UNIT 2(3)
DGA-13
REVISION 04

LOSS OF 125 VDC BATTERY CHARGERS WITH SIMULTANEOUS LOSS OF AUXILIARY ELECTRICAL POWER

Requirements:

1. NONE.

Special Controls/Reviews:

1. NONE.

W. Davis
Originator

J. Fiedler
Department Procedure Writer

N/A
Technical Reviewer/Verifier

Authorization

8/17/93
Effective Date

LOSS OF 125 VDC BATTERY CHARGERS WITH SIMULTANEOUS LOSS OF AUXILIARY ELECTRICAL POWER

A. SYMPTOMS:

1. Panel 902(3)-8 Annunciators:

   - A-9(B-10), U2(3) 125V BATT CHARGER 2(3) TROUBLE.
   - B-9(A-9), U2(3) 125V BATT CHARGER 2(3)A TROUBLE.
   - A-1, 4KV MAIN FEED BRK TRIP.
   - A-2, 4KV RES FEED BRK TRIP.
   - E-1, 4KV BUS 21/22 (31/32) VOLT LO.
   - D-3, 4KV BUS 23/24 (33/34) VOLTAGE LO.
   - E-3, 4KV BUS 23-1/24-1 (33-1/34-1) VOLT LO.
   - C-1, UNIT 2(3) AUX TR 21(31) TROUBLE.
   - C-2, UNIT 2(3) RES AUX TR 22(32) TROUBLE.
   - E-2, RES AUX TR 22(32) TRIP.

2. Loss of Unit 2(3) Diesel Generator (D/G) AND/OR 2/3 D/G (Diesel Generator).

B. AUTOMATIC ACTIONS:

1. Reactor scram on EPA trip.
2. Main turbine AND generator trip.
3. 2/3 D/G auto starts AND transfers to BUS 23-1 OR BUS 33-1.
4. 2(3) D/G auto starts AND transfers to BUS 24-1(34-1).

C. IMMEDIATE OPERATOR ACTIONS:

1. IF power is lost to TR 21(31) AND TR 22(32),
   OR IF power is lost to TR 21(31) with Rx power greater than 45%,
   THEN verify the following:

   a. 2/3 D/G auto starts AND generator breaker to BUS 23-1 OR BUS 33-1 closes.

   b. 2(3) D/G auto starts AND generator breaker to BUS 24-1(34-1) closes.

2. Monitor and control the following per DEOP 100, Reactor Control:

   - Reactor pressure,
   - Reactor water level, AND,
   - Reactor power.

C. 3. Verify U2(3) 125 Vdc batteries have an operating battery charger:

NOTE

Dc load shedding must be completed within 30 minutes of loss of 125 Vdc battery chargers to ensure that batteries will supply a load of 62 amperes for four hours.

a. IF battery does NOT have an operating battery charger, THEN initiate 125 Vdc load shedding (Step D.2 for Unit 2, Step D.3 for Unit 3) IMMEDIATELY AND complete within 30 minutes.

4. Verify U2(3) 250 vdc batteries have an operating battery charger.

D. SUBSEQUENT OPERATOR ACTIONS:

CAUTION

Reactor must be cooled to where SDC system lineup may be accomplished within four hours (projected life of the 125 Vdc battery).

NOTE

A list of dc loads is contained in DOA 6900-T1, Unit 2 and Unit 3 125 Vdc Battery System Detailed Load List.

1. Perform reactor scram recovery AND initiate a reactor cooldown at less than or equal to 100°F/hour.

2. UNIT 2 ONLY Shed 125 Vdc loads as follows:

NOTE

1. Opening U2 125 Vdc TBX Main Bus 2A-1 Dist Panel breaker 9 can trip 345 kV transmission lines.

2. Step D.2.a may be performed out of sequence.

3. Due to the time required to notify the Load Dispatcher, load shedding should NOT be delayed while waiting for Load Dispatcher notification.

a. Notify Joliet Load Dispatcher that directional comparison and direct transfer trip protective relaying system is to have power removed.

(1) WHEN Joliet Load Dispatcher has been notified, THEN open the following breaker on U2 125 VDC TURB BLDG MAIN BUS 2A-1 DIST PNL (ESS DIV I):

- Breaker 9, PANELS 1 AND 1A 345 KV SWITCHYARD RELAYING AND CONTROL.

(2) IF the 345 Kv switchyard becomes operable, THEN close U2 125 Vdc TBX Main Bus 2A-1 Dist Panel Breaker 9, PANELS 1 AND 1A 345 KV SWITCHYARD RELAYING AND CONTROL, to restore operation of 345 kV switchyard breakers.

D. 2. b. Open the breakers listed in Table 1, U2 125 VDC TURB BLDG MAIN BUS 2A-1 DIST PNL (ESS DIV I).

TABLE 1, U2 125 VDC TURB BLDG MAIN BUS 2A-1 DIST PNL (ESS DIV I)	
BREAKER	DESCRIPTION
NOTE A fire watch must be established in the Diesel Generator Room within 1 hour of U2 125 Vdc TBX Main Bus 2A-1 Dist Pnl breaker 14 being opened per Dresden Administrative Technical Requirements 3.1.1.1.a.	
14	PANEL 2223-53 (MAIN FEED) CO2 FIRE PROTECTION
15	PANEL 2252-45 AND JUNCTION BOX 2TB-100 WATER SPRAY FIRE PROTECTION MONITOR
17	PANEL 2223-90 AUXILIARY ELECTRIC ROOM HALON, EMERGENCY LIGHTING CABINET 20 MAIN TURBINE FLOOR EL 561'
18	EMERGENCY LIGHTING CABINET 10 MAIN CONTROL ROOM
19	EMERGENCY LIGHTING CABINET 30 UNIT 2/3 RADWASTE EL 517'
23	PANEL 923-1 HYDROGEN STORAGE BANK CONTROL VALVES
24	PANEL 923-6 COOLING LAKE LIFT STATION MASTER SUPERVISORY PANEL
27	FLOW REGULATING STATION 480VAC MAIN FEED CIRCUIT BREAKER
28	PANEL 2223-4 RADWASTE CONTROL PANEL, PANEL 2223-6 MAX RECYCLE CONTROL PANEL

c. Open the breakers listed in Table 2, U2 125 VDC TURB BLDG MAIN BUS 2A-2 DIST PNL (NON-ESS).

TABLE 2, U2 125 VDC TURB BLDG MAIN BUS 2A-2 DIST PNL (NON-ESS)	
BREAKER	DESCRIPTION
3	BUS 25 CONTROL POWER (MAIN FEED) 480 VAC SWGR
6	BUS 27 CONTROL POWER (RESERVE FEED) 480 VAC SWGR
7	PANEL 902-29 (MAIN FEED) GENERATOR AND TRANSFORMER BACKUP PROTECTIVE RELAYS
8	PANEL 902-29 (RESERVE FEED) GENERATOR AND TRANSFORMER PRIMARY PROTECTIVE RELAYS
9	PANEL 902-31 (MAIN FEED) EHC SYSTEM TRIPPING BUS AND ALARMS
10	CUBICLE 2252-6 (MAIN FEED) GENERATOR VOLTAGE REGULATOR
12	CABINET 2252-7 (MAIN FEED) HYDROGEN AND STATOR COOLING CABINET

D. 2. d. Open the following breaker on U2 125 VDC TURB BLDG RES BUS 2B-1 DIST PNL (ESS DIV II):

- Breaker 10, PANEL 2202-70B ATWS SYSTEM II INVERTER.

e. Open the following breaker on U2 125 VDC TURB BLDG RES BUS 2B-2 DIST PANEL (NON-ESS):

- Breaker 4, BUS 26 CONTROL POWER (MAIN FEED) 480 VAC SWGR.

f. Open the breakers listed in Table 3, U2 125 VDC REACTOR BLDG DIST PANEL (ESS DIV I):

Table 3, U2 125 VDC REACTOR BLDG DIST PANEL (ESS DIV I)

BREAKER	DESCRIPTION
1	EMERGENCY LIGHTING CABINET 29 REACTOR BUILDING EL. 570'
13	PANEL 2202-70A ATWS SYSTEM I INVERTER
14	PANEL 2252-24 UNIT-2 REACTOR BUILDING VENTILATION/EXHAUST SYSTEM LOGIC
15	SPACE HEATER 125 VDC REACTOR BUILDING DISTRIBUTION PANEL

3. UNIT 3 ONLY Shed 125 Vdc loads as follows:

NOTE

1. Opening U3 125 Vdc TBX Main Bus 3A-2 Dist Panel breaker 5 can trip 345 kV transmission lines.
2. Step D.3.a may be performed out of sequence.
3. Due to the time required to notify the Load Dispatcher, load shedding should NOT be delayed while waiting for Load Dispatcher notification.

a. Notify Joliet Load Dispatcher that directional comparison and direct transfer trip protective relaying system is to have power removed.

(1) WHEN Joliet Load Dispatcher has been notified, THEN open the following breaker on U3 125 VDC TURB BLDG MAIN BUS 3A-2 DIST PNL (NON-ESS):

- Breaker 5, PANELS 2 AND 2A 345 KV SWITCHYARD RELAYING AND CONTROL.

(2) IF the 345 kV switchyard becomes operable, THEN close U3 125 Vdc TBX Main Bus 3A-2 Dist Panel Breaker 5, PANELS 2 AND 2A 345 KV SWITCHYARD RELAYING AND CONTROL, to restore operation of 345 kV switchyard breakers.

D. 3. b. Open the breakers listed in Table 4, U3 125 VDC TURB BLDG MAIN BUS 3A-2 DIST PNL (NON ESS):

Table 4, U3 125 VDC TURB BLDG MAIN BUS 3A-2 DIST PNL (NON ESS)	
BREAKER	DESCRIPTION
3	BUS 35 CONTROL POWER (MAIN FEED) 480 VAC SWGR
6	BUS 37 CONTROL POWER (RESERVE FEED) 480 VAC SWGR
7	PANEL 903-29 (MAIN FEED) GENERATOR AND TRANSFORMER BACKUP PROTECTIVE RELAYS
9	PANEL 903-31 (MAIN FEED) EHC SYSTEM TRIPPING BUS AND ALARMS
10	PANEL 2253-6 (MAIN FEED) GENERATOR VOLTAGE REGULATOR
12	PANEL 2253-7 (MAIN FEED) HYDROGEN AND STATOR COOLING PANEL
13	EMERGENCY LIGHTING CABINET 50 UNIT-3 MAIN TURBINE FLOOR EL. 561' SOUTH
15	FLOW REGULATING STATION 480 VAC MCC RESERVE FEED CIRCUIT BREAKER
16	PANEL 2253-44 AND PANEL 2253-45 HYDROGEN SEAL OIL UNIT AND TRANSFORMER FIRE PROTECTION
19	PANEL 2253-45 AND JUNCTION BOX 3TB-60 WATER SPRAY FIRE PROTECTION MONITOR
20	PANEL 2223-53 (RESERVE FEED) CO2 FIRE PROTECTION

c. Open the breakers listed in Table 5, U3 125 VDC TURB BLDG RES BUS 3B-2 DIST PNL (NON-ESS):

Table 5, U3 125 VDC TURB BLDG RES BUS 3B-2 DIST PNL (NON-ESS):	
BREAKER	DESCRIPTION
11	BUS 36 CONTROL POWER (MAIN FEED) 480 VAC SWGR
15	BUS 35 CONTROL POWER (RESERVE FEED) 480 VAC SWGR

D. 3. d. Open the breakers listed in Table 6, U3 125 VDC REACTOR BLDG DIST PANEL (ESS DIV I):

Table 6, U3 125 VDC REACTOR BLDG DIST PANEL (ESS DIV I)	
BREAKER	DESCRIPTION
1	EMERGENCY LIGHTING CABINET 59 UNIT-3 REACTOR BUILDING EL. 570'
13	PANEL 2203-70A ATWS SYSTEM I INVERTER
14	PANEL 2253-24 UNIT-3 REACTOR BUILDING VENTILATION/EXHAUST SYSTEM LOGIC
15	SPACE HEATER UNIT-3 125 VDC REACTOR BUILDING DISTRIBUTION PANEL

NOTE

IF 125Vdc Battery voltage drops to less than or equal to 80Vdc, THEN IC may receive a spurious Group 5 Isolation due to relay repositioning on low voltage.

CAUTION

Performance of Step D.4. will defeat Group 5 Isolation and require an operator to manually operate MO 2(3)-1301-3, RX INLET ISOL valve to control cooldown rate.

4. ● Monitor 125Vdc Battery voltage.

a. IF all auxiliary electrical power is lost and there is no power available from any diesel generator (Station Blackout (SBO)) and battery voltage approaches 80Vdc and IC must remain in service as determined by Shift Supervisor, THEN perform the following:

(1) Verify the following valves are OPEN.

- MO 2(3)-1301-1, RX OUTLET ISOL
- MO 2(3)-1301-2, RX OUTLET ISOL
- MO 2(3)-1301-4, RX INLET ISOL

b. Verify MO 2(3)-1301-3, RX INLET ISOL valve is throttled to maintain cooldown rate as determined by Shift Supervisor.

c. OPEN the following breakers.

(1) MO 2(3)-1301-1, U2(3) ISOL CONDENSER STEAM INLET INBD ISOL VLV (MCC 28(38)-1)

(2) MO 2(3)-1301-2, U2(3) ISOL CDSR STEAM INLET OTBD ISOL VLV (250Vdc) MCC 2(3)A)

D. 4. c. (3) MO 2(3)-1301-3, U2(3) ISOL CDSR COND OUTLET OTBD ISOL VLV (250Vdc MCC 2(3)-A)

(4) MO 2(3)-1301-4, U2(3) ISOL CDSR COND OUTLET INBD ISOL VLV (MCC 28(38)-1)

d. Control Cooldown rate by manually operating MO 2(3)-1301-3, RX INLET ISOL valve. © (W-2)

5. Monitor 125 Vdc battery voltage AND restore an ac feed. IF loss of battery chargers affects only one unit, THEN other unit's spare charger could be used to power battery and unit loads of affected chargers.

6. WHEN power is restored to battery chargers, THEN restore 125 Vdc system per DOP 6900-02, 125 Vdc Electrical System.

7. © WHEN 125Vdc Battery voltage is restored to normal, THEN close the following breakers.

a. MO 2(3)-1301-1, U2(3) ISOL CONDENSER STEAM INLET INBD ISOL VLV (MCC 28(38)-1)

b. MO 2(3)-1301-2, U2(3) ISOL CDSR STEAM INLET OTBD ISOL VLV (250Vdc MCC 2(3)A)

c. MO 2(3)-1301-3, U2(3) ISOL CDSR COND OUTLET OTBD ISOL VLV (250Vdc MCC 2(3)A)

d. MO 2(3)-1301-4, U2(3) ISOL CDSR COND OUTLET INBD ISOL VLV (MCC 28(38)-1) © (W-2)

E. USER REFERENCES:

1. Dresden Administrative Technical Requirements:

a. Section 3.1.

2. Procedures:

a. DEOP 100, Reactor Control.

b. DGA-12, Partial or Complete Loss of AC Power.

c. DOP 6900-02, 125 Vdc Electrical System.

F. DISCUSSION:

1. This procedure addresses a loss of off-site power in conjunction with loss of battery chargers on a unit. It does not address these events plus a Loss of Coolant Accident (LOCA). Any small break or large break LOCA could be handled simultaneously with this procedure. The scenario of this procedure is the limiting case, as any LOCA would only aid in depressurization and result in the unit being in Cold Shutdown within the capacity of the battery.

2. SDC must be lined up with pumps operating within 4 hours of loss of ac to the battery chargers, because many breakers will experience a loss of control when the battery exceeds its design life.

W. WRITER'S REFERENCES:

1. Letter from M. Tucker to D.J. Scott dated 1-23-85.

2. Generic Letter 88-20, NTS 237-104-88-02001S1