



**CONTROL DESCRIPTIONS**

- MC-1\*** EMERGENCY DIESEL GENERATOR 1-1 LOCKOUT RELAY 86-1/DO1 (ZONE A-5) WILL AUTOMATICALLY ACTUATE IF ANY OF THE FOLLOWING CONDITIONS OCCUR WHILE DO 1-1 2000 RPM:
  - GROUND OVERCURRENT AS SENSED BY 51G/DO RELAY (ZONE A-4).
  - PHASE A, B OR C OVERCURRENT AS SENSED BY 51V-1/DO RELAY (ZONE B-4).
  - REVERSE POWER AS SENSED BY 32/DO RELAY (ZONE B-6).
  - NEGATIVE PHASE SEQUENCE AS SENSED BY 46/DO RELAY (ZONE B-5).
  - LOSS OF FIELD AS SENSED BY 4D/DO RELAY (ZONE B-5) AND 50/DO RELAY (ZONE D-4).
- MC-2\*** EMERGENCY DIESEL GENERATOR 1-1 LOCKOUT RELAY 86-2/DO1 (ZONE E-3) WILL AUTOMATICALLY ACTUATE IF ANY OF THE FOLLOWING CONDITIONS OCCUR WHILE DO 1-1 2000 RPM:
  - GENERATOR DIFFERENTIAL AS SENSED BY 87/DO RELAY (ZONE E-3).
  - ENGINE AUTOMATIC SHUTDOWN, SEE MC-2\*.
  - ACTUATION OF 86-2/DO1 WILL AUTOMATICALLY CAUSE THE FOLLOWING TO OCCUR:
    - TRIP AND LOCKOUT EMERGENCY DIESEL GENERATOR BREAKER AC101 (ZONE F-4).
    - TRIP EXCITATION (ZONE C-3), (SHORT THE FIELD).

**CONTROL LOGICS**

- MC-1\*** EMERGENCY DIESEL GENERATOR 1-1 BREAKER AC101 (ZONE E-4) WILL AUTOMATICALLY CLOSE IF THERE IS AN UNDERVOLTAGE CONDITION AT 4.18KV BUS C1 FOR 20.6 SEC AS SENSED BY 50V1 RELAY (OS-05B, D-5) PROVIDED THE FOLLOWING CONDITIONS EXIST:
  - EMERGENCY DIESEL GENERATOR LOCKOUT RELAY 86-1/DO1 (ZONE A-5) IS RESET. SEE MC-1\*.
  - EMERGENCY DIESEL GENERATOR LOCKOUT RELAY 86-2/DO1 (ZONE E-3) IS RESET. SEE MC-2\*.
  - BUS C1 LOCKOUT RELAY 86-1/C1 (OS-05B, E-4) IS RESET. SEE OS-05B H-14.
  - EMERGENCY DIESEL GENERATOR 1-1 IS AT RATED SPEED AND VOLTAGE.
  - BUS TIE TRANSFORMER BO BREAKER ABOC1 (OS-05B, D-2) IS OPEN.
  - BUS C1 AND C2 TIE BREAKER AC110 (OS-05B, D-9) IS OPEN.
- MC-2\*** EMERGENCY DIESEL GENERATOR 1-1 BREAKER AC101 (ZONE E-4) WILL AUTOMATICALLY CLOSE IF THERE IS AN UNDERVOLTAGE CONDITION AT 4.18KV BUS C1 FOR 20.6 SEC AS SENSED BY 50V1 RELAY (OS-05B, D-5) PROVIDED THE FOLLOWING CONDITIONS EXIST:
  - EMERGENCY DIESEL GENERATOR LOCKOUT RELAY 86-1/DO1 (ZONE A-5) IS RESET. SEE MC-1\*.
  - EMERGENCY DIESEL GENERATOR LOCKOUT RELAY 86-2/DO1 (ZONE E-3) IS RESET. SEE MC-2\*.
  - BUS C1 LOCKOUT RELAY 86-1/C1 (OS-05B, E-4) IS RESET. SEE OS-05B H-14.
  - EMERGENCY DIESEL GENERATOR 1-1 IS AT RATED SPEED AND VOLTAGE.
  - BUS TIE TRANSFORMER BO BREAKER ABOC1 (OS-05B, D-2) IS OPEN.
  - BUS C1 AND C2 TIE BREAKER AC110 (OS-05B, D-9) IS OPEN.

**CONTROL LOGICS (CONT'D)**

- MC-2\*** EMERGENCY DIESEL GENERATOR 1-1 WILL RECEIVE AN AUTOMATIC/EMERGENCY START SIGNAL IF ANY OF THE FOLLOWING CONDITIONS EXIST:
  - 4.18KV BUS C1 UNDERVOLTAGE FOR 20.6 SEC AS SENSED BY 50V1 RELAY (OS-05B, D-5).
  - SAFETY FEATURES ACTUATION SYSTEM (SFAS) LEVEL 2.
  - REMOTE START PUSHBUTTON HS1147B (OS-0418, B-8) IS DEPRESSED AND MAINTAINED DEPRESSED.
  - "EOD 1 START" PUSHBUTTON HS1147C (OS-0418, C-3) AT ENGINE CONTROL PANEL C3615 IS DEPRESSED AND MAINTAINED DEPRESSED.
- EMERGENCY DIESEL GENERATOR 1-1 WILL AUTOMATICALLY SHUTDOWN VIA THE SHUTDOWN/LOCKOUT RELAY (86R) (NOT SHOWN) IF ANY OF THE FOLLOWING CONDITIONS EXIST:
  - LOCKOUT RELAY 86-2/DO1 (ZONE E-3) ACTUATES. SEE MC-2\*.
  - ENGINE FAILS TO START. SEE NOTE 2.
  - ENGINE SPEED 1100 RPM AS SENSED BY OVERSPEED TRIP SWITCH OTS1 (ZONE D-8).
  - CRANKCASE PRESSURE 2.110 PSI AS SENSED BY PSH20179 (ZONE E-12).
  - OIL PRESSURE 2.20 PSID AS SENSED BY PSL20145 (ZONE E-11).
  - JACKET WATER TEMPERATURE 1.208 °F AS SENSED BY TSH20151 (ZONE C-5).
  - EMERGENCY SHUTDOWN PUSHBUTTON (NOT SHOWN) AT ENGINE CONTROL PANEL C3621 IS DEPRESSED.

**ANNUNCIATOR TABLE**

ANNUNCIATOR	ANNUNCIATOR ENGRAVING
1-1-A	TRIP
1-1-B	FAIL
1-1-C	CURRENT HI
1-1-D	FREQUENCY
1-1-E	DC TURBO OIL PUMP ON (NOTE 14)
1-1-F	NOT READY FOR AUTO START/ABNORM SW POS (NOTE 17)
1-1-G	UNIT LOCKOUT (SEE MC-2*)
1-1-H	FAIL TO START (NOTE 2)
1-1-I	TO REACH RATED SPEED & VOLTAGE (NOTE 3)
1-1-J	BLWV FUSE LOSS OF POWER (NOTE 13)
1-1-K	OVERSPEED
1-1-L	LOW LUBE OIL LEVEL
1-1-M	LOW JACKET WATER TEMPERATURE
1-1-N	HIGH JACKET WATER TEMPERATURE
1-1-O	HIGH CRANKCASE PRESSURE
1-1-P	PROTECTIVE RELAYS

**LEGEND**

- GREEN DENOTES DEVICES LOCATED IN THE CONTROL ROOM
- RED INDICATES EMERGENCY DIESEL GENERATOR 4.18KV LINEUP TO BUS C1
- BLUE DENOTES ENGINE COOLANT FLOWPATH WITH ENGINE RUNNING
- PURPLE DENOTES ENGINE LUBE OIL FLOWPATH WITH ENGINE RUNNING
- ORANGE DENOTES SOAKBACK PUMP FLOWPATH WITH ENGINE IN STANDBY OR RUNNING
- BROWN DENOTES AC TURBO OIL PUMP FLOWPATH

**LR NOTES:**

A. FOR GENERAL LICENSE RENEWAL NOTES REFER TO LR-M01-01.

LICENSE RENEWAL BOUNDARY DRAWING LR-OS41A1 REV. 1

SYSTEMS SHOWN ON THIS DRAWING:  
13: COMPONENT COOLING & DEMINERALIZED WATER STORAGE  
17: DIESELS

DAVIS-BESSE NUCLEAR POWER STATION UNIT NO 1

OPERATIONAL SCHEMATIC  
EMERGENCY DIESEL GENERATOR SYSTEMS

DRAWING NO OS-041A SH 1 REV 28

01D68