



PHARMA DEVILS

ENGINEERING DEPARTMENT

STANDARD OPERATING PROCEDURE

Department: Engineering	SOP No.:
Title: Procedure for Changeover of Electrical power supply from Power Supply to DG set	Effective Date:
Supersedes: Nil	Review Date:
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1.0 OBJECTIVE:

To lay down procedure for the operation of Changeover from Power Supply to 750 KVA DG & vice versa.

2.0 SCOPE:

This SOP is applicable for Operation of Changeover from Power Supply to 750 KVA DG. & Vice versa.

3.0 RESPONSIBILITY:

Engineering Supervisor/technician will operate the DG and maintained the daily log sheet
Executive Engineering will check the daily log sheet
Manager Engineering will verify the daily log sheet

4.0 PROCEDURE:

4.1 STARTING OF MANUAL CHANGEOVER from HPSEB Supply to 750 KVA DG SET

- 4.1.1 Ensure HPSEB 3Ph Supply (410-420 VAC) OFF on LT panel no 03 Feeder 16F1 and Main ACB OFF Indicator glow Green.
- 4.1.2 Ensure Bus Coupler ACB OFF Indicator glow Green on LT panel no 03 Feeder 8F1.
- 4.1.3 Select Peak Load Selector Switch OFF' position on LT Panel no 03 Feeder 16 F1
- 4.1.4 Select PLC Selector Switch 1S1and3S1 to ' OFF' position
- 4.1.5 Select Selector Switch 1S2, 2S1, 3S2 & 4S1 in Manual position
- 4.1.6 Make sure oil pressure indicators, temperature indicator, Pressure Gauge, warning lights and other gauges should be on operational condition.
- 4.1.7 Make sure that the battery connection to the ECP is of correct polarity. Turn the key switch to the 'ON' position the display shows '0000' to '9999' sequentially.
- 4.1.8 Check engine oil level and make sure that is near H level mark.
- 4.1.9 Switch on CT Fan motor MCCB of Sub Utility Panel no 12 Feeder C-3.
- 4.1.10 Switch on CWP1/2 Drive MCCB of Sub Utility Panel no 12 Feeder C1 / C2.
- 4.1.11 Switch on CWP1 or CWP 2 of DG cooling tower from DG Drive Panel no 18 and make sure cooling water minimum pressure (3 kg/cm²).
- 4.1.12 Set throttle in idle position.
- 4.1.13 Switch ON priming pump from Sub Utility Panel no 18 Feeder E-3 for 3 minute.
- 4.1.14 Switch OFF priming pump from Sub Utility Panel no 18 AFTER 3 minute.
- 4.1.15 Check all parameters on ECP no 14 in DG.
- 4.1.16 Turn the key switch to the START position.
- 4.1.17 Set throttle in RUN position at approximately 1500 RPM and check R Y B Indicator glow, Voltage (440 VAC) & Frequency 50 Hz on LT Panel no 03 Feeder 7F1.



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- 4.1.18 Select PLC Selector Switch 1S1 and 3S1 to 'OFF' position.
- 4.1.19 Select Selector Switch 1S2, 2S1, 3S2 & 4S1 in Manual position.
- 4.1.20 Rotate Rotary Switch of incomer (I/C) ACB DG-1 to CLOSE position Feeder 7F1
- 4.1.21 Ensure DG-1 ACB ON Indicator glow red
- 4.1.22 Rotate Rotary Switch of Bus Coupler ACB to CLOSE position from LT panel no 3 Feeder 8F1 & Bus Coupler ACB ON Indicator glow red in LT panel no 03 Feeder 8F1
- 4.1.23 Switch OFF Incomer (I / C) MCCB for Capacitor-1 from LT Panel no 03 Feeder 13F4
- 4.1.24 Switch OFF Incomer (I/C) MCCB for Capacitor-2 from LT Panel no 03 Feeder 3F4
- 4.1.25 Ensure whole Plant Power Distribution Completed

4.2.1 STARTING OF MANUAL CHANGEOVER from 750 KVA DG SET to HPSEB Supply

- 4.2.2 Ensure HPSEB 3Ph Supply (410-420 VAC) available on LT Panel no 03 Feeder 16F1 R, Y, B Indicators glow Red, Yellow & Green on LT Panel no 03 Feeder 16F1
- 4.2.3 Ensure ACB OFF Indicator glow Green. on LT Panel no 03 Feeder 16F1
- 4.2.4 Select Peak Load Selector Switch to ON position on LT Panel Feeder 16 F1 .
- 4.2.5 Rotate Rotary Switch of DG ACB to TRIP position from LT Panel no 03 Feeder 7F1
- 4.2.6 Rotate Rotary Switch of MAIN ACB to CLOSE position from LT Panel no 03 Feeder 16F1
- 4.2.7 Ensure Main ACB ON Indicator glow Red.
- 4.2.8 Rotate Rotary Switch of Bus Coupler ACB to CLOSE position from LT Panel no 03 Feeder 8F1.
- 4.2.9 Ensure Bus Coupler ACB ON Indicator glow Red on LT Panel no 03 Feeder 8F1.
- 4.2.10 Switch ON Incomer (I / C) MCCB for Capacitor-1 from LT Panel no 03 Feeder 13F4.
- 4.2.11 Select Capacitor Auto / Manual Selector Switch to AUTO position ON LT Panel Feeder 13F, 14F & 15F
- 4.2.12 Ensure whole Plant Power Distribution Completed
- 4.2.13 Allow the engine to idle 3 minutes after a full load operation before shutting it off
- 4.2.14 Turn the ignition key to off to OFF position

4.3 STARTING OF AUTO CHANGEOVER from HPSEB Supply to 750 KVA DG SET

- 4.3.1 Make sure that the battery connection to the ECP is of correct polarity. Turn the key switch to the 'ON' position the display shows '0000' to '9999' sequentially.
- 4.3.2 Check all parameters on ECP no 14 in DG.
- 4.3.3 Set throttle in RUN position



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- 4.3.4 Select Peak Load Selector Switch ON' position on LT Panel no 03 Feeder 16 F1.
- 4.3.5 Select PLC Selector Switch 1S1and3S1 to ' ON' position
- 4.3.6 Select Selector Switch 1S2, 2S1,2S2, 3S2 ,4S1 & 4S2 in AUTO position
- 4.3.7 Ensure HPSEB 3Ph Supply (11K VAC) OFF on VCB panel no 01
- 4.3.8 When HPSEB 3Ph Supply (410-420 VAC) OFF on LT panel no 03 Feeder 16F1 and Main ACB OFF Indicator glow Green.
- 4.3.9 After 5second PLC give START COMMAND to DG.
- 4.3.10 After 30 second DG RUN at 1500 RPM and check R Y B Indicator glow, Voltage (440 VAC) & Frequency 50 Hz on LT Panel no 03 Feeder 7F1.
- 4.3.11 After 5 second DG ACB in CLOSED Position.
- 4.3.12 After 5 second BUS COUPLER ACB in CLOSED Position.
- 4.3.13 Ensure CT Fan motor& CWP1/2 Drive in RUN Position

4.4 STARTING OF AUTO CHANGEOVER from 750 KVA DG SET to HPSEB Supply.

- 4.4.1 Ensure HPSEB 3Ph Supply (11KVAC) available on VCB Panel no 01 and R, Y, B Indicators glow Red, Yellow & Green.
- 4.4.2 Ensure HPSEB 3Ph Supply (410-420 VAC) available on LT Panel no 03 Feeder 16F1 R, Y, B Indicators glow Red, Yellow & Green on LT Panel no 03 Feeder 16F1.
- 4.4.3 After 5 second DG ACB in OPEN Position and OFF Indicator glow Green in LT Panel no 03 Feeder no 7F1.
- 4.4.4 After 5 second BUS COUPLER ACB in OPEN Position and OFF Indicator glow Green in LT Panel no 03 Feeder no 8F1.
- 4.4.5 After 20 second MAIN (HPSEB) ACB in CLOSED Position and ON Indicator glow Red in LT Panel no 03 Feeder no 16F1.
- 4.4.6 After 5 second BUS COUPLER ACB in CLOSED Position and ON Indicator glow Red in LT Panel no 03 Feeder no 8F1.
- 4.4.7 After 90 second PLC give STOP COMMAND to DG.

5.0 SAFETY AND PRECAUTIONS

- 5.1.1 As per manufacturer manual.
- 5.1.2 Capacitor Bank should be Switch ON during HPSEB operation.



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6.0 REVISION HISTORY:

Revision No.	Reason for Revision	Superseded from & date
00	New	_____

7.0 REFERENCES:

Operation & Maintenance Manual
Panel Drawing

8.0 ABBREVIATIONS:

SOP: Standard Operating Procedure
ACB: Air Circuit Breaker
PDP: Power Distribution Panel
CT: Cooling Tower
CWP: Cooling Water Pump
ChWP: Chilled Water Pump
F: Feeder in LT Panel
A to E: Feeder in other Panels
ECP: Electronic Control Panel
A/M: Auto/Manual
PLC: Programmable Logic Controller
MCCB: Miniature Circuit Breaker
LT: Low Terminal

9.0 ANNEXURES

Annexure I: ACB, Selector Switch, MCCB details
Annexure II: Daily Log Sheet of Power Supply to DG Set
Annexure III: Panel Details



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Annexure I

ACB, Selector Switch, MCCB details

S.No.	DETAILS	DESCRIPTION	PANEL No.	FEEDER No.
1	1S1	PLC ON/OFF Selector switch	03	7F1
2	1S2	DG -1 ACB A/M Selector Switch	03	7F1
3	1S3	DG-1 stop A/M Selector Switch	03	7F1
4	2S1	Bus Coupler ACB A/M Selector Switch	03	8F1
5	2S1	Bus Coupler ACB A/M Selector Switch	03	8F1
6	3S1	PLC ON/OFF Selector switch	03	9F1
7	3S2	DG-2 ACB A/M Selector Switch	03	9F1
8	3S3	DG-2 stop A/M Selector Switch	03	9F1
9	4S1	Main ACB Selector switch	03	16F1
10	4S2	A/M Changeover Selector switch	03	16F1
11	ACB-1	DG-1 ACB	03	7F2
12	ACB-2	Bus Coupler ACB	03	8F2
13	ACB-3	DG-2 ACB	03	9F2
14	ACB-4	Main ACB (HPSEB)	03	16F2
15	ACB-5	Power Distribution Panel ACB	03	6F2
16	ACB-6	MCC Room PDP ACB	04	A-2



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PANEL No.	DESCRIPTION	AREA	LOCATION
01	Vacuum Circuit Breaker Panel	Utility	VCB Room
02	Remote Tap Changer Panel	Utility	Sub Station
03	LT/PCC Panel	Utility	Sub Station
04	Power Distribution Panel	Service Floor	MCC Room
05	Production Equipment Panel	Service Floor	MCC Room
06	AHU Classified Panel	Service Floor	MCC Room
07	AHU Non Classified Panel	Service Floor	MCC Room
08	General Power Panel	Service Floor	MCC Room
09	Internal Lighting Panel	Service Floor	MCC Room
10	External Lighting Panel	Utility	Sub Station
11	Utility / Chiller Panel	Utility	Utility Room
12	Sub Utility Panel	Utility	Utility Room
13	Street Light Panel	Utility	Utility Room
14	Electronic Control Panel	Utility	DG
15	ChWP Drive Panel	Utility	Utility Room
16	CWP for Chiller Drive Panel	Utility	Utility Room
17	CWP for DG Drive Panel	Utility	Sub Station
18	CWP for Process Drive Panel	Utility	Utility