

SOUTH CAROLINA ELECTRIC & GAS COMPANY
 VIRGIL C. SUMMER NUCLEAR STATION
 NUCLEAR OPERATIONS

INFORMATION ONLY

FIRE EMERGENCY PROCEDURE

FEP-3.0

TRAIN B PLANT SHUTDOWN TO
 HOT STANDBY DUE TO FIRE

REVISION 2

SAFETY RELATED

Ronald L. Lindler
 DISCIPLINE SUPERVISOR

7-14-95
 DATE

Jerry R. [Signature] for G. Williams
 APPROVAL AUTHORITY

7/17/95
 DATE

RECORD OF CHANGES

| CHANGE LETTER | TYPE CHANGE | APPROVAL DATE | CANCELLATION DATE | CHANGE LETTER | TYPE CHANGE | APPROVAL DATE | CANCELLATION DATE |
|---------------|-------------|---------------|-------------------|---------------|-------------|---------------|-------------------|
| A | P | 7/2/96 | | | | | |
| B | P | 10/22/97 | | | | | |
| | | | | | | | |
| | | | | | | | |

CONTINUOUS USE

Continuous Use of Procedure Required.
 Read Each Step Prior to Performing.

NUCLEAR OPERATIONS

COPY NO. 1

SAP-139
ATTACHMENT IV
PAGE 1 OF 3
REVISION 17

PROCEDURE DEVELOPMENT FORM - A

I. DATE: 8-21-97 PROC. # FEP-30 REV. # 2 CHG. B COMM. # _____
 TITLE: TRAIN B PLANT SHUTDOWN TO HOT STANDBY DUE TO FIRE

NEW PROC _____ CHANGE PERMANENT SAFETY RELATED
 REVISION _____ RESTRICTED _____ FROM _____ TO _____ QUALITY RELATED _____
 NON-SAFETY RELATED _____

II. DESCRIPTION: ¹ Incorporate Power (1:K) for XVG-8133A AND XVG-8133B
² Added closure of PV-2149A, B, C; LCV-459 (460); and PV-8152 to Attachment II step 5.

REASON FOR CHANGE: ¹ ECR-5004 ² Procedure Feedback

Originator: [Signature] Sign/print: STANLEY LAUREN

III. WILL THIS REVISION/CHANGE/NEW PROCEDURE:

| | * YES | NO | N/A |
|---|-------|-------------------------------------|-------|
| 1. Result in significant increased personnel radiation exposure? (ALARA review) | _____ | <input checked="" type="checkbox"/> | _____ |
| 2. Result in a release of effluents to the Environment? | _____ | <input checked="" type="checkbox"/> | _____ |
| 3. Degrade the effectiveness of the Radiation Emergency Plan? | _____ | <input checked="" type="checkbox"/> | _____ |
| 4. Degrade the safeguards effectiveness of the Physical Security, Safeguards Contingency or Training and Qualification Plans? | _____ | <input checked="" type="checkbox"/> | _____ |

* If any question 1 through 4 is answered "YES", refer to appropriate section of procedure for direction.

REQUIRED REVIEW AND COMMENT:

| | | | | |
|--|--------------------------------|------------------------------|--------------------------------|--------------------------------|
| <input checked="" type="checkbox"/> QROB | <input type="checkbox"/> NL&OE | <input type="checkbox"/> CHS | <input type="checkbox"/> GMNPO | <input type="checkbox"/> _____ |
| <input type="checkbox"/> OPS | <input type="checkbox"/> MINTS | <input type="checkbox"/> HPS | <input type="checkbox"/> GMES | <input type="checkbox"/> _____ |
| <input type="checkbox"/> QA | <input type="checkbox"/> NPS | <input type="checkbox"/> SCE | <input type="checkbox"/> GMSSS | <input type="checkbox"/> _____ |
| <input type="checkbox"/> QC | <input type="checkbox"/> TU | <input type="checkbox"/> DE | <input type="checkbox"/> _____ | <input type="checkbox"/> _____ |

REQUESTED REVIEWS:

Red Green [Signature] 9/16/97
 Simon [Signature] Discipline Supervisor Date
 Shenly _____

IV. 10CFR50.59 SCREENING REVIEW/SAFETY EVALUATION

REQUIRED EXEMPT PSRC SUPPORTING DOCUMENT: ECR5004

[Signature] Discipline Supervisor concurrence

V. TEMPORARY APPROVAL:

QUALIFIED REVIEWER _____ DATE _____ QA REVIEW _____ DATE _____
 TELECON BY _____ TELECON BY _____
 SHIFT SUPERVISOR _____ DATE _____ FINAL APPROVAL REQUIRED BY: DATE _____

VI. DISCIPLINE SUPERVISOR FINAL REVIEW:

PSRC REVIEW PRIOR TO IMPLEMENTATION? YES _____ NO

TRAINING REQUIRED? YES _____ NO

IF YES, PRIOR TO PROCEDURE IMPLEMENTATION? YES _____ NO

P/CAP AFFECTED? YES _____ NO

COMMENTS RESOLVED: [Signature] 12/6/97
 Discipline Supervisor Date

TRAINING COMPLETED: NA 10/6/97
 Discipline Supervisor Date

VII. P/CAP ACCEPTABLE?

C. YES NO NL&OE _____ Date _____
 N. YES NO RESP. MGR. _____ Date _____

VIII. FINAL QA REVIEW (As Applicable)

NA
 QA Concurrence _____ Date _____
10/5/97

IX. APPROVAL AUTHORITY:

[Signature] 10/22/97
 Approval/Concurrence Date

X. PSRC REVIEW:

A. REVIEWED BY: PSRC Chairman _____ Date _____
 COMMENTS: YES _____ NO _____

B. PSRC COMMENTS RESOLVED: Responsible Manager _____ Date _____
 PSRC Chairman _____ Date _____

NUCLEAR OPERATIONS

COPY NO. 1

PROCEDURE DEVELOPMENT FORM A

SAP-139
ATTACHMENT IV
PAGE 1 OF 3
REVISION 16
CHANGE F

I. DATE: 4/16/96 PROC. # FEP-3.0 REV. # 2 CHG. A COMM. # _____
TITLE: TRAIN B PLANT SHUTDOWN TO HOT STANDBY DUE TO FIRE

NEW PROC _____ CHANGE PERMANENT SAFETY RELATED
REVISION _____ RESTRICTED _____ FROM _____ TO _____ QUALITY RELATED _____
NON-SAFETY RELATED _____

II. DESCRIPTION: Added step to ensure that the charging pump has cooling water by starting a component cooling pump. Also enhanced step 3.13.c by adding the step attachment that performs the requirement for this step.

REASON FOR CHANGE:

Charging pump must have cooling to protect the pump. Feedback identified this inadequacy. A feedback also identified the need for clarification. *Frith*

Originator

III. WILL THIS REVISION/CHANGE/NEW PROCEDURE:

- | | | | |
|---|-------|-------------------------------------|-------|
| 1. Result in significant increased personnel radiation exposure? (ALARA review) | * YES | NO | N/A |
| 2. Result in a release of effluents to the Environment? | _____ | <input checked="" type="checkbox"/> | _____ |
| 3. Degrade the effectiveness of the Radiation Emergency Plan? | _____ | <input checked="" type="checkbox"/> | X |
| 4. Degrade the safeguards effectiveness of the Physical Security, Safeguards Contingency or Training and Qualification Plans? | _____ | _____ | X |

* If any question 1 through 4 is answered "YES", refer to appropriate section of procedure for direction.

REQUIRED REVIEW AND COMMENT:

- | | | | |
|-------------------------------|--------------------------------|------------------------------|--|
| <input type="checkbox"/> OPS | <input type="checkbox"/> NL&OE | <input type="checkbox"/> CHS | <input type="checkbox"/> GMNPO |
| <input type="checkbox"/> MNTS | <input type="checkbox"/> P&S | <input type="checkbox"/> HPS | <input type="checkbox"/> GMES |
| <input type="checkbox"/> QA | <input type="checkbox"/> NPS | <input type="checkbox"/> MNT | <input type="checkbox"/> GMNSS |
| <input type="checkbox"/> QC | <input type="checkbox"/> TS | <input type="checkbox"/> DE | <input checked="" type="checkbox"/> QR |

Tom Keckesen

J. Lindh 5/30/96
Discipline Supervisor Date

IV. 10CFR50.59 SCREENING REVIEW/SAFETY EVALUATION

REQUIRED EXEMPT PSRC SUPPORTING DOCUMENT: _____

J. Lindh
Discipline Supervisor concurrence

V. TEMPORARY APPROVAL:

QUALIFIED REVIEWER _____ DATE _____
TELECON BY _____
SHIFT SUPERVISOR _____ DATE _____

QA REVIEW _____ DATE _____
TELECON BY _____
FINAL APPROVAL REQUIRED BY: DATE _____

VI. DISCIPLINE SUPERVISOR FINAL REVIEW:

TRAINING REQUIRED? YES _____ NO
IF YES, PRIOR TO PROCEDURE IMPLEMENTATION? YES _____ NO _____
P/CAP AFFECTED? YES _____ NO
COMMENTS RESOLVED *J. Lindh*, 7-1-96
Discipline Supervisor Date

VII. P/CAP ACCEPTABLE?

C. YES _____ NO _____ NL&OE *N/A* Date _____
N. YES _____ NO _____ RESP. MGR. *N/A* Date _____

VIII. FINAL QA REVIEW (As Applicable)

QA Concurrence *N/A* Date _____

IX. APPROVAL AUTHORITY:

Ray E. Williams 7-2-96
Approval/Concurrence Date

X. PSRC REVIEW:

A. REVIEWED BY:

PSRC Chairman _____ Date _____

COMMENTS: YES _____ NO _____

B. PSRC COMMENTS RESOLVED:

Responsible Manager _____ Date _____

PSRC Chairman _____ Date _____

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ATTACHMENTS

| | | |
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| Attachment II | - | Duties of the Nuclear Reactor Operator at the Controls |
| Attachment III | - | Duties of the A Nuclear Reactor Operator |
| Attachment IV | - | Duties of the Intermediate Bldg Operator |
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| Attachment VI | - | Duties of Electrical Maintenance Personnel |
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| Attachment VIII | - | 7.2KV Breaker Operation |
| Attachment IX | - | Operation of Equipment from 480 Volt Motor Control Centers |
| Attachment X | - | Remote Operation of Valves from 480V Motor Control Centers |
| Attachment XI | - | Cross Train Connection of Battery Charger XBC1A-1B |
| Attachment XII | - | Cooldown Data Sheet |
| Attachment XIII | - | Nominal Running Current for Motor Operated Valves |

1.0 PURPOSE

This procedure provides instructions for plant shutdown from the Control Room using Train P equipment for fires in areas other than the Control Room, Cable Spreading Rooms and Relay Room.

2.0 INITIAL CONDITIONS

- 2.1 Smoke or fire alarms on the Integrated Fire System or the Simplex Fire System and verified by personal observation.
- 2.2 RB smoke or fire alarms on the Simplex Fire System and verified by an increase in RB temperature or personal observation.
- 2.3 This procedure is implemented from FEP-1.0.

CAUTION 3.0

In the event of an emergency not covered by an approved written procedure, operating personnel have the authority to take action to minimize personnel injury or damage to the facility and to protect the public health and safety. Such actions shall be documented by the operating personnel.

NOTE 3.0

- a. If any electrical component will not operate from the specified location, attempts should be made to control it per Attachment VII, VIII, IX, or X.
- b. Due to potential for electrical shorts due to fire, each component that is operated remotely should be checked periodically to ensure that it is in the desired position.

3.0 OPERATOR ACTIONS

NOTE 3.1 through 3.6

Steps 3.1 through 3.6 are Immediate Actions.

- 3.1 The Shift Supervisor shall perform the following:
 - a. Direct implementation of this procedure.
 - b. Implement the Emergency Plan, Alert condition per EPP-001, Activation and Implementation of Emergency Plan.
- 3.2 Direct the Control Room Supervisor to implement Attachment I.
- 3.3 Direct the Nuclear Reactor Operator At The Controls to implement Attachment II.
- 3.4 Direct the A Nuclear Reactor Operator to implement Attachment III.
- 3.5 Direct the Intermediate Building Operator to implement Attachment IV.
- 3.6 Direct the Auxiliary Building Operator Upper to implement Attachment V.

NOTE 3.7 through 3.11

Steps 3.7 through 3.11 must be completed within 30 minutes of implementation of this procedure.

- 3.7 Direct Electrical Maintenance personnel to implement Attachment VI.

NOTE 3.8

- a. Steam Generator C and its associated instrumentation must be relied upon for Train B Shutdown. Steam Generators A and B can be used for cooldown, however, primary reliance should be placed on PCV-2020, C SD/PWR RELIEF, and PI-2020, MS LINE C PRESS.
- b. Any Steamline Power Relief Valve which fails to operate from the Main Control Board may be operated locally.

- 3.8 Maintain Steam Generator pressure between 1000 psig and 1100 psig by throttling the following:

- a. PCV-2000, A SD/PWR RELIEF, from the Main Control Board or AB-436 W. Pen.
- b. PCV-2010, B SD/PWR RELIEF, from the Main Control Board or IB-436 E. Pen.
- c. PCV-2020, C SD/PWR RELIEF, from the Main Control Board or IB-436 E. Pen.

NOTE 3.9

If Natural Circulation is not indicated, increased dumping of steam should restore Natural Circulation.

- 3.9 Verify Natural Circulation as follows:

- a. RCS subcooling greater than 30°F as determined by the following:
 - 1) PI-402, RCS WR PRESS.
 - 2) TR-413, HOT LEG °F WIDE RNG, LOOP C (BLUE PEN).
 - 3) Steam Tables.

- b. Steam Generator pressure stable or decreasing as indicated on the following:
 - 1) PI-495, SG C NR PRESS.
 - 2) PI-2020, MS LINE C PRESS.
- c. Reactor Coolant System T_H stable or decreasing as indicated on TR-413, HOT LEG °F WIDE RNG, LOOP C (Blue Pen).
- d. Reactor Coolant System T_C at saturation temperature for Steam Generator pressure as determined by the following:
 - 1) TR-410, COLD LEG °F WIDE RNG, LOOP C (Blue Pen).
 - 2) PI-495, SG C NR PRESS.

NOTE 3.10

Primary reliance should be placed on FCV-3551, MD EFP TO SG C, and LI-496, SG C NR LEVEL.

- 3.10 Maintain Steam Generator level between 55% and 65% Narrow Range by throttling the following valves:
 - a. FCV-3531, MD EFP TO SG A.
 - b. FCV-3541, MD EFP TO SG B.
 - c. FCV-3551, MD EFP TO SG C.
- 3.11 Verify Reactor Coolant System pressure is greater than 200 psig on PI-402, RCS WR PRESS, and place both RHR pumps in PULL TO LK NON-A.

CHG A

NOTE 3.12 through 3.14

Steps 3.12 through 3.14 must be completed within 90 minutes of implementation of this procedure.

- 3.12 Ensure proper Seal Injection operation as follows:
 - a. Verify XPP-0043B, PUMP B, or XPP-0043C, PUMP C TRAIN B, is running.
 - b. Close MVT-8100, SEAL WTR RTN ISOL.
 - c. Verify AB upper has reported Seal Injection lined up per Attachment V, Step 6.

CHG A

- 3.13 Maintain Pressurizer level between 25% and 50% as follows:
- a. Throttle XVT08389-CS, SEAL INJECTION HEADER FLOW BYPASS VALVE (AB-436 Filter gallery).
 - b. Monitor level on LI-461, PZR LEVEL.
 - c. Monitor RWST level on ILI00990A-SF, RWST REMOTE LEVEL INDICATOR (AB-388).
 - d. If additional charging flow is needed, perform either of the following:
 - 1) Restore normal charging.
 - 2) Open MVG-8801B, HI HEAD TO COLD LEG INJ, from the Main Control Board or FH-412.
- 3.14 Maintain RCS subcooling as determined by PI-402, RCS WR PRESS, and TR-413, HOT LEG °F WIDE RNG, LOOP C (Blue Pen) greater than 30°F as follows:
- a. Establish a cooldown rate less than 50°F per hour.

NOTE 3.14.b

If Pressurizer heaters are not available, charging and letdown flows should be controlled to maintain stable RCS pressure.

- b. Maintain Reactor Coolant System pressure between 2200 psig to 2300 psig by cycling the GRP II backup heaters as necessary.
- c. Log temperature on Attachment XII at least once per 30 minutes.

NOTE 3.15

Step 3.15 should be completed within 120 minutes of implementation of this procedure.

- 3.15 Establish Reactor Building Cooling as follows:
- a. Open MVG-3108C, RBCU 64B INLET ISOL.
 - b. Open MVG-3108D, RBCU 65B INLET ISOL.
 - c. Open MVG-3109C, RBCU 64B OUTLET ISOL.
 - d. Open MVG-3109D, RBCU 65B OUTLET ISOL.
 - e. Verify the AB upper has reported Service Water lined up for Reactor Building cooling.

- f. Start XPP-0045B, PUMP B.
- g. Start XFN 0064B-AH, RBCU 1B SLOW.
- h. Start XFN 0065B-AH, RBCU 2B SLOW.

NOTE 3.16 through 3.21

The following steps are not required for safe shutdown and may be impossible for some fire locations. The transition to FEP-3.1 may be made at any time. If manpower is available and the decision has been made to stay in hot standby, the following steps should be performed.

- 3.16 Verify the Turbine Driven Emergency Feed Pump is operable.
- 3.17 Establish Component Cooling flow as follows:
 - a. Close the following valves:
 - 1) XVB09503B-CC, RH HEAT EXCHANGER B CC INLET VALVE (AB-412).
 - 2) XVB09524A-CC, NON-ESS EQUIP SUPPLY HDR XCONN VALVE (AB-412).
 - 3) XVB09525A-CC, NON-ESS EQUIP SUPPLY HDR XCONN VALVE (AB-412).
 - 4) XVB09687A-CC, NON-ESS EQUIP CC RETURN HDR XCONN VLV (IB-436).
 - 5) XVB09526A-CC, NON-ESS EQUIP CC RETURN HDR XCONN VLV (IB-436).
 - b. Open the following valves:
 - 1) XVB09524B-CC, NON-ESS EQUIP SUPPLY HDR XCONN VALVE (AB-412).
 - 2) XVB09525B-CC, NON-ESS EQUIP SUPPLY HDR XCONN VALVE (AB-412).
 - 3) XVG09625-CC, RB CC INLET HEADER ISOLATION VALVE (AB-412).
 - 4) XVG09626-CC, RB CC INLET HEADER ISOLATION VALVE (AB-412).
 - 5) XVG09568-CC, EXCESS LTDN HX INLET CC HEADER ISOL VLV (AB-436 W.Pen.).
 - 6) XVG09606-CC, RB CC RETURN HEADER VALVE (AB-436 W. Pen.).

- 7) XVB09526B-CC, NON-ESS EQUIP CC RETURN HDR XCONN VLV (IB-412).
 - 8) XVB09687B-CC, NON-ESS EQUIP CC RETURN HDR XCONN VLV (IB-412).
 - 9) XVG09600-CC, RB CC SUPPLY HEADER ISOLATION VALVE (IB-436 E. Pen.).
- 3.18 Ensure proper Chilled Water system operation as follows:
- a. Verify XPP-48B, PUMP B, or XPP-48C, PUMP C TRAIN B, is running (HVAC).
 - b. Verify XHX-1B, CHILLER 1B, or XHX-1C, CHILLER C TRAIN B, is running (HVAC).
 - c. Verify the IB operator has reported Chilled Water System lined up.
- 3.19 Establish Instrument Air as follows:
- a. Start XAC-12-IA, SUPP INST AIR COMPRESSOR.
 - b. If necessary, close XSW1DB1 08B, SUPPLEMENTAL INSTR AIR COMPR XAC0012A-IA, per Attachment VII.
 - c. Open the following valves:
 - 1) PVA-2659, INST AIR TO RB AIR SERV.
 - 2) PVT-2660, AIR SPLY TO RB.
 - d. If either of the following valves will not operate from the Main Control Board, install a jumper around the solenoid to open the valve:
 - 1) XVA02659-IA, RB INSTRUMENT AIR BACK-UP SUP ISOL VLV (AB-436 W. Pen.).
 - 2) XVT02660-IA, RB INSTRUMENT AIR SUPPLY ISOL VLV (ORC) (AB-436 W. Pen.).
- 3.20 Establish normal Letdown to control Pressurizer level as follows:
- a. Open ITV00144-CC, LETDOWN HX CC OUTLET CONTROL VALVE, by isolating and venting Instrument Air to the valve (AB-412).
 - b. Open XVT-8152, LTDN ISOL, at the CREP B panel (IB-436).
 - c. If XVT-8152 will not open, install jumpers around the solenoid to open it (AB-412 W. Pen.).
 - d. Close XVG08408A-CS, LTDN HDR PRESS CONT VLV INLET ISOL VLV (AB-424).

- e. Throttle open XVT08409-CS, LTDN HDR PRESS CONT VLV BYPASS VALVE, three turns (AB-424).
 - f. Open the following valves:
 - 1) LCV-459, LTDN LINE ISOL.
 - 2) LCV-460, LTDN LINE ISOL.
 - 3) PVT-8149A, LTDN ORIFICE A ISOL.
 - g. If LCV-459, LCV-460, or PVT-8149A will not open from the Main Control Board, open them from the CREP or install jumpers around the solenoid to open (RB-412).
 - h. Cycle PVT-8149A, LTDN ORIFICE A ISOL, as necessary to maintain Pressurizer level between 25% and 50%.
 - i. Isolate and vent air from the following valves:
 - 1) LCV00115A-CS, VOLUME CONTROL TANK LEVEL CONTROL (AB-436 Filter Gallery).
 - 2) TCV00143-CS, DEMIN INLET TEMP DIVERSION VALVE (AB-436 Demin Valve Gallery).
 - 3) XVT08541-CS, MODERATING HEAT EXCHANGER BYPASS VALVE (AB-436).
- 3.21 If offsite power has been lost, perform the following:

NOTE 3.21.a

Some breakers, like the Circulating Water Pump breakers, may have to be opened locally from their respective switchgear.

- a. Open all 7.2 KV breakers on the following busses:
 - 1) XSW1A, BUS 1A.
 - 2) XSW1B, BUS 1B.
 - 3) XSW1C, BUS 1C.
- b. Open all 480V feed breakers on the Main Control Board for BUS 1A, BUS 1B, and BUS 1C.
- c. If offsite power is available, verify OCB 8902, MAIN XFMR FEED, is closed.

- d. Close the following breakers:
 - 1) BUS 1A NORM FEED.
 - 2) BUS 1B NORM FEED.
 - 3) BUS 1C NORM FEED.
 - e. Energize selected busses and loads at the discretion of the Shift Supervisor.
- 3.22 Proceed to FEP-3.1, Train B Shutdown From Hot Standby To Cold Shutdown Due To Fire.

4.0 FINAL CONDITIONS

- 4.1 Reactor conditions are as follows:
 - a. All Rods are inserted.
 - b. Reactor is subcritical.
 - c. Shutdown Margin is satisfied.
- 4.2 Reactor Coolant System conditions are as follows:
 - a. Seal Injection is established.
 - b. Natural Circulation is established.
 - c. RCS subcooling is greater than 30°F.
- 4.3 Plant systems in service are as follows:
 - a. Diesel Generator B is supplying XSW1DB loads.
 - b. Train B CVCS is supplying Reactor Coolant Pump seals.
 - c. Steam Dumps or one or more PORVs are supplying secondary heat removal.
 - d. Train B Service Water System is running.
 - e. Train B HVAC Chilled Water System is running.
 - f. Train B Reactor Building Cooling System is in service.
 - g. Train B Emergency Feedwater is in service.
 - h. Train B Component Cooling System is in service.

- 4.4 Additional plant systems that may be in service are as follows:
- a. BOP electrical busses may be energized.
 - b. Backup Instrument Air may be supplying the Instrument Air system.
 - c. CVCS Letdown may be controlling pressurizer level between 25% and 50%.
 - d. Pressurizer heaters is controlling Pressurizer pressure between 2200 psig and 2300 psig.

5.0 REVISION SUMMARY

- 5.1 Incorporated changes A and B.
- 5.2 Updated the procedure to include the new format.
- 5.3 Deleted references to valves no longer in the plant.

DUTIES OF THE CONTROL ROOM SUPERVISOR

NOTE 1 through 4

Steps 1 and 2 are Immediate Actions. Steps 3 and 4 must be completed within 30 minutes.

1. Verify proper response when the Reactor and Turbine are tripped.
2. Verify Pressurizer level and pressure are recovering as indicated on the following:
 - a. PI-402, RCS WR PRESS.
 - b. LI-461, PZR LEVEL.
3. Evaluate the plant page and radio systems for communication.
4. After 15 minutes, dispatch the Shift Engineer to the IB-436 CREP panel to energize N-33 detector high voltage and verify that Reactor power is decreasing or stable in the source range.

DUTIES OF THE NUCLEAR REACTOR OPERATOR
AT THE CONTROLS

NOTE 1 through 5

Steps 1 through 5 are Immediate Actions.

1. Trip the Reactor manually from the Main Control Board and ensure the following:
 - a. Reactor Trip and Bypass Breakers are open.
 - b. All rod bottom lights are lit.
 - c. Reactor power level is decreasing.
2. If the Reactor did not trip, direct the IB Operator to trip the Reactor locally.
3. Ensure the Turbine trips as follows:
 - a. Turbine MAIN STOP VLVS are closed.
 - b. Generator trips after a 30 second delay.
 - c. Trip the EXC FIELD BKR.
4. Trip all Reactor Coolant Pumps.
5. Close the following valves:
 - a. PVM-2801A(B)(C), A(B)(C) ISOL (Main Steam).
 - b. PVM-2869A(B)(C), A(B)(C) BYP VLV (Main Steam Bypass).
 - c. PVG-503A(B)(C), A(B)(C) ISOL (Steam Generator Blowdown).
 - d. MVG-8000A(B)(C), RELIEF 445A(444B)(445B) ISOL.
 - e. PVT-8149(A)(B)(C), LTDN ORIFICE (A)(B)(C) ISOL.
 - f. LCV-459(460), LTDN LINE ISOL.
 - g. PVT-8152, LTDN LINE ISOL.
 - h. PVT-8153(8154), XS LTDN ISOL.
 - i. MVG-8108, CHG LINE ISOL.

CHG
B

6. Disable the Reactor Building Spray System as follows:
 - a. Place XPP-0038A, PUMP A, in PULL TO LK NON-A.
 - b. Place XPP-0038B, PUMP B, in PULL TO LK NON-A.
 - c. Close MVG-3001A, RWST TO SPRAY PUMP A SUCT.
 - d. Close MVG-3001B, RWST TO SPRAY PUMP B SUCT.
7. Verify EUS 1B3-1DB1 TIE BKR is open within 30 minutes.
8. Reduce Reactor Coolant Pump seal leakoff within 90 minutes by closing MVT-8100, SEAL WTR RTN ISOL, from the Main Control Board or AB-412 W. Pen.

DUTIES OF THE A NUCLEAR REACTOR OPERATOR

NOTE 1 and 2

Steps 1 and 2 are Immediate Actions. All other steps must be completed within 30 minutes.

1. Select PWR RLF and close the following valves:
 - a. PCV-2000, A SD/PWR RELIEF.
 - b. PCV-2010, B SD/PWR RELIEF.
 - c. PCV-2020, C SD/PWR RELIEF.
2. De-energize the following by opening their respective Disconnect Switches located inside the Main Control Board:
 - a. Sub Panel-19A (XCP-6112).

| <u>Switch</u> | <u>Valve Number</u> |
|---------------|---------------------|
| 1) DS-32 | IPV-445A |
| 2) DS-33 | IPV-445B |
 - b. Sub Panel-19B (XCP-6113).

| <u>Switch</u> | <u>Valve Number</u> |
|---------------|---------------------|
| 1) DS-31 | IPV-444B |
| 2) DS-13 | XVT-8145 |
3. Ensure proper Component Cooling Water System operation as follows:
 - a. Start XPP-001B-CC, PUMP B, or XPP-0001C-CC, PUMP C TRAIN B.
 - b. Verify Component Cooling Pump B(C) discharge pressure is between 60 psig and 70 psig (IB-412).
4. Establish Train B Charging using Charging Pump B(C) as follows:
 - a. Open LCV-115B, RWST TO CHG PP SUCT.
 - b. Open LCV-115D, RWST TO CHG PP SUCT.
 - c. Open MVT-8109B(C), CHG PP B(C) (Miniflow Isolation).
 - d. Ensure MVG-8106, CHG PP (Miniflow Isolation), is open.

CHG
A

CHG
B

- e. Open MVG-8131A, LP B SUCT TO CHG PP C.
 - f. Open MVG-8131B, LP B SUCT TO CHG PP C.
 - g. Start XPP-0043B, PUMP B, or XPP-0043C, PUMP C TRAIN B.
 - h. Close LCV-115E, VCT OUTLET ISOL.
5. On XCP-6040, FIRE AND SECURITY panel, select POWER SELECT to BUS B.
6. Establish power to XSW 1DB from Diesel Generator B as follows:
- a. Start Diesel Generator B by depressing the EMERG START pushbutton.
 - b. Verify normal voltage and frequency indications.
 - c. Verify BUS 1DB ALT FEED breaker is open.
 - d. Open BUS 1DB NORM FEED breaker.
 - e. Verify BUS 1DB DG FEED breaker is closed.
7. Remove power from XSW 1DA as follows:
- a. Verify that BUS 1DA DG FEED breaker is open.
 - b. Verify the IB Operator has reported Diesel Generator A is disabled.
 - c. Open BUS 1DA NORM FEED breaker.
 - d. Open BUS 1DA ALT FEED breaker.
8. Ensure the following Train B loads start:
- a. Charging Pump.
 - b. RHR Pump.
 - c. Service Water Pump.
 - d. Component Cooling Pump.
 - e. Motor Driven Emergency Feedwater Pump.
 - f. RBCU 64B or 65B (slow speed).
 - g. Service Water Booster Pump.
 - h. HVAC Chilled Water Pump.
 - i. HVAC Chiller.
 - j. Fuel Handling Building Exhaust Fan.

- k. XFN-32B, SPLY FAN B (Control Room).
 - l. XFN-36B, RELAY RM CLG FAN B.
 - m. XFN-38B/XFN-39B, SPLY & EXH FANS (Battery Charger Room).
 - n. XFN-76, ESF SWGR 1DB RM CLG FAN.
 - o. XFN-80B, VENT FAN B (Service Water Pump House).
 - p. XFN-106B, SPD SW/EVAC CLG FAN B.
 - q. XFN-81B, SWBP CLG FAN B.
 - r. XFN-133, AB MCC RM B.
9. Ensure the following ventilation is aligned as specified (HVAC Board):
- a. XFN-46B, CHG PUMP B CLG FAN, is running.
 - b. XFN-47, CHG PUMP C CLG FAN, is running if Charging Pump C is the Train B pump.
 - c. XDP-113B, Relay Room Recirc Damper is open.

DUTIES OF THE INTERMEDIATE BLDG OPERATOR

NOTE 1

Step 1 is an Immediate Action.

1. If directed by the Nuclear Reactor Operator at the Controls, trip the Reactor locally at XSW0001-CR by opening the following (IB-463):
 - a. XSW0001-RT-A, REACTOR TRIP BREAKER A.
 - b. XSW0001-RT-B, REACTOR TRIP BREAKER B.
 - c. XSW0001-BY-A, REACTOR TRIP BYPASS BREAKER A.
 - d. XSW0001-BY-B, REACTOR TRIP BYPASS BREAKER B.
2. Obtain plant keys, tool bag, and flashlight from the IB-436.
3. Disable the Diesel Generator A as follows within 30 minutes:
 - a. Verify XSW1DA 03, EMERG DIESEL GEN A XEG0001A-DG, breaker is open (IB-463).
 - b. Open the D.C. breakers RRT and RRP inside XSW1DA 03 (IB-463).
 - c. Place the LOCAL/REMOTE/MAINT switch for Diesel Generator A in MAINT (DB-436).
 - d. Report to the A Nuclear Reactor Operator that Diesel Generator A is disabled.
4. Ensure proper Service Water Pump House ventilation damper positions by isolating Instrument Air to the Service Water Pump House within 90 minutes as follows:
 - a. Close XVA12969-SA, SW PUMP HOUSE INST AIR HDR SUPPLY VALVE (SW-440).
 - b. Open XVT22923-SA, SW SA SUPPLY HEADER LOW POINT DRAIN VLV (SW-440), to depressurize the header.
5. Insure proper Chill Water System operation within 90 minutes as follows:
 - a. Open XVB03126B-SW, HVAC CHILLER CONDENSER B SW SUPPLY VLV (IB-412).
 - b. Open XVB03128C-SW, HVAC CHILL COND C SW HDR B IN ISOL VLV (IB-412), if C Chiller is running.
 - c. Report to the Control Room that the Chilled Water System is lined up.

DUTIES OF THE AUXILIARY BLDG OPERATOR (UPPER)

NOTE 1

Step 1 is an Immediate Action.

1. Secure any radioactive liquid or gaseous releases by closing PVD-6910, LIQUID EFFLUENTS TO FAIRFIELD PENSTOCKS, and HCV-14, WASTE GAS DISCHARGE CONTROL VALVE.
2. Obtain plant keys, tool bag, flashlight, and a copy of Attachment XI of this procedure from the Turnover Station, AB-412.
3. Align the 1A-1B Battery Charger per Attachment XI (IB-412) within 30 minutes.
4. Verify the Control Room has disabled the Reactor Building Spray Pumps, then close the following valves within 30 minutes:
 - a. XVG03001A-SP, RB SPRAY PP A RWST SUCTION HDR VALVE (AB-397).
 - b. XVG03001B-SP, RB SPRAY PP B RWST SUCTION HDR VALVE (AB-397).
5. Close the following valves within 90 minutes:
 - a. XVG08812A-SI, RH PUMP A SUCTION HEADER VALVE (AB-397).
 - b. XVG08812B-SI, RH PUMP B SUCTION HEADER VALVE (AB-397).
6. Verify seal injection lineup within 90 minutes as follows:
 - a. Open XVT08109B-CS, CHARGING/SI PUMP B MINI FLOW ISOL VALVE (AB-388).
 - b. Open XVT08109C-CS, CHARGING/SI PUMP C MINI FLOW ISOL VALVE (AB-388).
 - c. Open LCV00115D-CS, CHG PUMP B SUCTION HDR RWST ISOL VLV (AB-400).
 - d. Open XVG08131A-CS, CHG PUMPS B TO C SUCT XCONN VALVE (AB-400).
 - e. Open XVG08131B-CS, CHG PUMPS B TO C SUCT XCONN VALVE (AB-400).
 - f. Open XVG08132A-CS, CHG PUMPS A TO C DISCH XCONN VALVE (AB-400).
 - g. Open XVG08132B-CS, CHG PUMPS A TO C DISCH XCONN VALVE (AB-400).
 - h. Open XVG08133B-CS, CHG PUMPS B TO C DISCH XCONN VALVE (AB-400).

- i. Open XVG08133A-CS, CHG PUMPS B TO C DISCH XCONN VALVE (AB-400).
 - j. Open XVG08106-CS, CHARGING PUMPS MINI FLOW HDR ISOL VALVE (AB-424).
 - k. Close LCV00115E-CS, VOLUME CONTROL TANK OUTLET HDR ISOL VLV (AB-424).
 - l. Close XVG08706B-RH, CHG/SI PUMP SUCT HDR RH HDR B INLET VLV (AB-412, B RHR HX ROOM).
 - m. Open XVT08102A-CS, RC PUMP A SEAL SUPPLY ISOL VALVE (ORC) (AB-412 W. Pen.).
 - n. Close XVG08107-CS, CHARGING PUMPS DISCHARGE HDR ISOL VALVE (AB-412 W. Pen.).
 - o. Close XVG08801A-SI, HI HEAD INJ VALVE (FH-412).
 - p. Close XVG08801B-SI, HI HEAD INJ VALVE (FH-412).
 - q. Open XVT08102B-CS, RC PUMP B SEAL SUPPLY ISOL VALVE (ORC) (AB-412 E. Pen.).
 - r. Open XVT08102C-CS, RC PUMP C SEAL SUPPLY ISOL VALVE (ORC) (AB-412 E. Pen.).
 - s. Open XVT08389-CS, SEAL INJECTION HEADER FLOW BYPASS VALVE (AB-436, Filter Gallery).
 - t. Close XVT08105-CS, SEAL INJECTION HEADER ISOLATION VALVE (AB-436, Filter Gallery).
 - u. Report to the Control Room that seal injection is lined up.
7. Align Service Water for Reactor Building Cooling within 120 minutes as follows:
- a. Open XVB03106B-SW, SW BOOSTER PUMP B DISCHARGE VALVE (FH-463).
 - b. Open XVG03107B-SW, SW POND RBCU 1B&2B RETURN ISOLATION VLV (FH-463).
 - c. Open XVG03103B-SW, RBCU 1B&2B RETURN HEADER ISOLATION VLV (FH-463).
 - d. Verify IPI04540, SW BOOSTER PUMP B SUCTION PRESSURE IND (IB-412), indicates greater than 20 psig.
 - e. Notify the Control Room that Service Water is lined up for Reactor Building cooling.

DUTIES OF ELECTRICAL MAINTENANCE PERSONNEL

NOTE 1 through 4

Steps 1 through 4 must be completed within 30 minutes.

1. Report to the Control Room and obtain radio, tool bag and keys.
2. Align XET-4006, Security System transfer switch (IB-436, CCW Speed Switch B Room) to Train B as follows:
 - a. Locate the terminal board above the components mounted on the cabinet door.
 - b. On terminal 3 - cut the top black wire.
 - c. On terminal 4 - cut the top black wire.
 - d. On terminal 11 - cut the top black wire.
 - e. Ensure the letter E is showing on the switch position indicator, located on the back wall of the cabinet.
 - f. If the letter N is showing, then momentarily jumper from terminal 4 to terminal 11 and verify the indicator shifts to E.
3. Verify that Operations has completed sequencing loads on to Diesel Generator B.

NOTE 4 and 5

- a. Maintenance personnel should stand by at the areas directed by Steps 4 and 5 but should not perform the steps until the loads are sequenced on to Diesel Generator B.
 - b. Individuals may mark each cubicle in whatever manner chosen to keep track of breakers opened.
4. Open the following indicated (non-shaded) breakers on XMC1DB2X(IB-463).

436' IB

MCC-XMC1DB2X

| | | | | |
|--|--|--|---|---|
| | <u>XMC1DB2X 02AD</u> RCP B SEAL INJECTION ISO ORC XVT8102B-CS | <u>XMC1DB2X 03AD</u> SER WTR TO EF PUMP B SUCTION XVG1001B-EF | <u>XMC1DB2X 04AD</u> CHEM FEED TO EF HDR B ISO XVK1633B-FW | |
| <u>XMC1DB2X 01DG</u> COMP COOLING WTR ISO NON-ESS EQUIPMENT XVB9526B-CC | | | | |
| | <u>XMC1DB2X 02EH</u> RCP C SEAL INJECTION ISO ORC XVT8102C-CS | <u>XMC1DB2X 03EH</u> SER WTR TO TURB DRVN EF PUMP SUCTION XVG1002-EF | <u>XMC1DB2X 04EH</u> SW INLET TO HVAC CHILLER B XVB3126B-SW | <u>XMC1DB2X 05EH</u> B TRAIN SW INLET TO HVAC CHILLER C XVB3128C-SW |
| <u>XMC1DB2X 01HK</u> COMP COOLING WTR ISO NON-ESS EQUIPMENT XVB9687A-CC | | | | |
| | | <u>XMC1DB2X 03KM</u> RADIATION MONITORING CONT RM SUPPLY AIR PUMP IRMA001-RM | | |

436' IB

MCC-XMC1DB2X

| | | | |
|---|---|---|--|
| <p>XMC1DB2X 06ABL POST ACCIDENT ANLZR SYS XPN7215B-HR</p> | <p><u>XMC1DB2X 07AD</u> CRDM CLG WTR OUTLET VLV XVG7504-AC</p> | <p><u>XMC1DB2X 08AC</u> OUTDOOR LTG ESS PNL B APN8054B-EM</p> | <p><u>XMC1DB2X 09CD</u> POWER LOCKOUT FOR XVG8886-88B-5I</p> |
| | <p><u>XMC1DB2X 07EH</u> VLV SERV WTR LOOP B ISOLATION XVG1037B-EF</p> | <p><u>XMC1DB2X 08DH</u> PRESSURIZER PRESS RELIEF ISO XVG8000C-RC</p> | |
| | <p><u>XMC1DB2X 07IM</u> CRDM CLG WTR INLET VLV XVG7502-AC</p> | <p><u>XMC1DB2X 08IM</u> MAIN STEAM TO EFWPT DRAIN STOP VALVE XVT2813-MS</p> | |

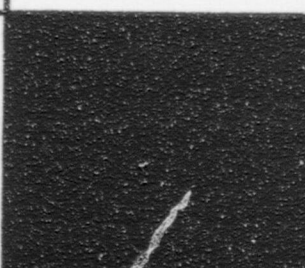

5. Open the following indicated (non-shaded) breakers on XMC1DB2Y(AB-463).

463' AB

| MCC-XMC1DB2Y | | | | |
|--|--|--|---|---|
| | <u>XMC1DB2Y 02AD</u> RWST TO RB SPRAY PUMP B SUCTION XVG3001B-SP | <u>XMC1DB2Y 03AD</u> RHR TO CHARGING PUMP VALVE XVG8706B-RH | <u>XMC1DB2Y 04AE</u> RHR INLET FROM LOOP A XVG8702A-RH | |
| <u>XMC1DB2Y 01EH</u> RB SPRAY HDR B LOOP ISOL ORC XVG3003B-SP | <u>XMC1DB2Y 02EH</u> NAOH TK TO RB SPRAY PP B SUCTION XVG3002B-SP | <u>XMC1DB2Y 03EH</u> RHR PUMP B MINIFLOW FCV-602B XVT0602B-RH | <u>XMC1DB2Y 04FJ</u> RHR INLET FROM LOOP C XVG8702B-RH | <u>XMC1DB2Y 05EH</u> EMERG FEEDWATER PUMP MAIN STEAM BLOCK XVG2802B-MS |
| <u>XMC1DB2Y 01IJL</u> NAOH SPRAY HEAT TRACE CONTR PNL B XPN2010-ET | <u>XMC1DB2Y 02IM</u> RB SUMP ISOL IRC XVG3004B-SP | <u>XMC1DB2Y 03IM</u> PRESSURIZER PRESSURE RELIEF ISOL XVG8000A-RC | | |
| <u>XMC1DB2Y 01KL</u> IRMA011-RM RADIATION MONITORING AUX BUILDING VENTS | | | | |

463' AB

MCC-XMC1DB2Y

| | | | | |
|---|--|--|--|--|
| <p><u>XMC1DB2Y 06AD</u> CHARGING PUMP DISCHARGE HEADER ISOLATION VALVE XVG8132B-CS</p> | <p><u>XMC1DB2Y 07AD</u> CHG PUMP C MINIFLOW ISOL XVT8109C-CS</p> | <p><u>XMC1DB2Y 08AD</u> RCS CHARGING LINE VALVE XVG8108-CS</p> | <p><u>XMC1DB2Y 09AD</u> SEAL WTR RETURN HDR ISOL ORC XVT8100-CS</p> | <p><u>XMC1DB2Y 10AD</u> NON ESSENTIAL LOOP TO COMP CLG BSTR PUMP ISOL XVG9626-CC</p> |
| <p><u>XMC1DB2Y 06EH</u> CHG PUMPS B & C DISCHG HDR CROSSOVER VALVE XVG8133B-CS</p> | <p><u>XMC1DB2Y 07EH</u> CHG PUMP SUCTION HDR ISOL XVG8130B-CS</p> | <p><u>XMC1DB2Y 08EH</u> CHARGING PUMP A MINIFLOW ISOL XVT8109A-CS</p> | <p><u>XMC1DB2Y 09EH</u> B.A.T. TO CHARGING PUMP SUCTION PUMP XVT8104-CS</p> |  |
| <p><u>XMC1DB2Y 06IL</u> VLV RCP A SEAL INJECTION ISOLATION XVT8102A-CS</p> | <p><u>XMC1DB2Y 07IL</u> CHG PUMP SUCTION HDR ISOL XVG8131B-CS</p> | <p><u>XMC1DB2Y 08IL</u> CHG PUMP B MINIFLOW ISOL XVT8109B-CS</p> | <p><u>XMC1DB2Y 09IL</u> SEAL WATER INJECT VALVE XVT8105-CS</p> | <p><u>XMC1DB2Y 10JM</u> VCT TO CHARGING PUMP ISOLATION VALVE LCV-115E XVG0115E-CS</p> |
|  | | | | |

463' AB

MCC-XMC1DB2Y

| | | |
|--|---|---|
| <p><u>XMC1DB2Y 11AD</u> COMP COOLING WTR TO NON-ESS EQUIP LOOP B XVB9524B-CC</p> | <p><u>XMC1DB2Y 12AD</u> CC INLET TO RHR HY EXCH B XVB9503B-CC</p> | <p><u>XMC1DB2Y 13BD</u> CONTROLLED ACCESS EXH FAN B XFN0028B-AH</p> |
| <p><u>XMC1DB2Y 11EH</u> COMP COOLING WTR TO NON-ESS EQUIP LOOP A XVB9525A-CC</p> | <p><u>XMC1DB2Y 12EF</u> COMPUTER RM SUPPLY FAN B UNIT 1 XFN0041B-AH</p> | |
| <p><u>XMC1DB2Y 11IL</u> COMP COOLING WTR RTN FROM RB ORC XVG9606-CC</p> | <p><u>XMC1DB2Y 12IM</u> RX HEAD VENT VV TO PZR RLF TK XVT8096B</p> | <p><u>XMC1DB2Y 13JM</u> RB SUMP ISOL ORC XVG3005B-SP</p> |

463' AB

MCC-XMC1DB2Y

| | | | | | |
|--|---|--|---|---|--|
| <p><u>XMC1DB2Y 19AD</u> VLV BLDG SERV INLET B ISOLATION XVB3110B-SW</p> | | | | <p><u>XMC1DB2Y 22ABL</u> RW STOR TANK HEAT TRACE CONTROL PNL B XPN2006-ET</p> | <p><u>XMC1DB2Y 23AD</u> FS TO RB CHARCOAL CLEANUP SYS 4A-4B ORC XVG6797-FS</p> |
| <p><u>XMC1DB2Y 19EH</u> VLV BLDG SERV OUTLET B ISOL XVG3111B-SW</p> | <p><u>XMC1DB2Y 20EH</u> VLV BLDG SERV OUTLET A ISOLATION XVG3112A-SW</p> | <p><u>XMC1DB2Y 21EH</u> RWST TO CHARGING PUMP VALVE LCV-115D XVG0115D-CS LCV-115D</p> | <p><u>XMC1DB2Y 22CG</u> RECIRC SUMP TO RHR PUMP B ISOL VALVE B XVG8811B-SI</p> | <p><u>XMC1DB2Y 23FJ</u> REACTOR HEAD VENT VLV TO PRESSURIZER RELIEF TANK XVT8095B-RC</p> | |
| <p><u>XMC1DB2Y 19IM</u> VLV REAC BLDG RECIRC UNIT D ISOLATION XVG3108D-SW</p> | <p><u>XMC1DB2Y 20IM</u> VLV REAC BLDG RECIRC UNIT C ISOLATION XVG3109C-SW</p> | <p><u>XMC1DB2Y 21IM</u> VLV REAC BLDG RECIRC UNIT D ISOLATION XVG3109D-SW</p> | <p><u>XMC1DB2Y 22IM</u> VLV ISOL REAC BLDG INLET B XVB3106B-SW</p> | | |

463'AB

MCC-XMC1DB2Y

XMC1DB2Y 24AB

(XTF 5930-EM)
XFMR FOR BACK-UP
MET TOWER A.C
DIST PANEL
APN5930

XMC1DB2Y 24CD

CONTROL ROOM
NORMAL SUPPLY FAN B
XFN0032B-AH

XMC1DB2Y
24EFL

MU WTR STG
TK HEAT TRACE
CONTR PNL B
XPN2008-ET

XMC1DB2Y 25IJ

CONTROLLED ACCESS LAB
HOOD EXH FAN B
XFN0087B-AH

6. Contact the Control Room when Step 5 is completed.

480V BREAKER OPERATION

1. Local opening of breakers is accomplished as follows:
 - a. For electrically operated types, disable the breaker closing ability by positioning the charging power switch on the breaker front to OFF.
 - b. Depress the TRIP pushbutton (left pushbutton where two exist).
 - c. Verify the breaker trips and remains open.
2. Local closing of manual type breakers (large closing handle) is accomplished as follows:
 - a. Pull down the closing handle.
 - b. Verify the breaker closes and remains closed.
 - c. Investigate the cause if the breaker does not remain closed.
3. Local closing of electrically operated type breakers is accomplished as follows:
 - a. Open the panel directly behind the breaker on back of the switchgear.
 - b. Open both the CLOSE CP BRKR and the TRIP CP BRKR for the breaker to be operated.
 - c. Verify the breaker closing springs are charged.
 - d. If the breaker closing springs are discharged, perform Step 1) or 2) for the appropriate size breaker as follows:
 - 1) For 2000 or 3000 amp frame sizes, charge the springs as follows:
 - a) Insert a manual spring charging handle into the slot in the breaker front.
 - b) Pump the handle until the breaker indicates charged.

- 2) For 600 and 1600 amp frame sizes, charge the springs as follows:
 - a) Open the door on the breaker cubicle.
 - b) Engage a manual charging handle into the slots of the pawl carrier.

NOTE 3.d.2).c)

The pawl carrier is located on the breaker, on centerline, between the silver colored charging motor on the right and the black auxiliary switch assembly on the left. Occasionally, the charging motor will coast to a stop in such a position that the driving pawl does not engage the next tooth on the ratchet wheel.

When the driving pawl is not engaged on the ratchet wheel, a screwdriver blade should be inserted along the right side of the pawl carrier against the roller on the charging motor output eccentric and the roller should be pushed to manually rotate it. Afterwards, the charging handle should be inserted.

- c) Operate the handle until the breaker indicates charged.
 - e. Lift (or pull) the manual CLOSE lever.
 - f. Verify the breaker closes and remains closed.

7.2 KV BREAKER OPERATION

1. Perform local opening of breakers as follows:
 - a. Open the door to the appropriate switchgear cubicle.
 - b. Open the Closing Power breaker RRP (located on the right hand side of the cubicle).
 - c. Depress the MANUAL TRIP lever on the breaker.
 - d. Verify the breaker trips and remains open.
2. Perform local closing of breakers as follows:

CAUTION 2.a

If any relay flags are tripped, closing of breaker with no protection could be a personnel hazard.

- a. Verify no relays have tripped on the associated breaker.
- b. Open the door to the appropriate switchgear cubicle.
- c. Verify the closing springs are charged.
- d. If the closing springs are not charged, perform the following:
 - 1) Open the Closing Power breaker RRP (located on the right hand side of the cubicle).
 - 2) Use a ratchet and 5/8" socket to turn the charging motor until the breaker indicates charged.
- e. Depress the MANUAL CLOSE pushbutton on the breaker.
- f. Verify the breaker closes and remains closed.
- g. If the breaker does not close, perform the following:
 - 1) Disconnect and tape all leads at terminals 361, 363 and 364 on terminal board C.
 - 2) Charge the springs per Step 2.d above.
 - 3) Ensure the Trip Power breaker RRT (located on the right hand side of the cubicle) is closed.
 - 4) Depress the MANUAL CLOSE pushbutton on the breaker.
 - 5) Verify the breaker closes and remains closed.

OPERATION OF EQUIPMENT FROM 480 VOLT MOTOR CONTROL CENTERS

NOTE IX

This attachment is developed to operate pump motors, fan motors, or any continually operating piece of equipment, not motor operated valves.

1. Locate the appropriate cubicle in the Motor Control Center.
2. Position the breaker to OFF (RESET).
3. Open the cubicle door.
4. Remove the fuse from the cubicle.

CAUTION 5

- a. The line side terminals of breaker will be energized and should not be shorted or grounded.
- b. This installation bypasses all equipment protection interlocks except breaker overcurrent protection.

5. Disconnect the existing feed (Wire No. 3) from the contactor coil.
6. Connect one end of a jumper to the hot side of the fuse holder (Wire No. X1).
7. Connect the free end of the jumper to the contactor coil where the feed wire (Wire No. 3) was removed.
8. Close the cubicle door.
9. Use the breaker ON-OFF handle to operate the equipment.

REMOTE OPERATION OF
VALVES FROM 480V MOTOR CONTROL CENTERS

NOTE 1

MVG-8133B is a Power Lockout valve. Power Lockout valves require both Power Lockout and Valve Motor starter relays to be actuated simultaneously for remote operation. MVG-8133B starter relays are located in XMC1DB2Y 06EH and XMC1DB2Y 15CD.

CHG
B

1. Locate the Motor Control Center Cubicle(s) for the valve to be operated.
2. Position the breaker(s) to OFF(RESET).
3. Open the cubicle door(s).
4. Remove the control power fuse for motor starter with fuse pullers.
5. Locate the two motor starter relays in the appropriate cubicle.
6. Place a clamp-on ammeter around one of the following:
 - a. One heavy wire connected between the top of the motor starter relays and the circuit breaker.
 - b. One field motor lead.
7. Perform Step 7.a for digital ammeters or Step 7.b for analog ammeters as follows:
 - a. When using digital ammeters, perform the following:
 - 1) Ensure switch on face of meter is in C position.
 - 2) Depress and hold the red pushbutton on the meter side.
 - 3) Verify the display lights up.
 - b. When using analog ammeters, perform the following:
 - 1) Ensure meter pointer is unlocked (switch to left).
 - 2) Set Meter Scale to 0-6A.
8. Close the circuit breaker(s).
9. If applicable, actuate the Power Lockout relay contactor and hold.

CHG
B

NOTE 10

- a. Starting current for large valves may cause the ammeter to indicate full scale. Current should stabilize on scale within one to two seconds at the nominal value of running current listed for the valve on Attachment XIII.
 - b. While the motor is running, the meter will read low.
 - c. When the valve is at the end of its travel, the motor stalls at about five times its running current.
10. Actuate the desired motor starter relay contactor (left contactor to close the valve or right contactor to open the valve) by depressing through the appropriate slot with a screwdriver blade.
 11. Observe current on the ammeter for the following:
 - a. If current remains high, release contactor; valve is in the required position already.
 - b. If low, release contactor when current begins to rise sharply.
 12. If applicable, release the Power Lockout relay contactor.
 13. Re-open the circuit breaker(s).
 14. Remove the ammeter and close the cubicle door(s).

CROSS TRAIN CONNECTION OF BATTERY CHARGER XBC1A-1B
(ALIGNING AC FROM B TRAIN AND DC TO A TRAIN)

CAUTION 1

It is of primary importance to keep a battery charger supplying DPN-1HB. If XBC1B is not operable, leave XBC1A-1B on DPN-1HB and warn the Control Room that they will have to use local manual control of the Steamline Power Reliefs and the Emergency Feedwater Flow Control Valves when the A battery is exhausted.

1. Verify that XBC1A-1B, SWING BATTERY CHARGER, is not supplying DPN-1HB (TRAIN B-DC breaker is OFF).
2. Open both TRAIN A-AC and TRAIN B-AC breakers and both TRAIN A-DC and TRAIN B-DC breakers on XET-4003.
3. Insert the spare interlock key into the TRAIN B-AC or TRAIN A-DC interlock key slot on XET-4003 and bypass the interlock.
4. Close the TRAIN B-AC breaker on XET-4003.
5. Close the TRAIN A-DC breaker on XET-4003.
6. Open DPN-1HB-ED 13, BATTERY CHARGER 1A-1B FEED TO DPN1HB.
7. Close the following on XBC1A-1B Battery Charger:
 - a. DC OUTPUT.
 - b. AC INPUT.
8. Verify the DC OUTPUT VOLTMETER stabilizes between 129 VDC and 140 VDC.

NOTE 9

Allow five to ten seconds for the capacitors to fully charge and the battery charger to stabilize.

9. Verify the capacitors are fully charged by red indicator lights on XPN5294-ED, BATT CHARGER CAP BOX.

NOTE 10

IF XBA1A has been on a constant discharge, the battery charger voltage may drop below 129 VDC with a high charging rate of a nominal 360 amps, but voltage will return to 129 VDC to 140 VDC as the battery recharges.

10. Close DPN-1HA-ED 13, BATTERY CHARGER 1A-1B FEED TO DPN1HA.
11. Notify the Control Room that XBC1A-1B is cross connected.

NOMINAL RUNNING CURRENT FOR MOTOR OPERATED VALVES

| VALVE # | RUNNING CURRENT (AMPS) | VALVE # | RUNNING CURRENT (AMPS) |
|--------------|------------------------|--------------|------------------------|
| XVB09503A-CC | 0.75 | XVG08000A-RC | 3.5 |
| XVB09503B-CC | 0.75 | XVG08000B-RC | 3.5 |
| XVB09524A-CC | 0.75 | XVG08000C-RC | 3.5 |
| XVB09524B-CC | 0.75 | XVG08701A-RH | 4.4 |
| XVB09525A-CC | 0.75 | XVG08701B-RH | 3.5 |
| XVB09525B-CC | 0.75 | XVG08702A-RH | 3.8 |
| XVB09526A-CC | 0.75 | XVG08702B-RH | 5.1 |
| XVB09526B-CC | 0.75 | XVG08706A-RH | 3.5 |
| XVG09568-CC | 0.80 | XVG08706B-RH | 3.5 |
| XVG09600-CC | 0.39 | XVG08801A-SI | 3.5 |
| XVG09606-CC | 0.95 | XVG08801B-SI | 3.5 |
| XVG09625-CC | 0.80 | XVG08812A-SI | 13.8* |
| XVG09626-CC | 0.95 | XVG08812B-SI | 13.8* |
| XVG08106-CS | 3.5 | XVG03001A-SP | 2.4 |
| XVG08107-CS | 3.5 | XVG03001B-SP | 2.4 |
| XVG08108-CS | 3.5 | XVB03106A-SW | 0.39 |
| XVG08131A-CS | 2.4 | XVB03106B-SW | 0.39 |
| XVG08131B-CS | 2.4 | XVG03103A-SW | 2.3 |
| XVG08132A-CS | 3.5 | XVG03103B-SW | 2.3 |
| XVG08132B-CS | 3.5 | XVG03107A-SW | 2.8 |
| XVG08133A-CS | 3.5 | XVG03107B-SW | 2.8 |
| XVG08133B-CS | 3.5 | XVG03106A-SW | 2.3 |
| XVT08100-CS | 2.3 | XVG03108B-SW | 2.3 |
| XVT08102A-CS | 2.3 | XVG03108C-SW | 2.3 |
| XVT08102B-CS | 2.3 | XVG03108D-SW | 2.3 |
| XVT08102C-CS | 2.3 | XVG03109A-SW | 2.3 |
| XVT08109A-CS | 2.3 | XVG03109B-SW | 2.3 |
| XVT08109B-CS | 2.3 | XVG03109C-SW | 2.3 |
| XVT08109C-CS | 2.3 | XVG03109D-SW | 2.3 |

* Will require setting ammeter to higher scale.