Main Fuses Alarm Cabinet [+] toggle switch and [-] toggle switch are ON.

___ B. **CLOSE** 2ADC1AX18, 2A 125VDC BUS UNDERVOLTAGE RELAY & CONTROL ROOM VOLTMETER (Elev. 84′ Swgr Room).

___ C. **PLACE** 2A1 OR 2A2 125VDC Battery Charger in service IAW S2.OP-SO.125-0001(Q), 2A 125VDC Battery Charger Operation.

(step continued on next page)

5.3.4 (Continued)

___ D. **ENSURE** the following:

___ ♦ 2A 125VDC Bus voltage is >129VDC.

___ ♦ OHA B-2, 2A 125VDC CNTRL BUS VOLT LO, is clear.

___ ♦ 2A 125VDC Battery Blown Fuse lamps are extinguished (2A 125V D-C Bus Blown Main Fuses Alarm Cabinet).

___ 5.3.5 **ALIGN** 2A1 AND 2A2 125VDC Battery Chargers as required to support current plant conditions IAW S2.OP-SO.125-0001(Q), 2A 125VDC Battery Charger Operation.

___ 5.3.6 **PERFORM** Section 5.4, Returning 2A 125VDC Bus Loads to 2A 125VDC Bus.

___ 5.3.7 IF 2A 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 2A 125VDC Battery was disconnected from 2A 125VDC Bus AND 2A 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 2A 125VDC Bus is OPERABLE, as determined by the SM/CRS, **PERFORM** the following:

___ ♦ **INITIATE** S1.OP-SO.CAV-0001(Q), Control Area Ventilation for Restoration From Operation With Unit 2 EACS Out-Of-Service (Maintenance Mode).

___ ♦ **ALIGN** Chilled Water System "Non-Essential Heat Loads" as required to support current operating conditions IAW S2.OP-SO.CH-0001(Q), Chilled Water System Operation.

___ ♦ **REFER** to T/S Action Statements entered as a result of this procedure for continued applicability.

5.4 **Returning 2A 125VDC Bus Loads to 2A 125VDC Bus**

___ 5.4.1 **ENSURE** 2ADC1AX39, 2A 125VDC VITAL BATT DISC SWT is CLOSED IAW Section 5.3, Connecting 2A 125VDC Battery to 2A 125VDC Bus.

___ 5.4.2 **CLOSE** OR **ENSURE** CLOSED the following breakers (2ADC1AX 125VDC Bus, Elev. 84′ Swgr Room):

___ ♦ 2ADC1AX3, 2A VITAL INSTRUMENT BUS INVERTER

___ ♦ 2ADC1AX13, NO. 2H & 2E 4KV BUSES CONTROL POWER 2H (REG), 2E (EMER)

___ ♦ 2ADC1AX24, 21 EMERGENCY LIGHTING INVERTER (ALTERNATE FEED)

___ ♦ 2ADC1AX30, 2A 4KV VITAL BUS CONTROL POWER (REGULAR)

___ 5.4.3 IF all 2A 125VDC Bus loads are presently powered from 2B 125VDC Bus, THEN **CLOSE** the following breakers:

___ ♦ 2ADC1AX9, 2EP (REG) & 2GP (EMER) PZR HTR BUSES CONTROL POWER

___ ♦ 2ADC1AX11, SPDS 2A 125VDC BATTERY VOLTAGE

___ ♦ 2ADC1AX17, 2A 125VDC BUS CONTROL ROOM GROUND OHMMETER

___ ♦ 2ADC1AX19, 2AADC 125VDC DISTR. CABINET (REGULAR)

___ ♦ 2ADC1AX23, 2A 125VDC BUS GROUND OHMMETER (BATTERY CHARGER AREA)

___ ♦ 2ADC1AX25, 2ADC 125VDC DISTR. CABINET (REGULAR)

___ ♦ 2ADC1AX29, NO. 2E & 2G 460V BUSES CONTROL POWER 2E (REG), 2G (EMERG)

___ ♦ 2ADC1AX35, 2A 460V VITAL BUS CONTROL POWER (REGULAR)

NOTE

Steps 5.4.4 through 5.4.15 may be performed in any order or concurrently at the SM/CRS discretion. Equipment identified in Steps 5.4.9 through 5.4.15 may NOT have been transferred IAW Section 5.1, Transferring 2A 125VDC Bus Loads to 2B 125VDC Bus.

___ 5.4.4 **TRANSFER** 2A 4KV Vital Bus 125VDC control power, as follows (2A 4KV VITAL BUS 4KV PT's Cubicle rear):

___ A. **NOTIFY** NCO that 2A 4KV Bus control power is to be transferred from 2B 125VDC Bus to 2A 125VDC Bus.

___ B. **OPEN** 2AD1AXX2, 2A 4KV VITAL BUS EMER CONTROL POWER FROM 2BDC30.

___ C. **OPEN** 2AD1AXX4, 2A 4KV VITAL BUS EMER ALARM POWER FROM

___ D. **CLOSE** 2AD1AXX1, 2A 4KV VITAL BUS REG CONTROL POWER FROM 2ADC30.

___ E. **CLOSE** 2AD1AXX3, 2A 4KV VITAL BUS REG ALARM POWER FROM 2ADC30.

___ F. Notify NCO to **ENSURE** the following:

___ ♦ Aux. Annunciator Point 0519, 2A 4KV VITAL BUS, LOSS OF 125VDC, alarmed and cleared.

___ ♦ Aux. Annunciator Point 0530, 2A 4KV VITAL BUS, LOSS OF NORM 125VDC, is clear.

___ ♦ Aux. Annunciator Point 0531, 2A 4KV VITAL BUS CIRCUIT ENERGIZED, is clear.

___ 5.4.5 **TRANSFER** 2CW 460V Bus 125VDC control power, as follows:

CAUTION

During transfer of 125VDC control power to the 2CW 460V Bus, 2CW breakers will NOT trip on fault conditions, and cannot be remotely operated. Operators should be stationed at the 2CW 460V Bus and Elev. 84′ Switchgear Rooms to facilitate the quick transfer of 2CW Bus control power.

___ A. **NOTIFY** NCO that 2CW 460V Bus control power is to be transferred from **1**B 125VDC Bus to 2A 125VDC Bus.

___ B. **OPEN 1**BDC1AX15, 2CW 460V BUS EMERGENCY CONTROL POWER (**1**BDC1AX 125VDC Bus).

___ C. **CLOSE** 2ADC1AX15, 2CW 460V BUS CONTROL POWER (REGULAR), (2ADC1AX 125VDC Bus).

___ D. **OPEN** 2CWX1CWX2, 2CW 460V BUS EMERGENCY CONTROL POWER FROM **1**BDC15, (Unit #2 Circ. Water Intake Structure 480V Substation, 2CW-460-PTS-S cabinet).

___ E. **CLOSE** 2CWX1CWX1, 2CW 460V BUS REGULAR CONTROL POWER FROM 2ADC15 (Unit #2 Circ. Water Intake Structure 480V Substation, 2CW-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, 2CWI 460V BUS/LOSS OF VOLTAGE, alarmed and cleared.

___ 5.4.6 **TRANSFER** 2H 4KV Group Bus 125VDC control power, as follows (2H 4KV Group Bus PT Cubicle):

___ A. **NOTIFY** NCO that 2H 4KV Bus control power is to be transferred from 2B 125VDC Bus to 2A 125VDC Bus.

___ B. **OPEN** 2HD1TBX2, 2H 4KV GROUP BUS EMER CONTROL POWER FROM 2BDC13.

___ C. **CLOSE** 2HD1TBX1, 2H 4KV GROUP BUS REG CONTROL POWER FROM 2ADC13.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0661, 2H 4KV GROUP BUS, LOSS OF 125VDC, alarmed and cleared.

___ 5.4.7 **TRANSFER** 2E 4KV Group Bus 125VDC control power, as follows (2E 4KV Group Bus PT Cubicle):

___ A. **NOTIFY** NCO that 2E 4KV Bus control power is to be transferred from 2B 125VDC Bus to 2A 125VDC Bus.

___ B. **OPEN** 2ED1TBX1, 2E 4KV GROUP BUS REG CONTROL POWER FROM 2BDC13.

___ C. **CLOSE** 2ED1TBX2, 2E 4KV GROUP BUS EMER CONTROL POWER FROM 2ADC13.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0666, 2E 4KV GROUP BUS, LOSS OF 125VDC, alarmed and cleared.

NOTE

Equipment identified in Steps 5.4.9 through 5.4.15 may NOT have been transferred IAW Section 5.1, Transferring 2A 125VDC Bus Loads to 2B 125VDC Bus.

___ 5.4.8 IF all 2A 125VDC Bus loads are currently aligned to 2A 125VDC Bus, THEN **MARK** Steps 5.4.9 through 5.4.15 as N/A.

___ 5.4.9 **TRANSFER** 2A 460V Vital Bus 125VDC control power, as follows (2A 460V Vital Bus):

___ A. **NOTIFY** NCO that 2A 460V Vital Bus control power is to be transferred from 2B 125VDC Bus to 2A 125VDC Bus.

___ B. **OPEN** 2AX1AXX2, 2A 460V VITAL BUS EMER CONTROL POWER FROM 2BDC35.

___ C. **CLOSE** 2AX1AXX1, 2A 460V VITAL BUS REG CONTROL POWER FROM 2ADC35.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0785, 2A 460V VITAL BUS, LOSS OF VOLTAGE, alarmed and cleared.

___ 5.4.10 **TRANSFER** 2E 460V Bus 125VDC control power, as follows (2E 460V Bus):

___ A. **NOTIFY** NCO that 2E 460V Bus control power is to be transferred from 2B 125VDC Bus to 2A 125VDC Bus.

___ B. **OPEN** 2EX1AXX2, 2E 460 VOLT BUS EMERGENCY CONTROL POWER FROM 2BDC29.

___ C. **CLOSE** 2EX1AXX1, 2E 460 VOLT BUS REGULAR CONTROL POWER FROM 2ADC29.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0081, 2E 460V BUS, LOSS OF 125VDC CONTROL VOLT, alarmed and cleared.

___ 5.4.11 **TRANSFER** 2G 460V Bus 125VDC control power, as follows (2G 460V Bus):

___ A. **NOTIFY** NCO that 2G 460V Bus control power is to be transferred from 2B 125VDC Bus to 2A 125VDC Bus.

___ B. **OPEN** 2GX1AXX1, 2G 460 VOLT BUS REGULAR CONTROL POWER FROM 2BDC29.

___ C. **CLOSE** 2GX1AXX2, 2G 460 VOLT BUS EMERGENCY CONTROL POWER FROM 2ADC29.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0084, 2G 460V BUS, LOSS OF 125VDC CONTROL VOLT, alarmed and cleared.

___ 5.4.12 **TRANSFER** power to 2ADC (2ADC3AX) 125VDC Distribution Cabinet, as follows (Elev. 84′ Swgr Room):

___ A. **NOTIFY** NCO that power to 2ADC3AX 125VDC Distribution Cabinet is to be transferred from 2B 125VDC Bus to 2A 125VDC Bus.

___ B. **OPEN** 2ADC3AXX2, 2ADC DISTRIBUTION CABINET EMERGENCY POWER FROM 2BDC25.

___ C. **CLOSE** 2ADC3AXX1, 2ADC DISTRIBUTION CABINET REGULAR POWER FROM 2ADC25.

___ D. Notify NCO to **ENSURE** Aux. Annunciator Point 0036, 2ADC 125VDC DISTR. CABINET, LOSS OF VOLT., alarmed and cleared.

___ 5.4.13 **TRANSFER** power to 2ADC2AX, 2AADC 125VDC Distribution Cabinet, as follows (100′ Relay Room):

___ A. IF 21 CCHX is in service,
THEN **ENSURE** 21SW122, 21 CCHX SW INLET VLV, valve actuator is manually engaged IAW Attachment 3, Section 1.0.

___ B. IF 22 CCHX is in service,
THEN **ENSURE** 22SW122, 22 CCHX SW INLET VLV, valve actuator is manually engaged IAW Attachment 3, Section 1.0.

___ C. **NOTIFY** NCO that power to 2ADC2AX 125VDC Distribution Cabinet is to be transferred from 2B 125VDC Bus to 2A 125VDC Bus.

NOTE

The following valves will close when 2ADC2AX, 2AADC 125VDC Distribution Cabinet, is de-energized during power supply transfers:

- Containment Radiation Monitor sample valves 2VC8 and 2VC12
- Letdown Heat Exchanger CC control valve 2CC71
- Pressurizer Power Operated Relief valve 2PR1
- 21 CCHX SW inlet valve 21SW122 (Sealed in closed signal, when in AUTO)

___ D. Notify NCO to **PERFORM** the following:

___ 1. **OPEN** Containment APD Sample Backup Isolation Valves.

___ ♦ 2VC13, RMS SAMPLE SUCT VLV

___ ♦ 2VC14, RMS SAMPLE SUCTION VLV

___ ♦ 2VC9, RMS SAMPLE DISCHARGE VLV

___ ♦ 2VC10, RMS SAMPLE DISCHARGE VLV

(step continued on next page)

5.4.13 (Continued)

___ 2. **CLOSE** Containment APD Sample Regular Isolation Valves:

___ ♦ 2VC11, RMS SAMPLE INLET VLV

___ ♦ 2VC12, RMS SAMPLE INLET VLV

___ ♦ 2VC7, RMS SAMPLE OUTLET VLV

___ ♦ 2VC8, RMS SAMPLE OUTLET VLV

___ 3. **SECURE** Letdown IAW S2.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.

___ E. **OPEN** 2ADC2AXX2, 2AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER FROM 2BDC19.

___ F. **CLOSE** 2ADC2AXX1, 2AADC 125VDC DISTRIBUTION CABINET REGULAR POWER FROM 2ADC19.

___ G. Notify NCO to **PERFORM** the following:

___ 1. **ENSURE** Aux. Annunciator Point 0026, 2AADC 125VDC DISTRIBUTION CABINET, LOSS OF VOLT., alarmed and cleared.

___ 2. **OPEN** Containment APD Sample Regular Isolation Valves:

___ ♦ 2VC11

___ ♦ 2VC12

___ ♦ 2VC7

___ ♦ 2VC8

___ 3. **CLOSE** Containment APD Sample Backup Isolation Valves:

___ ♦ 2VC13

___ ♦ 2VC14

___ ♦ 2VC9

___ ♦ 2VC10

(step continued on next page)

5.4.13 (Continued)

___ 4. **ESTABLISH** Letdown IAW S2.OP-SO.CVC-0001(Q), Charging, Letdown, and Seal Injection.

___ 5. **EVALUATE** T/S 3.4.10.3 for restoration of POPS CH I solenoid valve. (Refer to Step 3.2.1)

___ H. **RESET** 21SW122, 21 CCHX SW INLET VLV, by momentarily placing the 43-1 switch to AUTO (21 CCHX Room).

___ I. IF 21 CCHX is in service, THEN:

___ 1. **NOTIFY** NCO that 21SW122, 21 CCHX INLET VLV, is to be restored to AUTO control.

___ 2. **DISENGAGE** (MANUAL) 21SW122 IAW Attachment 3, Section 2.0.

___ 3. **PERFORM** Independent Verification IAW Attachment 4, Section 1.0.

___ J. IF 22 CCHX is in service, THEN:

___ 1. **NOTIFY** NCO that 22SW122, 22 CCHX INLET VLV, is to be restored to AUTO control.

___ 2. **DISENGAGE** (MANUAL) 22SW122 IAW Attachment 3, Section 2.0.

___ 3. **PERFORM** Independent Verification IAW Attachment 4, Section 2.0.

___ K. **DISCONTINUE** Operator Action Log IAW SH.OP-DL.ZZ-0027(Q) for manual control of the in service CCHX.

___ 5.4.14 IF the 2EP Pressurizer Heater Bus 125 VDC Control Power is aligned to the backup power supply, THEN:

NOTE

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

___ A. **ENSURE** 2EX1EP2EPX#, 2EP 480 PZR HTR BUS MN BKR CTR PWR is in the EMERGENCY 2BDC9 position (78′ EPA).

___ B. **NOTIFY** the NCO that 2EP Pressurizer Heater Bus is to be transferred from 2BDC1AX to 2ADC1AX and to expect 2EP 480V PZR HTR BUS/ LOSS OF 125VDC CONTR VOLT alarm.

___ C. **OPEN** 2BDC1AX9, 2GP (REG) & 2EP (EMERG) PZR HTR BUSES CONTROL POWER.

___ D. **CLOSE** 2ADC1AX9, 2EP (REG) & 2GP (EMER) PZR HTR BUSES CONTROL POWER.

___ E. **PLACE** 2EX1EP2EPX#, 2EP 480 PZR HTR BUS MN BKR CTR PWR in the NORMAL 2ADC9 position (78′ EPA).

___ F. Notify NCO to **ENSURE** Aux. Annunciator Point 0080, 2EP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT clear.

___ 5.4.15 IF the 2GP 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** 2GX2EP2GPX#, 2GP 480 PZR HTR BUS B/U SECT MN CTR PWR is in the NORMAL 2BDC9 position (78′ EPA).

___ B. **ENSURE** 2GX2EP2GPXA#, 2GP 480 PZR HTR BUS CONT SECT MN CTR PWR is in the NORMAL 2BDC9 position (78′ EPA).

___ C. **NOTIFY** the NCO that 2GP Pressurizer Heater Bus is to be transferred from 2BDC1AX to 2ADC1AX AND to expect 2GP 480V PZR HTR BUS/ LOSS OF 125VDC CONTR VOLT alarm.

___ D. **OPEN** 2BDC1AX9, 2GP (REG) & 2EP (EMERG) PZR HTR BUSES CONTROL POWER.

___ E. **CLOSE** 2ADC1AX9, 2EP (REG) & 2GP (EMER) PZR HTR BUSES CONTROL POWER.

___ F. **PLACE** 2GX2EP2GPX#, 2GP 480 PZR HTR BUS B/U SECT MN CTR PWR in the EMERGENCY 2ADC9 position (78′ EPA).

___ G. **PLACE** 2GX2EP2GPXA#, 2GP 480 PZR HTR BUS CONT SECT MN CTR PWR in the EMERGENCY 2ADC9 position (78′ EPA).

___ H. Notify NCO to **ENSURE** Aux. Annunciator Point 0070, 2GP 480V PZR HTR BUS/LOSS OF 125VDC CONTR VOLT clear.

___ 5.4.16 **OPEN** OR **ENSURE** OPEN the following breakers (Elev. 84′ Swgr Room):

___ ♦ 2BDC1AX13, NO. 2E & 2H 4KV BUSES CONTROL POWER 2E (REG), 2H (EMER)

___ ♦ 2BDC1AX30, 2A 4KV VITAL BUS EMERGENCY CONTROL POWER

___ ♦ 2BDC1AX19, 2AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER

___ ♦ 2BDC1AX25, 2ADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER

___ ♦ 2BDC1AX29, NO. 2G & 2E 460V BUSES CONTROL POWER 2G (REG), 2E (EMER)

___ ♦ 2BDC1AX35, 2A 460V VITAL BUS EMERGENCY CONTROL POWER

___ 5.4.17 IF 2A 230V Vital Bus is energized,
THEN:

NOTE

Steps 5.4.17A and 5.4.17B may be performed in any order.

___ A. **PERFORM** the following IAW S2.OP-SO.115-0011(Q), 2A Vital Instrument Bus UPS System Operation:

___ 1. IF 2A 115V Vital Instrument Bus is de-energized,
THEN **PLACE** 2A Vital Instrument Bus UPS System in service
AND **ENERGIZE** 2A 115V Vital Instrument Bus.

___ 2. IF 2A 115V Vital Instrument Bus is energized from the AC Line Regulator,
THEN:

___ a. **ENERGIZE** 2A Vital Instrument Bus Rectifier and Inverter with AC Line Regulator Supplying 2A 115V Vital Instrument Bus.

___ b. **TRANSFER** 2A Vital Instrument Bus from AC Line Regulator to Inverter.

___ 3. IF 2A 115V Vital Instrument Bus is energized from the Inverter with DC Power Supply de-energized,
THEN **ENERGIZE** DC Power Supply to Inverter.

___ 4. IF 2A 115V Vital Instrument Bus is powered from a temporary power supply,
THEN:

___ a. **REMOVE** all loads from 2A 115V Vital Instrument Bus.

___ b. Direct Maintenance to **DE-ENERGIZE** the temporary power supply AND **REMOVE** temporary power leads.

___ c. **PLACE** 2A Vital Instrument Bus UPS System in service,
AND **ENERGIZE** 2A 115V Vital Instrument Bus.

(step continued on next page)

5.4.17 (Continued)

___ B. **PERFORM** the following IAW S2.OP-SO.115-0005(Q), 21 Emergency Lighting UPS System Operation:

___ 1. IF 2AZ1AX, 21 Emergency Lighting Distribution Cabinet, is powered from the preferred AC source, THEN **ENERGIZE** 21 Emergency Lighting Inverter with Preferred AC Source Supplying 21 Emergency Lighting Distribution Cabinet.

___ 2. IF 2AZ1AX, 21 Emergency Lighting Distribution Cabinet, is de-energized, THEN **PLACE** 21 Emergency Lighting UPS System in service, AND **ENERGIZE** 21 Emergency Lighting Distribution Cabinet.

___ 5.4.18 IF components specified in Attachment 1, Load Shed are tagged to support transferring 2A 125VDC Bus loads, THEN **RELEASE** the tags.

___ 5.4.19 **RELEASE** tag from 2BDC1AX24, 22 EMERGENCY LIGHTING INVERTER AND **RESTORE** 22 Emergency Lighting UPS System to normal operation IAW S2.OP-SO.115-0006(Q), 22 Emergency Lighting UPS System Operation.

___ 5.4.20 **COMPLETE** Section 5.3, Connecting 2A 125VDC Battery to 2A 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 2**:

None

7.3 **Procedures**:

7.3.1 S2.MD-FR.ZZ-0001(Q), Alternate Power Sources During Refueling Outages
7.3.2 S2.OP-SO.125-0006(Q), 2B 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 DCP 2EC-3332, Emergency Lighting Inverter Logic Card Replacement
7.5.2 DCP 2EC-3337, P250 Plant Computer Replacement
7.5.3 DCP 2EC-3567, Molded Case Circuit Breaker Replacement (125 VDC Battery Disconnect Switch)
7.5.4 DCP 2EC-3585, CCW Letdown Temperature Control Valve Mod
7.5.5 DCP 2EC-3590, Generic Letter 96-06 Mods
7.5.6 DE-CB.125-0018(Q), Low Voltage DC Electrical Systems
7.5.7 S-2-125-EEE-1102, 2A 125V DC Bus to 2B 125V DC Bus Transfer
7.5.8 NSO INCI 94-072, 2A 125VDC Bus UV Relay Not Installed
7.5.9 SER Section 8.3.2, D-C System
7.5.10 SER Supplement 3, Section 8.3.2, Direct Current Power Systems
7.5.11 SER Supplement 4, Section 8.3.2, Direct Current Power Systems
7.5.12 DCP 80057549, Integrated Head Assembly

7.6 **Cross-References**:

7.6.1 Technical Specifications:

A. 3.4.10.3, Overpressure Protection Systems
B. 3.7.6, Control Room Emergency Air Conditioning System
C. 3.7.10, Chilled Water System
D. 3.8.2.4, 125 Volt DC Distribution - Shutdown
E. 3.8.2.2, A.C. Distribution - Shutdown

7.6.2 Procedures

A. RM-AA-101, Records Management Program
B. S2.OP-SO.115-0005(Q), 21 Emergency Lighting UPS System Operation
C. S2.OP-SO.115-0006(Q), 22 Emergency Lighting UPS System Operation
D. S2.OP-SO.115-0011(Q), 2A Vital Instrument Bus UPS System Operation
E. S2.OP-SO.125-0001(Q), 2A 125VDC Battery Charger Operation
F. S2.OP-SO.125-0004(Q), 125VDC Ground Detection
G. S2.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 334 amps of 125VDC controlled loads specified in Steps 1.1, 1.2, and 1.3 to support transferring 2A 125VDC Bus loads to 2B 125VDC Bus.

ATTACHMENT 1
(Page 2 of 4)

TRANSFERRING 2A 125VDC BUS LOADS TO 2B 125VDC BUS

___ 1.1 2A-DF-ECP-1, 2A DIESEL GENERATOR LOCKOUT [40 amps].

___ 1.2 4KV BUS LOADS - [each breaker listed is 6.0 amps. 132 amps total]:

- ___ ♦ 2AD1AX1D, 21 AUXILIARY FEEDWATER PUMP
- ___ ♦ 2AD1AX2D, 21 CONTAINMENT SPRAY PUMP
- ___ ♦ 2AD1AX3D, 21 SERVICE WATER PUMP
- ___ ♦ 2AD1AX5D, 21 SAFETY INJECTION PUMP
- ___ ♦ 2AD1AX6D, 2A DIESEL GENERATOR BREAKER
- ___ ♦ 2AD1AX7D, 21 RESIDUAL HEAT REMOVAL PUMP
- ___ ♦ 2AD1AX8D, 22 SERVICE WATER PUMP
- ___ ♦ 2AD1AX10D, 21 COMPONENT COOLING WATER PUMP
- ___ ♦ 2BD1AX1D, 22 AUXILIARY FEEDWATER PUMP
- ___ ♦ 2BD1AX3D, 23 SERVICE WATER PUMP
- ___ ♦ 2BD1AX6D, 2B DIESEL GENERATOR BREAKER
- ___ ♦ 2BD1AX7D, 22 RESIDUAL HEAT REMOVAL PUMP
- ___ ♦ 2BD1AX8D, 24 SERVICE WATER PUMP
- ___ ♦ 2BD1AX9D, 21 CHARGING PUMP
- ___ ♦ 2BD1AX10D, 22 COMPONENT COOLING WATER PUMP
- ___ ♦ 2ED1TB1D, 22 CONDENSATE PUMP
- ___ ♦ 2ED1TB4D, 22 REACTOR COOLANT PUMP
- ___ ♦ 2FD1TB1D, 23 CONDENSATE PUMP
- ___ ♦ 2FD1TB4D, 23 REACTOR COOLANT PUMP
- ___ ♦ 2GD1TB4D, 24 REACTOR COOLANT PUMP
- ___ ♦ 2HD1TB1D, 21 CONDENSATE PUMP
- ___ ♦ 2HD1TB4D, 21 REACTOR COOLANT PUMP

ATTACHMENT 1
(Page 3 of 4)

TRANSFERRING 2A 125VDC BUS LOADS TO 2B 125VDC BUS

___ 1.3 460V BUS LOADS - [each breaker listed is 10.0 amps. 400 amps total]:

- ___ ♦ 2AX1AX2X, 21 CONTAINMENT FAN COIL UNIT LOW SPEED
- ___ ♦ 2AX1AX3X, 21 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ♦ 2AX1AX4X, 21 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ♦ 2AX1AX5X, 21 FUEL HANDLING BUILDING EXHAUST FAN
- ___ ♦ 2AX1AX6X, 2 RADIATION MONITORING SYSTEM
- ___ ♦ 2AX1AX7X, 23 CHARGING PUMP
- ___ ♦ 2AX1AX9X, 21 SWGR RETURN/EXHAUST FAN
- ___ ♦ 2AX1AX10X, 21 PRIMARY WATER MAKE-UP PUMP
- ___ ♦ 2AX1AX12X, 21 AUX BUILDING VENTILATION EXHAUST FAN
- ___ ♦ 2AX1AX13X, 21 CHILLER
- ___ ♦ 2AX1AX14X, 2EP PRESSURIZER HEATER BUS FEED (EMERG)
- ___ ♦ 2AX1AX15X, 21 HYDROGEN RECOMBINER
- ___ ♦ 2AX1AX16X, 21 SWITCHGEAR ROOM SUPPLY
- ___ ♦ 2BX1AX2X, 22 CONTAINMENT FAN COIL UNIT LOW SPEED
- ___ ♦ 2BX1AX3X, 22 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ♦ 2BX1AX4X, 22 CONTAINMENT FAN COIL UNIT HIGH SPEED
- ___ ♦ 2BX1AX5X, 22 FUEL HANDLING BUILDING EXHAUST FAN
- ___ ♦ 2BX1AX6X, 24 CONTAINMENT FAN COIL UNIT LOW SPEED
- ___ ♦ 2BX1AX7X, 24 CONTAINMENT FAN COIL UNIT HIGH SPEED

(step continued on next page)

ATTACHMENT 1
(Page 4 of 4)

TRANSFERRING 2A 125VDC BUS LOADS TO 2B 125VDC BUS

1.3 (Continued)

___ ♦ 2BX1AX8X, 24 CONTAINMENT FAN COIL UNIT HIGH SPEED

___ ♦ 2BX1AX9X, 22 SWGR RETURN/EXHAUST FAN

___ ♦ 2BX1AX10X, 22 SWITCHGEAR ROOM SUPPLY FAN

___ ♦ 2BX1AX11X, 22 AUX BUILDING VENTILATION SUPPLY FAN

___ ♦ 2BX1AX12X, 22 AUX BUILDING VENTILATION EXHAUST FAN

___ ♦ 2BX1AX13X, 22 CHILLER

___ ♦ 2BX1AX14X, 22 SPENT FUEL PIT PUMP

___ ♦ 2BX1AX15X, 22 HYDROGEN RECOMBINER

___ ♦ 2EX1AX5X, 21 CONTROL ROD DRIVE VENT FAN

___ ♦ 2EX1AX6X, 21 WASTE GAS COMPRESSOR

___ ♦ 2EX1AX9X, 21 MONITOR TANK PUMP

___ ♦ 2EX1AX14X, 22 CONTROL ROD DRIVE VENT FAN

___ ♦ 2FX1TB14X, 2 RAW WATER PUMP

___ ♦ 2GX1AX5X, 23 CONTROL ROD DRIVE VENT FAN

___ ♦ 2GX1AX6X, 22 WASTE GAS COMPRESSOR

___ ♦ 2GX1AX9X, 22 MONITOR TANK PUMP

___ ♦ 2HX1TB11X, 2 DEAERATOR VACUUM PUMP

___ ♦ 2HX1TB17X, 6 PRODUCTION WELL PUMP

___ ♦ 2EX1EP2EPX, 2EP 480V PZR HTR BUS MN BKR.

___ ♦ 2GX2EP2GPX, 2GP 480V PZR HTR BUS B/U SECT MN BKR

___ ♦ 2GX1EP2GPXA, 2GP 480V PZR HTR BUS CTL SECT MN BKR

ATTACHMENT 2
(Page 1 of 5)

INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT

1.0 **21 CCHX SW INLET VLV**: (Elev. 84′ Aux Bldg)

VALVE	NAME	POSITION	IV
21SW122	CCHX SW INLET VLV	Manually Jacked	
21SW122	43-1 Switch	AUTO	

2.0 **22 CCHX SW INLET VLVS**: (Elev. 84′ Aux Bldg)

VALVE	NAME	POSITION	IV
22SW122	CCHX SW INLET VLV	Manually Jacked	
22SW122	43-2 Switch	AUTO	

3.0 **2ADC1AX 125VDC Bus**: (Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
2ADC1AX3	2A VITAL INSTRUMENT BUS INVERTER	OFF	
2ADC1AX9	2EP (REG) & 2GP (EMER) PZR HTR BUSES CONTROL POWER	OFF	
2ADC1AX11	SPDS 2A 125 VDC BATTERY VOLTAGE	OFF	
2ADC1AX13	NO. 2H & 2E 4KV BUSES CONTROL POWER 2H (REG), 2E (EMER)	OFF	
2ADC1AX15	2CW 460V BUS CONTROL POWER (REGULAR)	OFF	
2ADC1AX17	2A 125VDC BUS CONTROL ROOM GROUND OHMMETER	OFF	
2ADC1AX18	2A 125VDC BUS UNDERVOLTAGE RELAY & CONTROL ROOM VOLTMETER	OFF	
2ADC1AX19	2AADC 125VDC DISTRIBUTION CABINET (REGULAR)	OFF	
2ADC1AX23	2A 125VDC BUS GROUND OHMMETER (BATTERY CHARGER AREA)	OFF	
2ADC1AX24	21 EMERGENCY LIGHTING INVERTER (ALTERNATE FEED)	OFF	
2ADC1AX25	2ADC 125VDC DISTRIBUTION CABINET (REGULAR)	OFF	
2ADC1AX29	NO. 2E & 2G 460V BUSES CONTROL POWER 2E (REG), 2G (EMERG)	OFF	
2ADC1AX30	2A 4KV VITAL BUS REGULAR CONTROL POWER	OFF	
2ADC1AX35	2A 460V VITAL BUS REGULAR CONTROL POWER	OFF	
2ADC1AX39	2A 125VDC VITAL BATT DISC SWT (located inside, rear 2ADC1AX cabinet)	OFF	

ATTACHMENT 2
(Page 2 of 5)

INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT

4.0 **2BDC1AX 125VDC Bus**: (Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
2BDC1AX9	2GP (REG) & 2EP (EMER) PZR HTR BUSES CONTROL POWER	ON	
2BDC1AX13	NO. 2E & 2H 4KV BUSES CONTROL POWER 2E (REG), 2H (EMER)	ON	
2BDC1AX19	2AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER	ON	
2BDC1AX25	2ADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER	ON	
2BDC1AX29	NO. 2G & 2E 460V BUSES CONTROL POWER 2G (REG), 2E (EMER)	ON	
2BDC1AX30	2A 4KV VITAL BUS EMERGENCY CONTROL POWER	ON	
2BDC1AX35	2A 460V VITAL BUS EMERGENCY CONTROL POWER	ON	

5.0 **1BDC1AX 125VDC Bus**: (Unit **1**, Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
1BDC1AX15	2CW 460V BUS EMERGENCY CONTROL POWER	ON	

6.0 **DC DISTRIBUTION CABINETS MAIN BREAKER ALIGNMENT**:

BREAKER	NAME	POS	IV
2ADC3AXX1	2ADC DISTRIBUTION CABINET REGULAR POWER FROM 2ADC25	OFF	
2ADC3AXX2	2ADC DISTRIBUTION CABINET EMERGENCY POWER FROM 2BDC25	ON	
2ADC2AXX1	2AADC 125VDC DISTRIBUTION CABINET REGULAR POWER FROM 2ADC19	OFF	
2ADC2AXX2	2AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER FROM 2BDC19	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
2AX1AXX1	2A 460V VITAL BUS REG CONTROL POWER FROM 2ADC35	OFF	
2AX1AXX2	2A 460V VITAL BUS EMER CONTROL POWER FROM 2BDC35	ON	
2EX1AXX1	2E 460 VOLT BUS REGULAR CONTROL POWER FROM 2ADC29	OFF	
2EX1AXX2	2E 460 VOLT BUS EMERGENCY CONTROL POWER FROM 2BDC29	ON	
2GX1AXX1	2G 460 VOLT BUS REGULAR CONTROL POWER FROM 2BDC29	ON	
2GX1AXX2	2G 460 VOLT BUS EMERGENCY CONTROL POWER FROM 2ADC29	OFF	
2AD1AXX1	2A 4KV VITAL BUS REG CONTROL POWER FROM 2ADC30 (2A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
2AD1AXX2	2A 4KV VITAL BUS EMER CONTROL POWER FROM 2BDC30 (2A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
2AD1AXX3	2A 4KV VITAL BUS REG ALARM POWER FROM 2ADC30 (2A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
2AD1AXX4	2A 4KV VITAL BUS EMER ALARM POWER FROM 2BDC30 (2A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
2HD1TBX1	2H 4KV GROUP BUS REG CONTROL POWER FROM 2ADC13 (2H 4KV Group Bus PT Cubicle)	OFF	
2HD1TBX2	2H 4KV GROUP BUS EMER CONTROL POWER FROM 2BDC13 (2H 4KV Group Bus PT Cubicle)	ON	
2ED1TBX1	2E 4KV GROUP BUS REG CONTROL POWER FROM 2BDC13 (2E 4KV Group Bus PT Cubicle)	ON	
2ED1TBX2	2E 4KV GROUP BUS EMER CONTROL POWER FROM 2ADC13 (2E 4KV Group Bus PT Cubicle)	OFF	
2CWX1CWX1	2CW 460V BUS REGULAR CONTROL POWER FROM 2ADC15 (CWI Structure, 480V Substation, 2CW-460-PTS-S cabinet)	OFF	
2CWX1CWX2	2CW 460V BUS EMERGENCY CONTROL POWER FROM 1BDC15 (CWI Structure, 480V Substation, 2CW-460-PTS-S cabinet)	ON	

(Continued on next page)

ATTACHMENT 2
(Page 4 of 5)

INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT

7.0 **AC BUSES CONTROL POWER BREAKER ALIGNMENT** (78′ EPA) (continued):

SWITCH	NAME	POS	IV
2EX1EP2EPX#	2EP 480 PZR HTR BUS MN BKR CTR PWR	EMERGENCY 2BDC9	
2GX2EP2GPX#	2GP 480 PZR HTR BUS B/U SECT MN CTR PWR	NORMAL 2BDC9	
2GX2EP2GPXA#	2GP 480 PZR HTR BUS CONT SECT MN CTR PWR	NORMAL 2BDC9	

8.0 **2ADC1AX 125VDC Bus**: (Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
2ADC1AX13	NO. 2H & 2E 4KV BUSES CONTROL POWER 2H (REG), 2E (EMER)	OFF	
2ADC1AX15	2CW 460V BUS CONTROL POWER (REGULAR)	OFF	
2ADC1AX24	21 EMERGENCY LIGHTING INVERTER (ALTERNATE FEED)	OFF	
2ADC1AX30	2A 4KV VITAL BUS REGULAR CONTROL POWER	OFF	
2ADC1AX39	2A 125VDC VITAL BATT DISC SWT (located inside, rear 2ADC1AX cabinet)	OFF	

9.0 **2BDC1AX 125VDC Bus**: (Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
2BDC1AX13	NO. 2E & 2H 4KV BUSES CONTROL POWER 2E (REG), 2H (EMER)	ON	
2BDC1AX30	2A 4KV VITAL BUS EMERGENCY CONTROL POWER	ON	

10.0 **1BDC1AX 125VDC Bus**: (Unit **1**, Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
1BDC1AX15	2CW 460V BUS EMERGENCY CONTROL POWER	ON	

ATTACHMENT 2
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INDEPENDENT VERIFICATION
ALTERNATE POWER SUPPLY ALIGNMENT

11.0 **AC BUSES CONTROL POWER BREAKER ALIGNMENT**:

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

ATTACHMENT 3
(Page 1 of 1)

CCHX SW INLET VALVE MANUAL OPERATIONS

1.0 **ENGAGE (MANUAL) SW122, 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** SW122 as required.

2.0 **DIS-ENGAGE (MANUAL) SW122, 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 **21 CCHX SW INLET VLV**: (Elev. 84′ Aux Bldg)

VALVE	NAME	POSITION	IV
21SW122	CCHX SW INLET VLV	Actuator Handwheel Disengaged	
21SW122	43-1 Switch	AUTO	

2.0 **22 CCHX SW INLET VLVS**: (Elev. 84′ Aux Bldg)

VALVE	NAME	POSITION	IV
22SW122	CCHX SW INLET VLV	Actuator Handwheel Disengaged	
22SW122	43-2 Switch	AUTO	

3.0 **2ADC1AX 125VDC Bus**: (Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
2ADC1AX3	2A VITAL INSTRUMENT BUS INVERTER	ON	
2ADC1AX9	2EP (REG) & 2GP (EMER) PZR HTR BUSES CONTROL POWER	ON	
2ADC1AX11	SPDS 2A 125 VDC BATTERY VOLTAGE	ON	
2ADC1AX13	NO. 2H & 2E 4KV BUSES CONTROL POWER 2H (REG), 2E (EMER)	ON	
2ADC1AX15	2CW 460V BUS CONTROL POWER (REGULAR)	ON	
2ADC1AX17	2A 125VDC BUS CONTROL ROOM GROUND OHMMETER	ON	
2ADC1AX18	2A 125VDC BUS UNDERVOLTAGE RELAY & CONTROL ROOM VOLTMETER	ON	
2ADC1AX19	2AADC 125VDC DISTRIBUTION CABINET (REGULAR)	ON	
2ADC1AX23	2A 125VDC BUS GROUND OHMMETER (BATTERY CHARGER AREA)	ON	
2ADC1AX24	21 EMERGENCY LIGHTING INVERTER (ALTERNATE FEED)	ON	
2ADC1AX25	2ADC 125VDC DISTRIBUTION CABINET (REGULAR)	ON	
2ADC1AX29	NO. 2E & 2G 460V BUSES CONTROL POWER 2E (REG), 2G (EMERG)	ON	
2ADC1AX30	2A 4KV VITAL BUS REGULAR CONTROL POWER	ON	
2ADC1AX35	2A 460V VITAL BUS REGULAR CONTROL POWER	ON	

ATTACHMENT 4
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INDEPENDENT VERIFICATION
BREAKER & VALVE RESTORATION ALIGNMENT

4.0 **2BDC1AX 125VDC Bus**: (Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
2BDC1AX9	2GP (REG) & 2EP (EMER) PZR HTR BUSES CONTROL POWER	OFF	
2BDC1AX13	NO. 2E & 2H 4KV BUSES CONTROL POWER 2E (REG), 2H (EMER)	OFF	
2BDC1AX19	2AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER	OFF	
2BDC1AX25	2ADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER	OFF	
2BDC1AX29	NO. 2G & 2E 460V BUSES CONTROL POWER 2G(REG), 2E(EMER)	OFF	
2BDC1AX30	2A 4KV VITAL BUS EMERGENCY CONTROL POWER	OFF	
2BDC1AX35	2A 460V VITAL BUS EMERGENCY CONTROL POWER	OFF	

5.0 **1BDC1AX 125VDC Bus**: (Unit **1**, Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
1BDC1AX15	2CW 460V BUS EMERGENCY CONTROL POWER	OFF	

6.0 **DC DISTRIBUTION CABINETS MAIN BREAKER ALIGNMENT**:

BREAKER	NAME	POS	IV
2ADC3AXX1	2ADC DISTRIBUTION CABINET REGULAR POWER FROM 2ADC25	ON	
2ADC3AXX2	2ADC DISTRIBUTION CABINET EMERGENCY POWER FROM 2BDC25	OFF	
2ADC2AXX1	2AADC 125VDC DISTRIBUTION CABINET REGULAR POWER FROM 2ADC19	ON	
2ADC2AXX2	2AADC 125VDC DISTRIBUTION CABINET EMERGENCY POWER FROM 2BDC19	OFF	

ATTACHMENT 4
(Page 3 of 5)

INDEPENDENT VERIFICATION
BREAKER & VALVE RESTORATION ALIGNMENT

7.0 **AC BUSES CONTROL POWER BREAKER ALIGNMENT**:

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

(Continued on next page)

ATTACHMENT 4
(Page 4 of 5)

INDEPENDENT VERIFICATION
BREAKER & VALVE RESTORATION ALIGNMENT

7.0 **AC BUSES CONTROL POWER BREAKER ALIGNMENT** (78′ EPA) (continued):

SWITCH	NAME	POS	IV
2EPX	2EPX CONTROL POWER SWITCH	NORMAL 2ADC9	
2GPX	2GPX CONTROL POWER SWITCH	EMERGENCY 2ADC9	
2GPXA	2GPXA CONTROL POWER SWITCH	EMERGENCY 2ADC9	

8.0 **BATTERY DISCONNECT SWITCH ALIGNMENT**:

BREAKER	NAME	POS	IV
2ADC1AX39	2A 125VDC VITAL BATT DISC SWT (located inside, rear 2ADC1AX cabinet)	ON	

9.0 **2ADC1AX 125VDC Bus**: (Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
2ADC1AX13	NO. 2H & 2E 4KV BUSES CONTROL POWER 2H (REG), 2E (EMER)	ON	
2ADC1AX15	2CW 460V BUS CONTROL POWER (REGULAR)	ON	
2ADC1AX30	2A 4KV VITAL BUS REGULAR CONTROL POWER	ON	

10.0 **2BDC1AX 125VDC Bus**: (Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
2BDC1AX13	NO. 2E & 2H 4KV BUSES CONTROL POWER 2E (REG), 2H (EMER)	OFF	
2BDC1AX30	2A 4KV VITAL BUS EMERGENCY CONTROL POWER	OFF	

11.0 **1BDC1AX 125VDC Bus**: (Unit **1**, Elev. 84′ Swgr Room)

BREAKER	NAME	POS	IV
1BDC1AX15	2CW 460V BUS EMERGENCY CONTROL POWER	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
2CWX1CWX1	2CW 460V BUS REGULAR CONTROL POWER FROM 2ADC15 (CWI Structure, 480V Substation, 2CW-460-PTS-S cabinet)	ON	
2CWX1CWX2	2CW 460V BUS EMERGENCY CONTROL POWER FROM 1BDC15 (CWI Structure, 480V Substation, 2CW-460-PTS-S cabinet)	OFF	
2AD1AXX1	2A 4KV VITAL BUS REG CONTROL POWER FROM 2ADC30 (2A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
2AD1AXX2	2A 4KV VITAL BUS EMER CONTROL POWER FROM 2BDC30 (2A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
2AD1AXX3	2A 4KV VITAL BUS REG ALARM POWER FROM 2ADC30 (2A 4KV VITAL BUS 4KV PT's Cubicle rear)	ON	
2AD1AXX4	2A 4KV VITAL BUS EMER ALARM POWER FROM 2BDC30 (2A 4KV VITAL BUS 4KV PT's Cubicle rear)	OFF	
2HD1TBX1	2H 4KV GROUP BUS REG CONTROL POWER FROM 2ADC13 (2H 4KV Group Bus PT Cubicle)	ON	
2HD1TBX2	2H 4KV GROUP BUS EMER CONTROL POWER FROM 2BDC13 (2H 4KV Group Bus PT Cubicle)	OFF	
2ED1TBX1	2E 4KV GROUP BUS REG CONTROL POWER FROM 2BDC13 (2E 4KV Group Bus PT Cubicle)	OFF	
2ED1TBX2	2E 4KV GROUP BUS EMER CONTROL POWER FROM 2ADC13 (2E 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.)

ATTACHMENT 5
(Page 2 of 2)

COMPLETION SIGN-OFF SHEET

2.0 **SIGNATURES**:

Print	Initials	Signature	Date

INDEPENDENT VERIFICATION

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 of this Attachment.

Signature:_____ Date:_____
SM/CRS