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 3/11/90

Vogtle Electric Generating Plant
 NUCLEAR OPERATIONS



Georgia Power

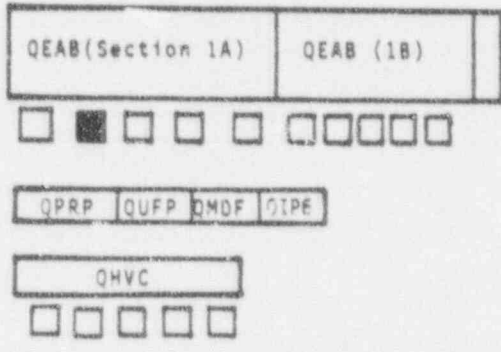
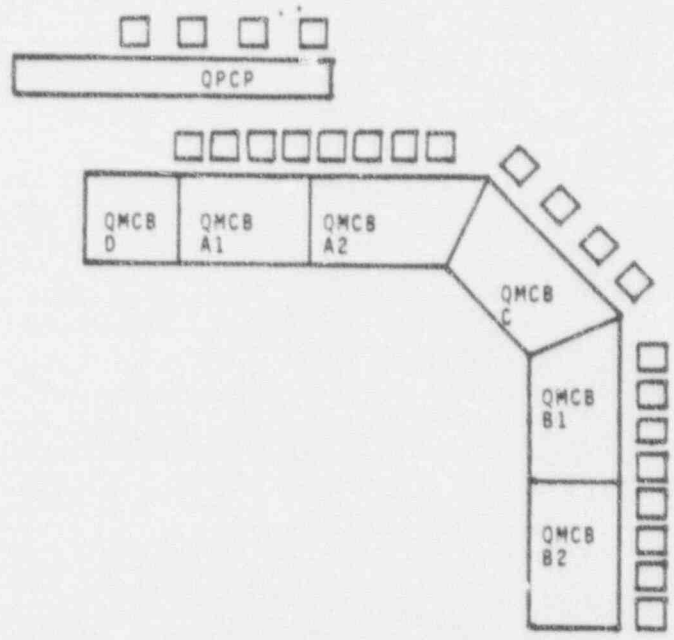
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05-57-90

ANNUNCIATOR RESPONSE PROCEDURES
FOR ALB 38 ON EAB PANEL

PURPOSE

These procedures describe alarm conditions annunciated on Annunciator Light Board (ALB) 38 located on the Electrical Auxiliary Board. They apply to Unit 1 operation only, to provide guidance for specific operator responses to given alarms and may not be appropriate for all plant conditions.



READ AND DESTROY

9202200305 920116
 PDR ADOCK 05000424
 S PDR

ALB 38

(1) (2) (3) (4) (5) (6) (7) (8) (9) (10)

A	DC18 LOW TEMP LUBE OIL-IN	DC18 LOW TEMP LUBE OIL-OUT	DC18 HI TEMP LUBE OIL-IN	DC18 HI TEMP LUBE OIL-OUT	DC18 TRIP HIGH TEMP LUBE OIL	DC18 LOW LEVEL LUBE OIL	DC18 TRIP HIGH TEMP ENGINE REC	DC18 TRIP HI CRANKCASE PRESS	DC18 VIBRATION TRIP	DC18 TRIP OVERSPEED
B	DC18 LOW PRESS LUBE OIL	DC18 TRIP LOW PRESS LUBE OIL	DC18 LOW PRESS TURBO OIL RIGHT	DC18 LOW PRESS TURBO OIL LEFT	DC18 TRIP LOW PRESS TURBO OIL	DC18 HI DIFF PRESS LUBE OIL FILTER	DC18 LOW OIL PRESS SENSOR MALFUNCTION	DC18 ENGINE CTRL POWER A FAILURE	DC18 ENGINE CTRL POWER B FAILURE	DC18 DISABLED GEN CONTROL PWR FAILURE
C	DC18 LOW TEMP JACKET WATER IN	DC18 LOW TEMP JACKET WATER OUT	DC18 HI TEMP JACKET WATER IN	DC18 HI TEMP JACKET WATER OUT	DC18 TRIP HI TEMP JACKET WATER	DC18 LOW PRESS JACKET WATER	DC18 TRIP LOW PRESS JACKET WATER	DC18 HI LEVEL JACKET WATER	DC18 HI JACKET WATER TEMP SENSOR MALF	DC18 DISABLED MOWBSET OF EMERGENCY TRIP
D	DC18 LOW PRESS FUEL OIL	DC18 HI DIFF PRESS FUEL OIL FILTER	DC18 FUEL OIL INJECTION LINE BREAK	DC18 HIGH LEVEL MAIN TANK	DC18 LOW LEVEL MAIN TANK	DC18 GEN USED FREQ	DC18 HIGH OR LOW LEVEL DAY TANK			DC18 DISABLED DC C&T BRKR IMOPERABLE
E	DC18 GENERATOR TROUBLE	DC18 LOW VOLTAGE	DC18 HIGH TEMP GEN CTRL PNL	DC18 LOW EXCITATION	DC18 DISABLED ENGINE CONTROL IN LOCAL	DC18 TRIP GENERATOR FAULT	DC18 TRIP GEN DIFF	DC18 HIGH TEMP GEN BEARINGS	DC18 LOCAL ANB PNL PWR FAILURE	DC18 DISABLED MAINTENANCE LOCK OUT
F	DC18 LOW PRESS CONTROL AIR	DC18 LOW PRESS STARTING AIR	DC18 HIGH PRESS STARTING AIR	DC18 DISABLED DC START POWER FAILURE	DC18 FAILED TO START	DC18 SWITCH NOT IN AUTO	DC18 RAISING DEVICE ENGAGED	DC18 PANFL INTRUSION	DC18 HI TEMP PANEL	DC18 EMERGENCY START

NOTE

The twelve annunciators denoted by an asterisk (*) are wired to provide a "First Alert" function at the local engine control panel PDG4 annunciators. The "First Alert" feature makes it possible to determine which of the twelve annunciators actuated first, should multiple alarm actuation occur. The first annunciator to actuate flashes fast and all subsequent annunciators flash slow.

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ORIGIN

1-TSHL-19159

SETPOINT

140°F

WINDOW A01

DG1B LOW TEMP LUBE OIL-IN

1.0

PROBABLE CAUSE

1. Lube Oil Temperature Control 1-TC-19157 or Heater Unit 1-2403-G4-002-H02 has malfunctioned.
2. Lube Oil Keep-Warm Pump has malfunctioned.
3. Low Temperature Lube Oil-In Temperature Switch 1-TSHL-19159 has malfunctioned.
4. If engine is in operation, large load reductions. (No action required.)

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

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WINDOW A01
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. CHECK for an associated alarm on DG1B LOW TEMP LUBE OIL-OUT.
2. DISPATCH an operator to:
 - a. ENSURE Keep-Warm Pump operating (if engine is in standby) and breaker at MCC 1NBO not tripped,
 - b. ENSURE Heater Unit Breaker at MCC 1NBO not tripped,
 - c. OBSERVE lube oil and jacket water temperatures.

CAUTION

Loss of the Keep-Warm Pump means loss of prelubrication to the main bearings and Turbocharger.

3. If the alarm was caused by failure of the Lube Oil Keep-Warm Pump:
 - a. DECLARE the Diesel Generator inoperable,
 - b. PLACE the engine controls in the MAINTENANCE mode, 1-HS-4578, to prevent the Diesel Generator from starting,
 - c. REFER to Technical Specification 3.8.1.1 or 3.8.1.2,
 - d. INITIATE maintenance to repair the pump.
4. INITIATE maintenance to return the Keep-Warm System to normal.
5. If Lube oil temperature drops to below 120°F START Diesel Generator 1B per 13145-1, "Diesel Generators", to maintain temperature above 120°F.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2, 1X3D-BH-G03N

ORIGIN

1-TSHL-19154

SETPOINT

140°F

WINDOW A02

DG1E LOW TEMP LUBE OIL-OUT

1.0

PROBABLE CAUSE

1. Lube Oil Temperature Control 1-TC-19157 or Heater Unit 1-2403-G4-002-H02 has malfunctioned.
2. Lube Oil Keep-Warm Pump has malfunctioned.
3. Low Temperature Lube Oil-Out Temperature Switch 1-TSHL-19154 has malfunctioned.
4. If engine is in operation, large load reductions (no action required).

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW A02
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. CHECK for an associated alarm on DG1B LOW TEMP LUBE OIL-IN.
2. DISPATCH an operator to:
 - a. ENSURE Keep-Warm Pump operating and (if engine is in standby) breaker at MCC 1NBO not tripped,
 - b. ENSURE Heater Unit Breaker at MCC 1NBO not tripped,
 - c. OBSERVE lube Oil and jacket water temperatures.

CAUTION

Loss of the Keep-Warm Pump means loss of prelubrication to the main bearings and Turbocharger.

3. If the alarm was caused by failure of the Lube Oil Keep-Warm Pump:
 - a. DECLARE the Diesel Generator inoperable,
 - b. PLACE the engine controls in the MAINTENANCE mode, 1-HS-4578, to prevent the Diesel Generator from starting,
 - c. REFER to Technical Specification 3.8.1.1 or 3.8.1.2,
 - d. INITIATE maintenance to repair the pump.
4. INITIATE maintenance to return the Keep-Warm System to normal.
5. If Lube oil temperature drops below 120°F START Diesel Generator 1B per 13145-1, "Diesel Generators", to maintain temperature above 120°F.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DF 0-2, 1X3D-BH-G03N

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ORIGINSETPOINT

WINDOW A03

1-TSHL-19159

175°F

DG1B HI TEMP
LUBE OIL-IN

1.0

PROBABLE CAUSENOTE

Alarm is functional only when engine is operating.

1. Inadequate coolant flow through Lube Oil Heat Exchanger.
2. Inadequate Nuclear Service Cooling Water (NSCW) flow through Jacket Water Heat Exchanger or high NSCW temperature.
3. Biofouling of NSCW side of the Jacket Water Heat Exchanger.
4. Engine overloaded.
5. The High Temperature Lube Oil-In Temperature Switch 1-TSHL-19159 has malfunctioned.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

- WINDOW A03
(Continued)

4.0 SUBSEQUENT OPERATOR ACTION

1. CHECK for associated alarms on:
 - a. DG1B HI TEMP JACKET WATER - IN,
 - b. DG1B HI TEMP LUBE OIL - OUT,
 - c. DG1B LOW PRESS TURBO OIL - RIGHT,
 - d. DG1B LOW PRESS TURBO OIL - LEFT,
 - e. DG1B LOW PRESS LUBE OIL.
2. REDUCE load on diesel, if possible UNLOAD and SHUT DOWN,
3. DISPATCH an operator to CHECK:
 - a. Turbo Oil Press - Right (Red) on 1-PI-19171,
 - b. Turbo Oil Press - Left (Black) on 1-PI-19171A,
 - c. Lube Oil Press on 1-PI-19177,
 - d. NSCW flow to Jacket Water Heat Exchanger.
4. DISPATCH an operator to monitor Lube Oil-Out and Jacket Water-In temperatures at Panel PDG4.
5. If alarm is due to high NSCW temperature, lower temperature by turning on additional Cooling Tower Fans.
6. UNLOAD and SHUT DOWN diesel prior to either temperature reaching 200°F, per 13145-1, "Diesel Generators".
7. If biofouling is suspected, INITIATE maintenance as required.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

SETPOINT

WINDOW A04

1-TSHL-19154

190°F

DG1B HI TEMP
LUBE OIL-OUT

1.0

PROBABLE CAUSE

NOTE

Alarm is functional only when engine is operating.

1. Inadequate jacket water flow through Lube Oil Heat Exchanger.
2. Inadequate Nuclear Service Cooling Water (NSCW) flow through Jacket Water Heat Exchanger.
3. Engine overloaded.
4. The High Temperature Lube Oil-Out Temperature Switch 1-TSHL-19154 has malfunctioned.

2.0

AUTOMATIC ACTIONS

NONE

NOTE

If running from a normal start, the diesel will shut down when the temperature reaches 200°F.

3.0

INITIAL OPERATOR ACTIONS

NONE

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WINDOW A04
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. CHECK for associated alarms on:
 - a. DG1B HI TEMP JACKET WATER-IN,
 - b. DG1B HI TEMP LUBE OIL - IN,
 - c. DG1B LOW PRESS TURBO OIL - RIGHT,
 - d. DG1B LOW PRESS TURBO OIL - LEFT,
 - e. DG1B LOW PRESS LUBE OIL.
2. REDUCE load on diesel, if possible UNLOAD and SHUT DOWN,
3. DISPATCH an operator to check:
 - a. Turbo Oil Press - Right (Red) 1-PI-19171,
 - b. Turbo Oil Press - Left (Black) 1-PI-19171A,
 - c. Lube Oil Press 1-PI-19177,
 - d. NSCW flow to Jacket Water Heat Exchanger.
4. MONITOR Lube Oil Out at setting LO OUT and Jacket Water-In at Panel PDG4.
5. UNLOAD and SHUT DOWN diesel prior to either temperature reaching 200°F, per 13145-1, "Diesel Generators".

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

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* WINDOW A05

ORIGINSETPOINT

1-TSH-4858

200°F

DG1B TRIP HIGH TEMP LUBE OIL

1.0

PROBABLE CAUSE

1. Inadequate water coolant flow through Lube Oil Heat Exchanger 1-3403-G4-002-E04.
2. Engine overloaded.
3. The Lube Oil-Out Temperature Switch 1-TSH-4858 has malfunctioned.

2.0

AUTOMATIC ACTIONS

Shutdown of diesel if operating from a Normal Start.

NOTE

Operating from an Emergency Start will only annunciate the alarm and will not trip the diesel.

3.0

INITIAL OPERATOR ACTIONS

NONE

*See Note on Page 3

WINDOW A05
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. If diesel has not tripped:
 - a. CHECK for an associated alarm on DG1B HI TEMP LUBE OIL-OUT,
 - b. If possible, REDUCE load on diesel.
2. If diesel has tripped, DISPATCH an operator to CHECK for:
 - a. Lube oil out temperature on Panel PDG4,
 - b. Proper operation of Lube Oil, Jacket Water and Nuclear Service Cooling Water Systems to the diesel.
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.
4. If equipment failure is indicated, INITIATE maintenance as required.
5. PREPARE Train B Diesel Generator for normal operation per 13145-1, "Diesel Generators".

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

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ORIGINSETPOINT

WINDOW A06

1-LSL-19093

26" above bottom
of tankDG1B LOW LEVEL
LUBE OIL

1.0

PROBABLE CAUSE

1. Normal usage while running engine.
2. Lube Oil Strainer in Lube Oil Sump Tank is clogged.
3. Leak in the Lube Oil System.
4. Lube Oil Sump Level Switch 1-LSL-19093 has malfunctioned.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW A06
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to:
 - a. CHECK that Oil Sump Dipstick has indication on dipstick if engine running or above "MIN STATIC" mark if engine not running,
 - b. If engine is in Standby and oil level is below "MIN STATIC", de-energize the Keep-Warm Heater,
 - c. CHECK Lube Oil Piping System for obvious leaks,
 - d. ADD oil per 13145-1, "Diesel Generators".

NOTES

- a. Alarm setpoint is such that if annunciator is received while engine is running there should be a sufficient quantity of lube oil in the sump to last through seven days of engine operation at full load.
 - b. When engine is running, any level indication on dipstick should be adequate to prevent pump cavitation.
 - c. When engine is running and oil level is above "MAX OPERATING", and alarm is actuated, the Lube Oil Strainer in the Lube Oil Sump Tank is probably clogged.
2. If oil level cannot be restored and maintained in the normal range, then UNLOAD and SHUT DOWN diesel.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

ITSH-4857 A, B,
C, D, E, F, G,
H, J, K

SETPOINT

228°F

* WINDOW A07

DG1B TRIP HIGH TEMP ENGINE BRG

1.0

PROBABLE CAUSE

1. High temperature lube oil. (See Sub-procedure A05.)
2. Failure of one or more of the ten main engine bearings.
3. Loss of lube oil pressure.
4. Engine overloaded.
5. One or more of the ten main engine bearing temperature monitors has malfunctioned.

2.0

AUTOMATIC ACTIONS

Shutdown of diesel if operating from a Normal Start.

NOTE

If operating from an Emergency Start this alarm will only annunciate, not trip the diesel.

3.0

INITIAL OPERATOR ACTIONS

NONE

* See Note on Page 3

WINDOW A07
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

CAUTION

If operation of engine is continued with a high temperature engine bearing, a crankcase explosion could occur.

1. If diesel has not tripped:
 - a. CHECK for an associated alarm on DGLB HI TEMP LUBE OIL-OUT,
 - b. UNLOAD and SHUT DOWN diesel as soon as possible per 13145-1, "Diesel Generators".
2. REFER to Technical Specifications 3.8 1.1 or 3.8.1.2.
3. DISPATCH an operator to:
 - a. CHECK Lube Oil-Out Temperature Indicator at Panel PDG4 for high temperature indication,
 - b. CHECK for proper operation of the Lube Oil System.
4. HAVE Maintenance personnel investigate for failure of a main engine bearing.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

* WINDOW A08

ORIGINSETPOINT

1-PSH-4842

3 psi of crankcase
press

DG1B TRIP HI CRANKCASE PRESS

1.0

PROBABLE CAUSE

1. Crankcase explosion, due to engine hot spot (i.e., main bearing.)
2. Excessive wear of piston and cylinder liners.
3. Crankcase Fans inoperable.
4. Crankcase Pressure Detector 1-PSH-4842 has malfunctioned.
5. Crankcase Vent line to atmosphere plugged.

2.0

AUTOMATIC ACTIONS

Shutdown of the diesel when operating from a Normal Start.

NOTE

Operating from an Emergency Start will only annunciate the alarm and will not trip the diesel.

3.0

INITIAL OPERATOR ACTIONS

NONE

* See Note on Page 3.

WINDOW A08
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

WARNING

OPERATING THE DIESEL WITH
A HIGH CRANKCASE PRESSURE
MAY CAUSE EXPLOSIVE GASES
TO ACCUMULATE IN THE DIESEL
GENERATOR ROOM.

1. If the diesel has not tripped UNLOAD and SHUT DOWN diesel as soon as possible per 13145-1, "Diesel Generators".
2. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.
3. DISPATCH an operator to.
 - a. VERIFY crankcase high pressure at the Crankcase Pressure Manometer 1-PI-19185 on the Engine Control Panel.
 - b. ENSURE breakers 1NY02-03 and -04 for crankcase fans are closed,

WARNING

DO NOT ALLOW REMOVAL OF ENGINE
COVERS FOR 15 MINUTES AFTER
ENGINE IS SHUT DOWN.

- c. Have Maintenance personnel investigate for possible crankcase explosion.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

* WINDOW A09

ORIGIN1XS-4855A,
-4855B, -4856A,
-4856BSETPOINTExcessive
VibrationDG1B VIBRATION
TRIP

1.0

PROBABLE CAUSE

1. Engine out of balance due to mechanical problems.
2. Turbocharger malfunction.
3. Turbocharger or engine vibration detectors have malfunctioned.

2.0

AUTOMATIC ACTIONS

Shutdown of the diesel when operating from a Normal Start.

NOTE

Operating from an Emergency Start will only annunciate the alarm and will not trip the diesel.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. If the engine has not tripped:
 - a. REDUCE load on the engine.
 - b. UNLOAD and SHUT DOWN diesel as soon as possible per 13145-1, "Diesel Generators".
2. DISPATCH an operator to check engine for unusual noises or vibrations.
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

* See Note on Page 3.

REFERENCES: AX4AK01-509, 1X4DB170-2

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ORIGINSETPOINT

* WINDOW A10

Overspeed
Governor

517.5 rpm

DGLB TRIP
OVERSPEED

1.0

PROBABLE CAUSE

1. Governor malfunction.
2. Loss of oil to governor.

2.0

AUTOMATIC ACTIONS

Diesel will shut down.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to investigate cause of alarm.
2. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.
3. RESET overspeed trip device when cause determined and corrected.
4. RESET emergency stop on PDG4.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

* See Note on Page 3.

REFERENCES: AX4AK01-509, 1X3D-BH-G03N

ORIGIN

1-PS-19177

SETPOINT

40 psi

WINDOW B01

DG1B LOW PRESS LUBE OIL

1.0

PROBABLE CAUSE

1. Lube Oil Filter clogged.
2. Lube Oil Strainer clogged.
3. Lube Oil Pressure Regulator(s) fail open.
4. Engine driven Lube Oil Pump malfunction.
5. Low Lube Oil Sump level.
6. Lube Oil Pressure Switch 1-PS-19177 malfunction.
7. Lube Oil Sump Tank Internal Strainer clogged.
8. High temperature in lube oil.

2.0

AUTOMATIC ACTIONS

NONE

NOTE

If pressure continues to decrease, the diesel will shut down at 30 psi.

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW 801
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

DISPATCH an operator to Panel PDG4 to:

- a. VERIFY low pressure at 1-PI-19177,
- b. VERIFY Lube Oil Out temperature between 160°F and 180°F,
- c. CHECK Lube Oil Sump level with dipstick and if necessary, ADD oil per 13145-1, "Diesel Generators",
- d. CHECK for an associated alarm on DG1B HI DIFF PRESS LUBE OIL FILTER and SHIFT filters, if necessary,
- e. CHECK Lube Oil Strainer differential pressure on 1-PDI-9093 or 9089 and SHIFT strainers, if necessary.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1PS-4859A,
-4859B,
-4859C

SETPOINT

30 psi

* WINDOW B02

DG1B TRIP LOW PRESS LUBE OIL

1.0

PROBABLE CAUSE

1. Lube Oil Filter clogged.
2. Lube Oil Strainer clogged.
3. Lube Oil Pressure Regulator(s) fail open.
4. Engine-driven Lube Oil Pump malfunction.
5. Low Lube Oil Sump level.
6. High temperature lube oil.

2.0

AUTOMATIC ACTIONS

Diesel shut down.

3.0

INITIAL OPERATOR ACTIONS

NONE

* See Note on Page 3.

WINDOW B02
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to Panel PDG4 to:
 - a. VERIFY Lube Oil Out temperature between 160°F and 180°F,
 - b. CHECK Lube Oil Sump level with dipstick and if necessary, ADD oil per 13145-1, "Diesel Generators",
 - c. CHECK for an associated alarm on DG1B HI DIFF PRESS LUBE OIL FILTER and SHIFT filters, if necessary,

NOTE

Diesel will not restart until
EMERGENCY STOP is RESET.

2. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2, FSAR Section 9.5.7.

ORIGIN

1-PS-19171

SETPOINT

20 psi

WINDOW B:

DG1B LOW PRESS TURBO OIL- RIGHT

1.0

PROBABLE CAUSE

1. Lube Oil Filter clogged.
2. Lube Oil Strainer clogged.
3. Lube Oil Pressure Regulator(s) fail open.
4. Engine-driven Lube Oil Pump malfunction.
5. Low Lube Oil sump level.
6. Right bank turbo Oil Pressure Switch 1-PS-19171 malfunction.
7. Turbocharger Prelube Valve 1-2403-U4-131 open.

2.0

AUTOMATIC ACTIONS

NONE

NOTE

When operating from a Normal Start, if the pressure decreases to 15 psi, the diesel will shut down.

3.0

INITIAL OPERATOR ACTIONS

NONE

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WINDOW B03
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to Panel PDG4 to:
 - a. VERIFY low pressure at gage 1-PI-19171 (Red pointer for right bank.),
 - b. VERIFY lube oil out temperature between 160°F and 180°F,
 - c. CHECK Lube Oil Sump level with dipstick and if necessary, ADD oil per 13145-1, "Diesel Generators",
 - d. CHECK for an associated alarm on DG1B HI DIFF PRESS LUBE OIL FILTER and SHIFT filters, if necessary,
 - e. CHECK Lube Oil Strainer differential pressure on 1-PDI-9093 or 9089 and SHIFT strainers, if necessary,
 - f. VERIFY that Turbocharger Prelube Valve 1-2403-U4-131 is CLOSED.
2. CHECK for an associated alarm on 5G1B LOW PRESS LUBE OIL.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

WINDOW B04

ORIGINSETPOINT

1-PS-19171A

20 psi

DG1B LOW PRESS
TURBO OIL-LEFT

1.0

PROBABLE CAUSE

1. Lube Oil Filter clogged.
2. Lube Oil Strainer clogged.
3. Lube Oil Pressure Regulator(s) fail open.
4. Engine-driven Lube Oil Pump malfunction.
5. Low Lube Oil sump level.
6. Left Bank Turbo Oil Pressure Switch 1-PS-19171A malfunction.
7. Turbocharger Prelube Valve 1-2403-U4-131 open.

2.0

AUTOMATIC ACTIONS

NONE

NOTE

When operating from a Normal Start, if the pressure decreases to 15 psi, the diesel will shut down.

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW 804
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to Panel PDG4 to:
 - a. VERIFY low pressure at gage 1-PI-19171A (Black pointer for left bank.),
 - b. VERIFY Lube Oil Out temperature between 160°F and 180°F,
 - c. CHECK Lube Oil Sump level with dipstick and if necessary, ADD oil per 13145-1, "Diesel Generators",
 - d. CHECK for an associated alarm on DG1B HI DIFF PRESS LUBE OIL FILTER and SHIFT filters if necessary,
 - e. CHECK Lube Oil Strainer differential pressure on 1-PDI-9093 or 9089 and SHIFT strainers, if necessary,
 - f. ENSURE that Turbocharger Prelube Valve 1-2403-U4-131 is CLOSED.
2. CHECK for an associated alarm on DG1B LOW PRESS LUBE OIL.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

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ORIGINSETPOINT

* WINDOW B05

1-PS-4859D, or
1-PS-4859E

15 psi

DG1B TRIP LOW PRESS TURBO OIL

1.0

PROBABLE CAUSE

1. Left or right bank turbo:

- a. Lube Oil Filter clogged,
- b. Lube Oil Strainer clogged,
- c. Lube Oil Pressure Regulator(s) fail open,
- d. Engine-driven Lube Oil Pump malfunction,
- e. Low Lube Oil Sump level,
- f. Turbocharger Prelube Valve 1-2403-U4-131 open.

2. Either the right bank Turbo Oil Pressure Switch 1-PS-4859D or the left bank pressure switch 1-PS-4859E malfunction.

2.0

AUTOMATIC ACTIONS

Shutdown of diesel if operating from a Normal Start.

NOTE

Operating from an Emergency Start will only annunciate the alarm and will not trip the diesel.

3.0

INITIAL OPERATOR ACTIONS

NONE

* See Note on Page 3.

WINDOW B05
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. If possible, TRIP or REDUCE load on diesel.
2. If diesel has not tripped, CHECK for an associated alarm on DG1B LOW PRESS TURBO OIL-RIGHT or DG1B LOW PRESS TURBO OIL-LEFT.
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.
4. DISPATCH an operator to Panel PDG4 to:
 - a. VERIFY Lube Oil Out temperature between 160°F and 180°F,
 - b. CHECK Lube Oil Sump level with dipstick and if necessary, ADD oil per 13145-1, "Diesel Generators",
 - c. ENSURE Turbocharger Prelube Valve 1-2403-U4-131 CLOSED.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

WINDOW B06

ORIGIN

1-PDS-19179

SETPOINT

20 psi

DG1B HI DIFF PRESS LUBE OIL FILTER
--

1.0

PROBABLE CAUSE

1. In-service filter clogged.
2. Lube Oil Differential Pressure Switch 1-PDS-19179 malfunction.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

DISPATCH an operator to verify high pressure on 1-PDI-19099 on Diesel Generator 1B and on 1-PDI-19179 on Panel PDG4 and SHIFT filters as necessary per 13145-1, "Diesel Generators".

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

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ORIGIN1PS-4859A,
4859B,
4859CSETPOINT

Not Applicable

WINDOW B07

DG1B LOW OIL PRESS SENSOR MALFUNCTION

1.0

PROBABLE CAUSE

1. Oil leak or air leak in pressure sensors.
2. Failure of pressure sensor device.
3. One sensor has tripped and a second trip is imminent.

2.0

AUTOMATIC ACTIONS

NONE

NOTE

If one other sensor should trip,
the diesel will trip.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to check Lube Oil Pressure Gage 1-PI-19177 on Panel PDG4.
2. If lube oil pressure is below 30 psi, SHUT DOWN the diesel per 13145-1, "Diesel Generators".
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1AX4DB170-2

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ORIGINPS-31N3
Panel PDG4SETPOINT

Loss of voltage

WINDOW B08

DG1B ENGINE
CNTL POWER
A FAILURE

1.0

PROBABLE CAUSE

1. Breaker 1BD11-11 at Panel 1BD11 is tripped.
2. Breakers CB1-2 (ganged) right front of Panel PDG4 tripped.
3. Loss of control air pressure.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to ensure breaker 1BD11-11 CLOSED.
2. DISPATCH an operator to ensure breakers CB1-2 (ganged) on PDG4 CLOSED and Control Air System pressure.

NOTE

Annunciators driven by optical isolator do not function:

- a. DG1B DISABLED DG CKT BRKR INOPERABLE,
- b. DG1B GEN UNDER FREQ,
- c. DG1B GENERATOR TROUBLE,
- d. DG1B LOW VOLTAGE,
- e. DG1B HIGH TEMP GEN CNTL PNL,
- f. DG1B LOW EXCITATION,
- g. DG1B DISABLED ENGINE CONTROL IN LOCAL,
- h. DG1B TRIP GENERATOR FAULT,
- i. DG1B TRIP GEN DIFF,
- j. DG1B DISABLED GEN CONTROL PWR FAILURE,
- k. DG1B DISABLED NONRESET OF EMERGENCY TRIP,
- l. Fuel Oil Transfer Pump input to DG1B SWITCH NOT IN AUTO.

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WINDOW B08
(Continued)5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X4DB170-2, 1X3D-BH-G03M

ORIGIN

PS-31N4
Panel PDG4

SETPOINT

Loss of voltage

WINDOW B09

DG1B ENGINE
CNTL POWER
B FAILURE

1.0 PROBABLE CAUSE

1. Breaker 1BD12-11 at Panel 1BD12 is tripped.
2. Breakers CB3-4 (ganged) left front of Panel PDG4 tripped.
3. Loss of control air pressure.

2.0 AUTOMATIC ACTIONS

NONE

3.0 INITIAL OPERATOR ACTIONS

NONE

4.0 SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to ensure breaker 1BD12-11 CLOSED.
2. DISPATCH an operator to ensure breakers CB3-4 (ganged) on PDG4 CLOSED and Control Air System pressure normal.
3. DG1B stop logic is no longer operable. Engine must be stopped locally with PUSH-TO-STOP/PULL-TO-RUN switch on engine skid or by manually actuating the overspeed trip device.

CAUTION

Engine should not be started with B Control Power de-energized. All Electrical Trips and remote stopping capabilities have been lost.

4. If problem cannot be corrected:
 - a. DECLARE the Diesel Generator inopeable,
 - b. REFER to Technical Specification 3.8.1.1 or 3.8.1.2.

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WINDOW B09
(Continued)

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X4DB170-2, 1X3D-BH-G03P, 1X3D-BH-G03Q

ORIGIN

Relay 74
Panel PDG3

SETPOINT

Loss of Voltage

WINDOW B10

DGIB DISABLED
GEN CONTROL
PWR FAILURE

1.0

PROBABLE CAUSE

1. Breaker 1BD11-06 at Panel 1BD11 is tripped.
2. Breaker in Panel PDG3 right bay tripped.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONSNOTE

If engine is operating in Parallel mode, the Unit/Parallel Relay will deenergize taking the governor and Voltage Regulator out of the droop mode causing loss of load control which may result in engine overload or reverse power.

If load begins to change uncontrollably in Parallel mode, TRIP Output Breaker 1BA03-19 and SHUT DOWN per 13145-1, "Diesel Generators".

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WINDOW B10
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to ensure breaker 1BD11-06 CLOSED.
2. DISPATCH an operator to ensure breaker in Panel PDG3 CLOSED.

NOTES

- a. If engine is running protective relaying is no longer operable, speed and voltage cannot be adjusted using the Control Switches.
- b. If engine is in standby generator field flash is inoperable.
3. If problem cannot be corrected:
 - a. DECLARE the Diesel Generator inoperable.
 - b. REFER to Technical Specification 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-564, 1X3D-BH-G03T

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ORIGINSETPOINT

WINDOW C01

1-TSHL-19122

140°F

DG1B LOW TEMP JACKET WATER- IN

1.0

PROBABLE CAUSE

1. Jacket Water Standpipe Temperature Control 1-TC-19123 or heater unit 1-2403-G4-002-H01 has malfunctioned.
2. Jacket Water Keep-Warm Pump has malfunctioned.
3. Jacket Water Main Header Inlet Temperature Switch TSHL-19122 has malfunctioned.
4. If engine is in operation, large load reductions (no action required).

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

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WINDOW C01
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. CHECK for an associated alarm on DG1B LOW TEMP JACKET WATER-OUT.
2. DISPATCH an operator to check:
 - a. Temperatures by setting the Thermocouple Selector Switch to JW IN and JW OUT,
 - b. Keep-warm pump operating and breaker at MCC 1NBO not tripped,
 - c. Heater Unit Breaker at MCC 1NBO not tripped.
3. INITIATE maintenance to return the Keep-Warm System to normal.
4. If jacket water temperature drops to below 120°F START Diesel Generator 1B per 13145-1, "Diesel Generators" to maintain temperature above 120°F.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

WINDOW C02

ORIGIN

1-TSHL-19120

SETPOINT

140°F

DG1B LOW TEMP JACKET WATER- OUT

1.0

PROBABLE CAUSE

1. Jacket Water Temperature Control 1-TC-19123 or Heater Unit 1-2403-G4-002-H01 has malfunctioned.
2. Jacket Water Keep-Warm Pump has malfunctioned.
3. Jacket Water Main Header Outlet Temperature Switch 1-TSHL-19120 has malfunctioned.
4. If engine is in operation, large load reductions (no action required).

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW C02
(Continued)

4.0

SUBSEQUENT OPERATOR ACTIONS

1. CHECK for an associated alarm on DG1B LOW TEMP JACKET WATER-IN.
2. DISPATCH an operator to check:
 - a. Temperatures by setting the Thermocouple Selector Switch to JW IN and JW OUT,
 - b. Keep-warm pump operating and breaker at MCC 1NBO is not tripped,
 - c. Heater Unit Breaker at MCC 1NBO not tripped.
3. INITIATE maintenance to return the Keep-Warm System to normal.
4. If jacket water temperature drops to below 120°F START Diesel Generator 1B per 13145-1, "Diesel Generators" to maintain temperature above 120°F.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1-TSHL-19122

SETPOINT

175°F

WINDOW C03

DG1B HI TEMP JACKET WATER- IN

1.0

PROBABLE CAUSE

NOTE

Alarm is functional only when engine is operating.

1. Three-way Mixing Valve 1-TCV-19097 to Jacket Water Cooler has failed in the bypass position.
2. Engine-driven Jacket Water Pump malfunction.
3. Insufficient Nuclear Service Cooling Water (NSCW) flow through Jacket Water Cooler or NSCW high temperature.
4. Engine overloaded.
5. Jacket Water Main Header Inlet Temperature Switch TSHL-19122 has malfunctioned.
6. Biofouling of NSCW side of the Jacket Water Cooler.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW C03
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. CHECK for an associated alarm on DG1B HI TEMP JACKET WATER-OUT.
2. REDUCE load on engine, if possible.
3. DISPATCH an operator to verify high temperature at Jacket Water Cooler JW IN and JW OUT.
4. ENSURE at least two Train B NSCW Pumps are running and START additional NSCW Cooling Tower Fans if necessary.
5. MONITOR temperatures on the Thermocouple Selector Switch to JW IN and JW OUT.
6. UNLOAD and SHUT DOWN diesel, per 13145-1, "Diesel Generators", prior to either temperature reaching 200°F.
7. If biofouling is suspected, INITIATE maintenance as required.
8. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1-TSHL-19120

SETPOINT

190°F

WINDOW C04

DG1B HI TEMP JACKET WATER- OUT

1.0

PROBABLE CAUSENOTE

Alarm is functional only when engine is operating.

1. Three-way Mixing Valve 1-TCV-19097 to Jacket Water Cooler has failed in the bypass position.
2. Engine-driven Jacket Water Pump malfunction.
3. Insufficient Nuclear Service Cooling Water (NSCW) flow through Jacket Water Cooler or NSCW high temperature.
4. Engine overloaded.
5. Jacket Water Main Header Outlet Temperature Switch TSHL-19120 has malfunctioned.

2.0

AUTOMATIC ACTIONS

NONE

NOTE

If jacket water temperature continues to rise, the diesel will shut down at 200°F.

3.0

INITIAL OPERATOR ACTIONS

NONE

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WINDOW C04
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. CHECK for an associated alarm on DG1B HI TEMP JACKET WATER-IN.
2. REDUCE load on engine, if possible.
3. DISPATCH an operator to verify high temperature at Jacket Water Cooler JW OUT and JW IN.
4. ENSURE at least two Train B NSCW Pumps are running and START additional NSCW Cooling Tower Fans if necessary.
5. UNLOAD and SHUT DOWN diesel, per 13145-1, "Diesel Generators", prior to either temperature reaching 200°F.
6. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGINSETPOINT

* WINDOW C05

Two out of three
temperature
detectors in
jacket water
outlet header:
1-TSH-19117,
1-TSH-19118,
1-TSH-19119

200°F

DG1B TRIP HI TEMP JACKET WATER

1.0

PROBABLE CAUSE

1. Three-way Mixing Valve 1-TCV-19097 to Jacket Water Cooler has failed in the bypass position.
2. Engine-driven Jacket Water Pump malfunction.
3. Insufficient Nuclear Service Cooling Water flow through Jacket Water Cooler.
4. Engine overloaded.

2.0

AUTOMATIC ACTIONS

Diesel will shut down.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to investigate the cause of the trip.

NOTE

Diesel can not be restarted
until EMERGENCY STOP is RESET.

2. REFER to Technical Specifications 3.8.1.1 or 3.8.i.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

* See Note on Page 3.

REFERENCES: AX4AK01-509, LX4DB170-2, FSAR Section 9.5.5

ORIGIN

1-PS-19173

SETPOINT

8 psi

* WINDOW C06

DGIB LOW PRESS JACKET WATER

1.0

PROBABLE CAUSE

1. Engine-driven Jacket Water Pump malfunction.
2. Leak in the Jacket Water System.
3. Water Jacket Pressure Switch 1-PS-19173 has malfunctioned.

2.0

AUTOMATIC ACTIONS

When operating from a Normal Start, if the pressure decreases to 6 psi, the diesel will shut down.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to:
 - a. VERIFY low pressure below 8 psi at Panel PDG4 on 1-PI-19173,
 - b. VERIFY Jacket Water Pump pressure at Gage 1-PI-19135 to be above 10 psi.
2. If Jacket Water Pump failure is indicated, SHUT DOWN the Diesel Generator.
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

* See Note on Page 3.

REFERENCES: AX4AK01-509, 1X4DB170-2

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* WINDOW C07

ORIGINSETPOINT

1-PS-4859F

6 psi

DG1B TRIP LOW PRESS JACKET WATER
--

1.0

PROBABLE CAUSE

1. Engine-driven Jacket Water Pump malfunction.
2. Leak in the Jacket Water System.
3. Low level in the Jacket Water Standpipe.
4. Jacket Water Pressure Detector 1-PS-4859F has malfunctioned.

2.0

AUTOMATIC ACTIONS

Shutdown of diesel if operating from a Normal Start.

NOTE

When operating from an
Emergency Start will only
annunciate the alarm and
will not trip the diesel.

3.0

INITIAL OPERATOR ACTIONS

If the Diesel Generator has not tripped, then TRIP it.

4.0

SUBSEQUENT OPERATOR ACTIONS

Refer to Technical Specifications 3.8.1.1 or 3.8.1.2

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

* See Note on Page 3.

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1-LSL-19095

SETPOINT31" Above
centerline
of JW Return
Header

WINDOW C08

DG1B LOW LEVEL
JACKET WATER

1.0

PROBABLE CAUSE

1. Leak in Jacket Water System.
2. Water Jacket Level Switch 1-LSL-19095 has malfunctioned.
3. Drain Valve 1-2403-X4-715 open.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to:
 - a. VERIFY low level using 1-LI-5742,
 - b. FILL the standpipe through valve 1-2403-U4-713 to normal level,
 - c. MONITOR level after filling for indications of a leak in the system,
 - d. CHECK piping system for leaks.
2. If water was added, HAVE Chemistry Department personnel sample jacket water and TREAT as necessary.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1-TSH-19117
 1-TSH-19118
 1-TSH-19119

SETPOINT

Not Applicable

WINDOW C09

DG1B HI JACKET
 WATER TEMP
 SENSOR MALF

1.0

PROBABLE CAUSE

1. Control air signal leak.
2. Failure of a jacket water temperature sensor.
3. One sensor has tripped and a second trip is imminent.

2.0

AUTOMATIC ACTIONS

NONE

NOTE

If one other sensor should trip,
 the diesel will trip.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to check JW OUT temperature, on Temperature Indicator on Panel PDG4.
2. If jacket water temperature is above 200°F, SHUT DOWN the diesel per 13145-1, "Diesel Generators".
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509

ORIGIN

Relay R23B
in Panel
PDG4

SETPOINT

Not Applicable

WINDOW C10

DG1B DISABLED
NONRESET OF
EMERGENCY TRIP

1.0

PROBABLE CAUSE

Relay R23 has latched following an emergency stop signal due to one of the following:

- a. Local EMERGENCY STOP Pushbutton 1-HS-4568A,
- b. Control Room EMERGENCY STOP Pushbuttons 1-HS-4568B and 1-HS-4568C,
- c. Engine Overspeed,
- d. Lockout Relay 186A, Generator Differential,
- e. High Temperature Jacket Water during emergency start,
- f. Low Pressure Lube oil during emergency start.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONSNOTE

Engine will not restart until
EMERGENCY STOP is RESET.

1. ENSURE that the cause of the emergency trip has been corrected.
2. DISPATCH an operator to Panel PDG4 to depress the EMERGENCY STOP RESET button 1-HS-4582.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4AK01-42

ORIGIN

1-PS-19183

SETPOINT

20 psi

WINDOW D01

DG1B LOW PRESS
FUEL OIL

1.0

PROBABLE CAUSE

1. Fuel Oil Filter clogged.
2. Fuel Oil Strainer clogged.
3. Pressure Regulating Valve 1-PSV-9083 failed open.
4. Engine-driven Fuel Oil Pump malfunction.
5. Low level in Fuel Oil Day Tank.
6. Pipe break in Fuel Oil System.
7. Fuel Oil Pressure Switch 1-PS-19183 malfunction.
8. Fuel Oil Day Tank to Engine Isolation Valve 1-2403-U4-032 closed.
9. Fuel Oil Pressure Switch 1-PS-19183 Root Valve 1-2403-X4-720 closed.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

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WINDOW D01
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. CHECK for sufficient level in Fuel Oil Day Tank on 1-LIT-9019 on QEAB.
2. DISPATCH an operator to:
 - a. VERIFY low pressure at gage 1-PI-19183 on Panel PDG4,
 - b. CHECK for an associated alarm on DGLB HI DIFF PRESS FUEL OIL FILTER and SHIFT filters, if necessary,
 - c. CHECK Duplex Fuel Strainer Gage 1-PDI-19103 and SHIFT strainers, if necessary,
 - d. CHECK Fuel Oil System piping for leaks,
 - e. ENSURE Fuel Oil Day Tank to Engine Isolation valve 1-2403-U4-032 OPEN,
 - f. ENSURE 1-PI-19183 root valve 720 OPEN,

NOTE

If engine-driven Fuel Oil Pump coupling is not rotating, the overspeed governor may be inoperable since they are both driven by the accessory drive assembly.

- g. ENSURE engine-driven Fuel Oil Pump coupling rotating.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1-PDS-19181

SETPOINT

20 psid

WINDOW D02

DG1B HI DIFF PRESS FUEL OIL FILTER
--

1.0

PROBABLE CAUSE

1. In-service filter fouled.
2. Fuel Oil Filter Differential Pressure Switch 1-PDS-19181 malfunctioned.
3. Fuel Oil Filter Differential Pressure Switch 1-PDS-19181 Root Valve 1-2403-X4-720 closed.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to verify high pressure at PDI-19181 on Panel PDG4 and 1-PDI-9085 and SHIFT filters, if necessary per 13145-1, "Diesel Generators".
2. ENSURE 1-PDS-19181 root valve 1-2403-X4-720 OPEN.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

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ORIGINSETPOINT

WINDOW D03

LSH-4894

High Level

DG1B FUEL OIL INJECTION LINE BREAK
--

1.0

PROBABLE CAUSE

1. One or more of the high pressure fuel oil injection lines between the individual cylinder fuel pumps and injectors has a fitting leak or has burst. (These lines are shrouded and if the fitting leaks or the inner tube bursts, the fuel oil is routed to a collection tank on the east side of the engine).
2. Malfunction of Shrouded Fuel Oil Line Leakage Tank Level Switch LSH-4894.

2.0

AUTOMATIC ACTION

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW D03
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. REDUCE load on Diesel Generator if possible.
2. DISPATCH operator to verify that the Shrouded Fuel Oil Line Leakage Tank has fuel oil in it by removing the threaded cap from the top.

NOTE

The injection line which is leaking fuel oil may be detected by feeling each of the leak-off lines between the bottom of the injection line (near injection pump) and the leak-off holder. The line(s) which is leaking will be hotter than those not leaking.

3. Visually INSPECT all sixteen fuel injection lines on the cylinder heads to attempt to determine which injection line has failed.
4. If injection line has failed, REDUCE load and STOP Diesel Generator if not running due to emergency start.
5. If injection line failure is indicated, INITIATE maintenance as required.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1-LIS-9023

SETPOINT

95% - 78,500
gallons

WINDOW D04

DG1B
HIGH LEVEL
MAIN TANK

1.0

PROBABLE CAUSE

1. Filling of the DFO Storage Tanks.
2. Malfunction of DFO Storage Tank Level Indicating Switch 1-LIS-9023.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. VERIFY high level of DFO Storage Tank at gage 1-LI-9025 on QEAB.
2. STOP filling of DFO Storage Tank.

5.0

COMPENSATORY OPERATOR ACTIONS

1. During filling or transferring operations, periodically MONITOR DFO Storage Tank level.
2. LOG corrective actions to repair the disabled annunciator or reasons for no action on 10018-C, "Annunciator Control", Figure 2.
3. LOG compensatory actions on 10018-C, "Annunciator Control", Figure 5.

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2, 1X5DT0030

WINDOW D05

ORIGIN

1-LIS-9023

SETPOINT76% - 68,000
gallonsDG1B
LOW LEVEL
MAIN TANK

1.0

PROBABLE CAUSE

1. Normal usage of fuel oil.
2. Leak in DFO Storage Tank.
3. DFO Storage Tank Level Switch 1-LIS-9023 malfunction.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. VERIFY low level in DFO Storage Tank at gage 1-LI-9025 on QEAB.
2. DISPATCH an operator to verify low fuel oil level at the local Level Indicator 1-LIS-9023 or 1-LI-9025A.
3. MAKE arrangements to have fuel oil delivered by a designated supplier.
4. If necessary, TRANSFER fuel from DG1A or a Unit 2 DFO Storage Tank per 13146-1, "Diesel Generator Fuel Oil Transfer System".
5. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

WINDOW D05
(Continued)

5.0

COMPENSATORY OPERATOR ACTIONS

1. CHECK DFO Storage Tank level once per shift (hourly during Diesel runs) and INITIATE Subsequent Operator Actions if the above setpoint is reached.
2. LOG corrective actions to repair the disabled annunciator or reasonse for no action on 10018-C, "Annunciator Control", Figure 2.
3. LOG compensatory actions on 10018-C, "Annunciator Control", Figure 5.

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2, 1X5DT0030

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WINDOW D06

ORIGINSETPOINTUnderfrequency
Relay 181X

59.5 Hz

DG1B GEN
UNDER FREQ

1.0

PROBABLE CAUSE

1. Diesel Generator in Parallel Operation:
Grid frequency has dropped below 59.5 Hz.
2. Diesel Generator in Isolated Operation:
 - a. Diesel Generator starting,
 - b. Diesel Generator stopping,
 - c. Sequencing of loads on bus 1BA03
causing momentary underfrequency,
 - d. Diesel Generator overloaded.
3. Instrument failure.

2.0

AUTOMATIC ACTIONS

1. Diesel Generator in Parallel Operation:
Diesel Generator output breaker
1BA03-19 trips.
2. Diesel Generator in Isolated Operation:
NONE

3.0

INITIAL OPERATOR ACTION

NONE

WINDOW D06
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. Diesel Generator in Parallel Operation:
 - a. CHECK bus frequency, if less than or equal to 59.5 Hz ENSURE Diesel Generator Breaker 1BA03-19 has tripped,
 - b. STOP Diesel Generator.
2. Diesel Generator in Isolated Operation:
 - a. CHECK DG1B frequency on QEAB and ADJUST frequency to 60Hz with SPEED CONTROL Switch 1-HS-4519B on QEAB, if required,
 - b. ENSURE load does not exceed 7000 kW and REMOVE non-essential loads, if necessary.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X3D-BH-G03T, 1X3D-BA-D03D

ORIGIN

1-LSHL-9019

SETPOINT

90% High - 1230
gallons
55% Low - 680
gallons

WINDOW D07

DG1B
HIGH OR LOW
LEVEL DAY TANK

1.0

PROBABLE CAUSE

1. Manual operation of DFO Storage Tank Pump to Recycle Day Tank fuel back to the storage tank.
2. Failure of DFO Storage Tank Pumps to start or stop.
3. DFO Storage Tank Pump Discharge Basket Strainer clogged.
4. Day Tank Level Switch 1-LSHL-9019 malfunction.
5. Leak in Fuel Oil Piping System.
6. DFO Storage Tank empty.
7. Valves misaligned.

2.0

AUTOMATIC ACTIONS

1. None if high level.
2. Starts second DFO Storage Tank Pump if low level.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. ENSURE DFO Storage Tank Pumps 3 and 4 Control Switches HS-9045 and HS-9047 on QEAB are in AUTO.
2. CHECK for high or low on 1-LI-9019 on QEAB.
3. START or STOP standby DFO Storage Tank Pumps at 1-HS-9047 and/or 1-HS-9045 on QEAB, as necessary.

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WINDOW D07
(Continued)

4. DISPATCH an operator to CHECK DFO Storage Tank Pump discharge gauges to determine condition of strainers and to look for leaks.
5. ENSURE valves 1-2403-U4-051, 054 and 041 are LOCKED OPEN and 040 is LOCKED CLOSED.
6. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

1. During Diesel Generator operation, CHECK Day Tank level hourly and INITIATE Subsequent Operator Actions if Day Tank level reaches the low setpoint.
2. LOG corrective actions to repair the disabled annunciator or reasons for no action on 10018-C, "Annunciator Control", Figure 2.
3. LOG compensatory actions on 10018-C, "Annunciator Control", Figure 5.

END OF SUB-PROCEDURE

REFERENCES: 1X4DB170-2, 1X3D-BH-G02B, 1X5DT0036

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ORIGINSETPOINT

WINDOW D10

198 Relay
at Breaker
1BA0319

Not Applicable

DG1B DISABLED
DG CKT BRKR
INOPERABLE

1.0

PROBABLE CAUSE

1. 1-HS-1BA0319 on Panel QEAB in pull-to-lock.
2. Diesel Generator Breaker Control Select Switch 1-HS-1BA0319B on 1BA03 Switchgear in LOCAL.
3. Breaker 1BA0319 not racked in.
4. Loss of DC Control power at breaker 1BA0319.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

- WINDOW D10
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. RESTORE 1-HS-1BA0319 to AUTO.
2. DISPATCH an operator to 1BA03 switchgear:
 - a. ENSURE 1-HS-1BA0319B in CONTROL ROOM,
 - b. ENSURE breaker in the racked in position,
 - c. ENSURE DC control power ON.
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X3D-AA-K01A, 1X3D-BA-D03D

ORIGINSETPOINT

WINDOW E01

One or more of
the following:

Not Applicable

DG1B
GENERATOR
TROUBLE

- a. 132X - Reverse Power Relay,
- b. 140X - Loss of field,
- c. 146X - Negative Phase Sequence,
- d. 151V/AX - Voltage Restrained OC - Phase A,
- e. 151V/BX - Voltage Restrained OC - Phase B,
- f. 151V/CX - Voltage Restrained OC - Phase C,
- g. 151NX - Neutral Ground Time Overcurrent,
- h. 159X - Overvoltage,
- i. 160X - PT Failure,
- j. 160/XB, PT failure,
- k. 164X - Field Ground
- l. 181X - Underfrequency
- m. 127X - Undervoltage

1.0

PROBABLE CAUSE

- 1. Trouble with generator of DG1B.
- 2. Instrument failure.

WINDOW E01
(Continued)

2.0 AUTOMATIC ACTIONS

1. For trouble sensed by b, d, e, f and g sensors listed, DG1B breaker trips and DG1B shuts down except when running from an emergency start.
2. During an emergency start from the break glass station the breaker will trip and DG continue to run. During an SI condition the breaker will not trip and engine continue to run.
3. For trouble sensed by a and c sensors listed, DG1B breaker trips if DG1B parallel with offsite feeder, except when running in an SI condition.

3.0 INITIAL OPERATOR ACTIONS

NONE

4.0 SUBSEQUENT OPERATOR ACTIONS

1. If possible, SHUT DOWN DG1B.
2. DISPATCH an operator to determine the trouble with DG1B.
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X3D-BH-G03N, 1X3D-BH-G03T, 1X3D-AA-K01A

WINDOW E02

ORIGINSETPOINT

127X Undervoltage 3780 VAC

DG1B
LOW VOLTAGE

1.0

PROBABLE CAUSE

1. Low generator output voltage
2. Malfunction of sensors.
3. Voltage Regulator malfunction.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. INCREASE generator voltage.
2. DISPATCH an operator to check local instrumentation at Panel PDG3 and determine the cause.
3. TRANSFER Voltage Regulator to MAN and ADJUST voltage to obtain 4160V if not in parallel or the correct VAR loading if paralleled to the grid.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X3D-BH-G03T, 1X3D-BA-D03D, 1X3D-AA-K01A,
1X3D-AA-H02B

ORIGIN

1-TS-4884

SETPOINT

122°F

WINDOW E03

DG1B HIGH TEMP GEN CNTL PNL

1.0

PROBABLE CAUSENOTE

Alarm is functional only
when engine is operating.

1. Overheating of exciter components in the Generator Control Panel.
2. High temperature in Diesel Generator Room.
3. Loss of HVAC.
4. Malfunction of High Temperature Switch 1-TS-4884.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW E03
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. If a fire is suspected:
 - a. OBSERVE the Fire Monitor Panel for possible alarms,
 - b. If a fire is indicated, REFER to 92005-C, "Fire Response Procedure".
2. If a fire is not indicated, DISPATCH an operator to:
 - a. CHECK for high temperature in Diesel Generator Room,
 - b. CHECK Generator Control Panel for cause of high temperature,
 - c. ENSURE Generator Control Panel is adequately ventilated,
 - d. ENSURE Diesel Generator Room is adequately ventilated.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X3D-BH-G03T, 1X3D-BH-G03M

ORIGIN

Minimum
Excitation
Limiter

SETPOINT

Not Applicable

WINDOW E04

DG1B LOW
EXCITATION

1.0

PROBABLE CAUSE

1. Malfunction of the Exciter Regulator.
2. Generator is being operated with an excessive leading power factor.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. If generator is being operated in parallel, INCREASE reactive power to indicate positive Var loading, by going to RAISE with Voltage Control Switch.
2. REFER to 13427-1, "4160V AC 1E Electrical Distribution System" for reactive loading guidelines.
3. If generator fails to develop adequate output voltage during startup on a loss of offsite power, TRANSFER the generator to the redundant bridge per 13145-1, "Diesel Generator," Step 4.4.8.
4. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-565, 1X3D-BH-G03T, 1X3D-AA-K01A

ORIGIN

1-HS-4517

SETPOINT

Not Applicable

WINDOW E05

DG1B DISABLED
ENGINE CONTROL
IN LOCAL

1.0

PROBABLE CAUSE

The LOCAL/REMOTE 1-HS-4517 Switch, at Panel PDG3 placed in LOCAL position.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. If alarm not expected, NOTIFY Unit Shift Supervisor and DISPATCH an operator to:
 - a. VERIFY, at Panel PDG3 that 1-HS-4517 is in LOCAL,
 - b. DETERMINE reason for LOCAL position (e.g., the diesel is in the MAINTENANCE mode).
2. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X3D-BH-G03T,

ORIGIN

Aux Trip LORS
186B or 186C

SETPOINT

Not Applicable

WINDOW E06

DG1B TRIP
GENERATOR
FAULT

1.0

PROBABLE CAUSE

1. Reverse Power Relay 132.
2. Negative Phase Sequence Relay 146.
3. Neutral Ground-Time Overcurrent 151N.
4. Loss of Field Relay 140.
5. Overcurrent with Voltage Restraint Relay 151V (3).
6. Test.
7. Instrument malfunction.

2.0

AUTOMATIC ACTIONS

1. Probable cause 1 and 2 will trip breaker if DG1B is parallel with offsite feeder.
2. Probable cause 3, 4 and 5 will trip breaker and shutdown diesel if operating from a normal start.

NOTE

If operating from a Safety Injection Train B Emergency Start, will only annunciate the alarm and will not trip the diesel.

3.0

INITIAL OPERATOR ACTIONS

NONE

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WINDOW E06
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to determine the trouble with Diesel Generator 1B.
2. Prior to resetting Lockout Relay 186B or 186C:
 - a. OBSERVE which protective relay has a flag displayed,
 - b. DEPRESS the Target Reset Pushbutton on PDG3,
 - c. RESET the flag on the protective relay which was actuated,

CAUTION

Never hold a Lockout Relay in the Reset position. To reset, take handle to Reset and quickly release. If relay does not remain in the Reset position, reperform Steps a. thru c. above. Failure to follow these steps could result in relay coil damage.

- d. RESET Lockout Relay 186B or 186C.
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X3D-BA-D03D, 1X3D-BH-G03N, 1X3D-BH-G03T,
1X3D-AA-K01A

ORIGIN

Aux Trip
LOR 186A

SETPOINT

Not Applicable

* WINDOW E07

DG1B TRIP
GEN DIFF

1.0

PROBABLE CAUSE

One or more of three 187 differential relays sensing differential current.

2.0

AUTOMATIC ACTIONS

1. Diesel Breaker 1BA0319 trips.
2. Diesel shutdown.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.
2. DISPATCH an operator to determine the cause of the trip of DG1B.
3. Prior to resetting Lockout Relay 186A:
 - a. OBSERVE which differential relay(s) has a flag displayed,
 - b. DEPRESS the Target Reset Pushbutton on PDG3,
 - c. RESET the flag on the protective relay which was actuated,

CAUTION

Never hold a Lockout Relay in the Reset position. To reset, take handle to Reset and quickly release. If relay does not remain in the Reset position, reperform Steps a. thru c. above. Failure to follow these steps could result in relay coil damage.

- d. RESET Lockout Relay 186A.

* WINDOW E07
(Continued)

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

* See Note on Page 3.

REFERENCES: 1X3D-BH-G03N, 1X3D-AA-K01A, 1X3D-BA-D03D
 1X3D-BH-G03T

ORIGIN

1TS-4883

SETPOINT

180°F

WINDOW E08

DG1B
HIGH TEMP
GEN BEARINGS

1.0

PROBABLE CAUSE

1. Low oil level in Generator Pedestal Bearing.
2. Failure of Diesel Generator bearing.
3. Malfunction of bearing temperature sensor.
4. Loss of power to 1-TS-4883.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to check pedestal bearing oil temperature at gage 1TI-4531 and oil level to be visible in the sight glass.
2. If pedestal bearing oil temperature is high or level is low, SHUT DOWN diesel per 13145-1, "Diesel Generators", as soon as possible.
3. ENSURE breaker 1NY1N-13 closed.
4. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-564, 1X3D-BH-G03H

ORIGIN

Relay R37
PDG4

SETPOINT

Loss of Voltage

WINDOW E09

DG1B LOCAL ANN PNL PWR FAILURE

1.0

PROBABLE CAUSE

1. Breaker 1ND32-11 at Panel 1ND32 is tripped.
2. Breaker CB9/10 at Panel PDG4 is tripped.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

NOTE

Local annunciator panel is de-energized making all Control Room alarms inoperable.

1. DISPATCH operator to breaker 1ND32-11 to verify CLOSED.
2. DISPATCH operator to breaker CB9/10 inside Panel PDG4 to verify CLOSED and VERIFY annunciator power supply in bottom of panel is in the ON position.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-564, 1X3D-BH-G03P

ORIGIN

Maintenance
pushbutton on
Engine Control
Panel.

SETPOINT

Not Applicable

WINDOW E10

DG1B DISABLED
MAINTENANCE
LOCK OUT

1.0

PROBABLE CAUSE

1. Diesel engine is in Maintenance mode.
2. Malfunction in Electric-Pneumatic Control System.

2.0

AUTOMATIC ACTIONS

Shuts down fuel rack and prevents starting of Diesel Generator.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. If alarm not expected NOTIFY Unit Shift Supervisor and:
 - a. VERIFY that maintenance is being performed on diesel,
 - b. CHECK for an associated alarm on DG1B BARRING DEVICE ENGAGED,
 - c. If maintenance is not being performed on diesel DETERMINE reason for maintenance lock-out.
2. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X3D-BH-G03N

ORIGIN

1-PSL-19175

SETPOINT

55 psi

WINDOW F01

DG1B LOW PRESS CONTROL AIR

1.0

PROBABLE CAUSE

1. Failure of control air pressure regulator.
2. Leak in Control Air System.
3. Starting Air System pressure less than 55 psi.
4. Starting air isolated from engine.
5. Control Air Pressure Switch 1-PSL-19175 has malfunctioned.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. CHECK for an associated alarm on DG1B LOW PRESS STARTING AIR.
2. DISPATCH an operator to:
 - a. VERIFY low control air pressure at gage 1-PI-19175 on Panel PDG4,
 - b. INVESTIGATE cause of low air pressure and RESTORE as soon as possible.
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1-PSL-9053, or
1-PSL-9057

SETPOINT

215 psi

WINDOW F02

DG18
LOW PRESS
STARTING AIR

1.0

PROBABLE CAUSE

1. Air Start Compressor 1-2403-G4-002-C02 or C01 failed to start.
2. Leak in Starting Air System.
3. Compressor Drain Trap 1-2403-G4-002, 203, or 204 failed to close.
4. Pressure Relief Valve 1-PSV-9037, 9039, 4893, 4894, 9033 or 9029 actuated.
5. Momentary pressure reduction due to engine start.
6. Malfunction of Starting Air Pressure Switch 1-PSL-9053 or 9057.
7. Starting Air Receiver Isolation Valves 1-2403-U4-722 or 729 CLOSED.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

WINDOW F02
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to:
 - a. CHECK Starting Air Pressure at 1-PI-9053 and 1-PI-9057 on Panel PDG4 to determine the system that is affected,
 - b. CHECK local gages 1-PI-9061 and 9065 for starting air pressure, and COMPARE readings with the ones on Panel PDG4,
 - c. ENSURE at least one bank of the Starting Air System is above 210 psi or REFER to Technical Specifications 3.8.1.1 or 3.8.1.2,
 - d. INVESTIGATE cause of low starting air pressure and RESTORE as soon as possible,
 - e. ENSURE starting Air Compressor Breakers on MCC 1NBO are CLOSED,
 - f. ENSURE that Air Receiver Isolation Valves 722 and 729 are OPEN.

5.0 COMPENSATORY OPERATOR ACTIONS

1. CHECK receiver pressure and ENSURE at least one receiver is above 210 psig at least once every two hours.
2. LOG corrective actions to repair the disabled annunciator or reasons for no action on 10018-C, "Annunciator Control", Figure 2.
3. LOG compensatory actions on 10018-C, "Annunciator Control", Figure 5.

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGIN

1-PSH-9053,
1-PSH-9057

SETPOINT

260 psi

WINDOW F03

DG1B HIGH
PRESS STARTING
AIR

1.0

PROBABLE CAUSE

1. Failure of Pressure Switch 1-PSL-9079 or 1-PSL-9081 to stop its air compressor.
2. Malfunction of Starting Air Pressure Switch 1-PSH-9053 or 9057.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

DISPATCH an operator to:

- a. CHECK Starting Air Pressure Gage 1-PI-9053 and 9057 on Panel PDG4 or Local Gages 1-PI-9061 and 9065 to determine the system affected,
- b. DE-ENERGIZE Starting Air Compressors at MCC 1NBO if necessary,
- c. DEPRESSURIZE the affected Air Start Receiver if necessary to reset the alarm.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X4DB170-2

ORIGINPSH-4823
(PS-31N2)SETPOINT

Not Applicable

WINDOW F04

DG1B DISABLED DC START POWER FAILURE
--

1.0

PROBABLE CAUSE

1. 125V DC is not available from breakers 1BD11-11 or 1BD12-11.
2. Loss of control air pressure.
3. Malfunction of DC Power Control Air Solenoid Actuated Two-Position Valve 202-6A or 202-6B.
4. Malfunction of DC Power Pressure Switch PS-31N2.
5. Local breakers CB1/2 and CB3/4 open at PDG4.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. DISPATCH an operator to check Panel PDG4 for indications of DC power trouble and breakers CB1/2 and CB3/4.
2. CHECK for an associated alarm DG1B LOW PRESS CONTROL AIR.
3. DISPATCH an operator to check breakers 1BD11-11 and 1BD12-11 are CLOSED.
4. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X3D-BH-G03N, 1X3D-3H-G03P,
1X4AK01-45, 1X3D-BH-G03M

ORIGIN

R-36 Relay which is energized if generator has not reached 200 rpm within 5 seconds of start signal

SETPOINT

Not Applicable

* WINDOW F05

DG1B FAILED TO START

1.0

PROBABLE CAUSE

1. Malfunction of Fuel Oil System.
2. Malfunction of Starting Air System.
3. Malfunction in Electro-Pneumatic Control System.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

* See Note on Page 3.

WINDOW F05
(Continued)

4.0 SUBSEQUENT OPERATOR ACTIONS

NOTE

Alarm does not prevent
diesel from starting.

1. If the engine starts and continues to run, PRESS the Start Pushbutton 1-MS-4570B to reset the Keep-Warm System, stopping the pumps and reinstating alarms that are bypassed during shutdown.
2. NOTIFY Plant Engineering Services.
3. DISPATCH an operator to check for proper operation and line up of Fuel Oil and Starting Air Systems.
4. CORRECT any malfunctions or improper lineups.
5. RESET alarm and ATTEMPT to restart engine, per 13145-1, "Diesel Generators", after cause of alarm has been corrected.
6. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0 COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X3D-BH-G03P

ORIGIN

One or more of
the following
switches:

- a. 1-HS-9045 Fuel
Oil Transfer
Pump 003,
- b. 1-HS-9047 Fuel
Oil Transfer
Pump 004,
- c. After cooler
No. 1,
- d. Air Compressor
No. 1,
- e. After cooler
No. 2,
- f. Air Compressor
No. 2,
- g. Lube Oil Keep
Warm Pump,
- h. Lube Oil Keep
Warm Heater,
- i. Jacket Water
Keep Warm
Pump,
- j. Jacket Water
Keep Warm
Heater,
- k. Generator Space
Heater

SETPOINT

Switch is OFF

WINDOW F06

DG1B SWITCH
NOT IN AUTO

1.0 PROBABLE CAUSE

One of the above handswitches is OFF.

2.0 AUTOMATIC ACTIONS

NONE

3.0 INITIATE OPERATOR ACTIONS

NONE

WINDOW F06
(Continued)

4.0

SUBSEQUENT OPERATOR ACTIONS

1. If alarm not expected NOTIFY Unit Shift Supervisor and:
 - a. DETERMINE cause of any switches out of position,
 - b. VERIFY no tag-outs or maintenance being done on affected system.
2. RETURN switches to AUTO.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X3D-BH-G03Q

ORIGIN

PSH-4810
(PS-13N)

SETPOINT

Not Applicable

WINDOW F07

DG1B BARRING
DEVICE ENGAGED

1.0

PROBABLE CAUSE

Barring Device Lockout Pin has been removed to allow turning of engine.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. If alarm not expected, NOTIFY Unit Shift Supervisor and DETERMINE cause.
2. REINSTALL Lockout Pin in barring device in order to place engine in OPERATIONAL Mode per 13145-1, "Diesel Generators".
3. REFER to Technical Specifications 3.8.1.1 or 3.8.1.2.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X3D-BH-G03N

ORIGIN

PDG4 Engine
Control Panel
Door Switch

SETPOINT

Not Applicable

WINDOW F08

DG1B PANEL
INTRUSION

1.0

PROBABLE CAUSE

1. One of the Engine Control Panel doors is open.
2. Malfunction of one of the Control Panel door switches.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

If no maintenance is being performed on Diesel Generator 1B, DISPATCH an operator to:

- a. VERIFY position of the Engine Control Panel doors.
- b. CLOSE any Control Panel door that is not open for maintenance.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: AX4AK01-509, 1X3D-BH-G03Q

ORIGIN

1TS-4882

SETPOINT

130°F

WINDOW F09

DGLB HI TEMP
PANEL

.0

PROBABLE CAUSE

1. Overheating of control circuitry in Engine Control Panel.
2. High temperature in Diesel Generator Room.
3. Malfunction of Temperature Switch 1TS-4882.

2.0

AUTOMATIC ACTIONS

NONE

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. If a fire is suspected:
 - a. CHECK the Fire Monitor Panel for possible alarms,
 - b. If a fire is indicated, REFER to 92005-C, "Fire Response Procedure".
2. If a fire is not indicated, DISPATCH an operator to:
 - a. CHECK for high temperature in Diesel Generator Room,
 - b. CHECK Engine Control Panel for cause of high temperature,
 - c. ENSURE Engine Control Panel is adequately ventilated,
 - d. ENSURE Diesel Generator Room is adequately ventilated,
 - e. ENSURE Control Panel interior light is OFF.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF SUB-PROCEDURE

REFERENCES: 1X3D-BH-G03Q

ORIGINPSH-4835
(PS-10N1)SETPOINT

Not Applicable

WINDOW F10

DGLB EMERGENCY
START

1.0

PROBABLE CAUSE

1. Diesel has started from a Safety Injection Actuation Signal.
2. Diesel has started from actuation of a local Emergency Start.

2.0

AUTOMATIC ACTIONS

NONE

NOTE

Only low pressure lube oil, high jacket water temperature, engine overspeed and generator differential will trip the diesel.

3.0

INITIAL OPERATOR ACTIONS

NONE

4.0

SUBSEQUENT OPERATOR ACTIONS

1. VERIFY the blue ready to load light energizes.
2. DISPATCH an operator to verify the Diesel Generator is operating properly.

5.0

COMPENSATORY OPERATOR ACTIONS

NONE

END OF PROCEDURE TEXT

REFERENCES: AX4AK01-509, 1X3D-BH-G03Q
1X4AK01-44