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| Title:  **DG Set** | | | | Page 1 of 1 | |
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**Objective:**

To establish a procedure for starting Diesel Generator set in Manual & Automatic mode through PLC

**Policy:**

The operation of Diesel Generator should be safe, smooth and trouble free

**Responsibility:**

DG Operator on duty

**Procedures:**

**Manual operation (Individual DG):**

1. Check radiator water level.
2. Check diesel level in tank.
3. Check level of lube oil in the sump.
4. Check the level of coolant.
5. Make sure that ACB draw out shutter is closed position.
6. Select ‘MANUAL’ mode in EGCP (WOODWARDS) on DG control panel. And press ‘Clear’ button to reset alarms if there are any.
7. Press ‘START’ button and hold it till such time engine attains required RPM (Protection Green LED should come on).
8. Once the Voltage is developed, press ‘ON’ button in EGCP to close the DG-ACB.
9. When EB power returns, check the condition of EB power, such as voltage, frequency, if found normal and stable press ‘OFF’ button in EGCP to open the DG-ACB.
10. Then close EB-1 or EB-2 Circuit Breaker as required to transfer the load.
11. Then after 3 minutes, press ‘STOP’ button in EGCP to stop the engine.

**Auto Operation (Synchronizing):**

1. Select ‘Auto’ mode in Auto/Manual Switch in Bus-coupler panel.
2. Select ‘Auto’ mode in EGCP-2 (WOODWARDS), LED will glow above the Auto button when selected.
3. Check PLC display for any alarms, press ‘Alarm Event & Alarm Clear’ then press Enter to reset if any.
4. All 3 DGs gets synchronized in 10 to 13 seconds and accept load.
5. PLC will monitor all 3 DGs running for 20 minutes
6. If the load drops below 2000 KW, one will go off and standby.
7. If the load drops below 1500 KW, another DG will go off and standby. And only one DG will run.
8. If the load increases to 1600 KW or above another DG will start and gets synchronized.
9. If the load increases to 2000 KW or above another DG will start and gets synchronized.
10. When EB power returns, DGs still run with load and PLC will monitor the condition of EB power for 1 minutes.
11. If EB power is healthy and stable, load transfer will take place from DGs to EB.
12. DGs will run without load for 3 minutes to cool down.
13. If EB power fails while DGs are in cool down mode, load transfer will take place without shutting down. And synchronization sequence will repeat.

**Manual Operation When Auto Synchronizing Fails:**

1. Keep that particular DG in Manual mode.
2. ACCEPT the fault in the FAULT ACCEPT/RESET selector switch in bus coupler.
3. Acknowledge the faults on touch screen
4. Find the cause of the fault occurred.
5. Clear the fault in EGCP-2 (Press clear button until alarm LED goes OFF in EGCP-2).
6. RESET the fault in FAULT ACCEPT/RESET selector switch in bus coupler panel.
7. Then select Auto in EGCP-2 and AUTO/MANUAL key switch.
8. If faults repeat, go to Manual Operation.

**Emergency Operation (Solo Operation):**

**NOTE:** **THIS OPERATION SHOULD BE DONE ONLY WHEN AUTO AND MANUAL SYNCHRONIZING FAILS.**

1. Switch OFF EGCP-20 control MCB or remove OEM connector at the DG set.
2. Start the DG from DG set.
3. Close (ON) the Neutral Contactor from the Neutral ON/OFF Selector Switch in the Bus coupler panel of that particular DG.
4. Close the DG-ACB by directly pushing ‘ON’ button on the ACB.
5. If the load is more than the designated load, switch OFF Bus-coupler in both DG and LT panel.
6. Start another DG on DEAD BUS side.
7. Close the Outgoing-2 breaker (ACB)
8. Close DG incomer-2 in Main LT panel.

# Safety Precautions

1. Check and ensure canopy lights are always in working condition.
2. Check and ensure the emergency stop button is functional.
3. Ensure all safety guards are kept intact.
4. Ensure strict vigilance, supervision while carrying out activities like welding which may lead to fire.
5. DO NOT touch any part/ carry out any maintenance while DG set is in running condition.
6. Check and ensure the Doors of the canopy are closed while the DG is in running condition.
7. Strictly follow Tag Out, Lock Out procedure while carrying out maintenance.
8. DO NOT Open the radiator cap while the DG set is running or in hot condition.
9. Check and ensure the floor, parts are free from grease, lube oil, diesel where maintenance is carried out to avoid slipping.
10. Check and ensure there is no spillage of Diesel/Lube oil. If observed, place a metallic tray to collect the same.
11. Check and ensure adequate numbers of appropriate serviceable Fire Extinguishers /sand buckets are placed in the DG yard.

**Revision Guide:**

Any change in the system needs review of SOP.