

50-424/425-OLA-3

5/16/95

S-33

Staff Exh. II-33

Approval <i>JLash</i>	DOCKETED USNRC Vogtle Electric Generating Plant NUCLEAR OPERATIONS	Procedure No 14980-1
Date 2-5-90	95 JUN -6 P12:20 Unit 1	Revision No 18
	Georgia Power	Page No 1 of 31

OFFICE OF SECRETARY
DOCKETING & SERVICE
BRANCH

VOID

DIESEL GENERATOR OPERABILITY TEST

1.0 PURPOSE

1.1 This surveillance procedure is used to demonstrate the operability of the Emergency Diesel Generators. This procedure should not be used for maintenance troubleshooting or testing.

1.2 This surveillance satisfies these Technical Specification Requirements:

4.8.1.1.2.a
4.8.1.1.2.b
4.8.1.1.2.g

1.3 The frequency of this test is given by Technical Specification Table 4.8-1.

2.0 APPLICABILITY

2.1 This surveillance is applicable in Modes 1, 2, 3 and 4.

2.2 Portions of this surveillance are applicable in Modes 5 and 6.

3.0 PRECAUTIONS AND LIMITATIONS

3.1 The Unit Shift Supervisor (USS) shall be notified immediately if a subsystem or component malfunctions or test data indicate a potential problem during a surveillance test.

3.2 The rated capacity of a Diesel Generator is 7000 kW. Load should not be permitted to exceed this limit during testing. The Diesel Generator should not be operated at less than 30% load (2100 kW) for prolonged periods of time.

3.3 During Diesel Generator load testing, loads in excess of 7000 kW or momentary variations due to changing bus loads shall not invalidate the test.

9506290336 950516
PDR ADOCK 05000424
G PDR

EXHIBIT B

9506290336

EXHIBIT

DOCKETED
JUN 10 1995

25 JUN - 8 PM 130

DOCKETED
JUN 10 1995

Staff IDENTIFIED
Applicant RECEIVED
Interviewer REJECTED
Contg Offr
Contractor DATE 5-16-95
Other Witness Cash
Reporter C. Ziner

In the matter of
Docket No. 30-424-0013
Official Exh. No. 56-H II-33

NUCLEAR REGULATORY COMMISSION

- 2.4 If during a Diesel Engine start the Fail To Start alarm comes in but the engine keeps running, the support systems will operate as if the engine was shut down. To reset these systems the START pushbutton must be pressed. This will stop the Keep Warm Pumps, turn off the Keep Warm Heaters, stop the Crankcase Fans and place the alarms in service that are bypassed when shut down.
- 3.5 Once initiated, the Diesel Generator shutdown signals remain in effect for 90 seconds. During this period, the Diesel Generator will only respond to an emergency start signal. To prevent the depletion of starting air, wait until the local red stopping light is OFF (approximately 90 seconds) after a normal stop before attempting to start the diesel.
- 3.6 All start attempts, including those from bona fide start signals, shall be logged in the USS and/or the Control Room logbook. The log entry shall include the following information:
- a. Start time,
 - b. Reason for start,
 - c. Success or failure of the start attempt.
- 3.7 The Emergency Diesel Generators shall not be used for peaking service.
- 3.8 Diesel generator surveillance tests shall be initiated only from the Control Room.
- 3.9 During surveillance testing, only one Diesel Generator shall be paralleled at a time to the off-site power source.
- 3.10 The Diesel Generator has been aligned for standby per 13145-1, "Diesel Generators" and a current copy of 11145-1, "Diesel Generator Alignment" and 11146-1, "Diesel Generator Fuel Oil Transfer System Alignment" are on file.
- 3.11 If any unusual grid disturbances occur while the Diesel Generator is operating, start the Fault Recorder in the Control Room and notify the System Engineer for an evaluation of the problem.
- 3.12 Testing of a Diesel Generator for troubleshooting (i.e., first engine run following major maintenance, etc.) should be performed using 13145-1, "Diesel Generators". If necessary, testing for operability should follow using this procedure.

INITIALS

- 3.13 A cylinder moisture check shall not be performed if in an action statement of Technical Specification 3.8.1.1 or 3.8.1.2.

4.0 PREREQUISITES OR INITIAL CONDITIONS

- 4.1 The USS shall ensure this surveillance test does not affect other tests presently in progress or jeopardize plant operation prior to granting approval to perform this surveillance test.

USS APPROVAL

- 4.2 OBTAIN the following test equipment:

- a. Two stop watches

No. 1 serial number _____

No. 2 serial number _____

- b. A clear container 1 liter size or larger.

- 4.3 NOTIFY the System Operator and the Unit 2 Control Room of the Diesel Generator Test.

- 4.4 The NSCW System is in service to provide cooling water to the Diesel Generator Jacket Water Heat Exchangers.

INITIALS

5.0

INSTRUCTIONS

TEST STARTED

DATE

TIME

MODE

Diesel Generator Being Tested

NOTE

Once begun, the appropriate portions of this procedure should be completed if possible and the system, subsystem or component returned to service or committed to repair as required.

5.1

DIESEL GENERATOR STARTUPNOTE

Prior to performing the six month surveillance, the diesel should remain in standby for several hours to allow temperatures to stabilize.

5.1.1

If this test is being performed as the six-month (184 day) surveillance per Technical Specifications 4.8.1.1.2.g VERIFY the Diesel Generator has been shutdown for more than 4 hours.

NOTE

While the Diesel Generator is in operation check for rubbing or excessive vibration of small diameter tubing supporting Diesel Generator operation, e.g., fuel lines, instrument tubing, or instrument air tubing.

5.1.2

STATION an operator in the Diesel Generator Building to monitor the Diesel Generator operation and maintain headset or radio communication with the Control Room throughout the duration of the test.

INITIALS**CAUTION**

The cylinder moisture check shall not be performed if this test is performed as an action item of Technical Specification 3.8.1.1 for 3.8.1.2.

- 5.1.3 If it has not been performed within the preceding 4 hours, **PERFORM** a Cylinder Moisture Check per 13145-1 "Diesel Generators".
- 5.1.4 **RECORD** the Diesel Generator pre-startup readings on Section A of 11885-C "Diesel Generator Operating Log".
- 5.1.5 **RECORD** the Engine Hours on Data Sheet 1.
- 5.1.6 **TEST** the annunciator lights at the alarm panel at PDG2 (PDG4) and **VERIFY** that all annunciator lights are operable.
- 5.1.7 If this test is performed as the regular monthly surveillance, **ALIGN** the starting air system as follows:
- 5.1.7.1 If the month is January, April, July or October, **UNLOCK** and **CLOSE** the Air Start Receiver 1 Discharge Isolation 1-2403-U4-765(722).
- 5.1.7.2 If the month is February, May, August or November, **UNLOCK** and **CLOSE** the Air Start Receiver 2 Discharge Isolation 1-2403-U4-769(729).
- 5.1.7.3 **RECORD** the valve which was closed on Data Sheet 1. If both valves were left open, **RECORD** "Both Valves Open" on Data Sheet 1.

INITIALS

CAUTION

The Turbo Lube Oil Orifice Bypass Valve should be opened (Step 5.1.8) 12 minutes prior to diesel start, and should be promptly closed (Step 5.1.12) after the start. Steps 5.1.8 through 5.1.12 should be performed expeditiously. Excess prelubrication may result in oil accumulation in the exhaust piping and an exhaust fire upon engine start.

- 5.1.8 OPEN the Turbo Lube Oil Orifice Bypass Valve 1-2403-U43130 (131).
- 5.1.9 PLACE the DSL GEN 1A (1B) VM SW Switch to A-B.
- 5.1.10 When starting the Diesel Generator, TIME the following:
 - 5.1.10.1 The time from depressing the Diesel Generator START Pushbutton until voltage reaches 4025 to 4330 volts.
 - 5.1.10.2 The time from depressing the Diesel Generator START Pushbutton until frequency reaches 58.8 to 61.2 Hz.

NOTES

- a. While the diesel engine is starting the operator in the Diesel Room should listen for the escape of air from the Starting Air Manifold Vent to verify the manifold vent is open and unobstructed.
- b. When the Diesel Generator is started in the next step, the Generator Trouble Alarm may annunciate due to a spurious Generator Field Ground relay actuation. This is a normal startup alarm and relay.

- 5.1.11 At Panel QEAR, DEPRESS the DIESEL GENERATOR START Pushbutton.

VEGP

14980-1

18

7 of 31

INITIALS

- 5.1.12 CLOSE the Turbo Lube Oil Orifice Bypass Valve 1-2403-U4-130(131)
- 5.1.13 RECORD the time to voltage and frequency on Data Sheet 1.
- 5.1.14 RECORD the Diesel Generator voltage and frequency on Data Sheet 1.
- 5.1.15 If the Generator Field Ground relay flag is visible, then PERFORM the following at Generator Control Panel PDG1 (PDG3):
- RESET the DG1A (DG1B) Generator Field Ground relay flag by placing the Generator Field Ground Relay Test Switch to the RESET position.
 - DEPRESS the Relay Target Reset Pushbutton.
- 5.1.16 LOCK OPEN the Air Start Receiver Discharge Isolation which was closed in Step 5.1.7.
- 5.1.17 If the Diesel Generator is to be paralleled to the 4160V AC bus, PROCEED to Subsection 5.2.
- 5.1.18 If the Diesel Generator is to be shut down, immediately PROCEED to Subsection 5.3.

INITIALS

5.2 DIESEL GENERATOR LOADING

CAUTION

If the Diesel Generator is being operated in the Parallel mode, never transfer the LOCAL-REMOTE Switch (1-HS-4516) (4517) on PDG1 (3) to LOCAL as this will take governor and voltage regulator out of the droop mode.

NOTE

If this test is to perform the 6 month surveillance, then the Diesel Generator should not be allowed to idle prior to paralleling and loading.

5.2.1 If this test is not performed as the six month surveillance, then IDLE the diesel for 5-10 minutes until temperatures stabilize.

5.2.2 ENSURE the Diesel Generator 1A(1B) SYNC MODE SELECTOR Switch TS-DG1A (DG1B) is in AUTO.

CAUTION

Never place two sync-switches to the ON position at the same time. A blown PT fuse may result.

5.2.3 PLACE the breaker 1AA0219 (1BA0319) Synchronization Switch to ON.

5.2.4 Momentarily PLACE the DSL GEN 1A(1B) UNIT/PARALLEL Switch 1HS-4414B (HS-4452B) to PARALLEL and OBSERVE the red DSL GEN 1A(1B) DROOP MODE light is on.

INITIALS

- 5.2.5 OBSERVE 4160V Bus 1AA02 (1BA03) voltage on the QEAB RUNNING Voltmeter via BUS 1AA02 NORM INCM VM SW (BUS 1BA03 NORM INCM VM SW) and Diesel Generator 1A(1B) voltage on the QEAB INCOMING Voltmeter via DSL GEN A VM SW (DSL GEN 1B MV SW).
- 5.2.6 VERIFY that the Sync Scope Meter is rotating and that the Synchronizing Lights are bright at the 6 o'clock position and dark at the 12 o'clock position and that the SYNC PERMISSIVE red light comes on near the 12 o'clock position.
- 5.2.7 ADJUST generator voltage as necessary to slightly lead the bus voltage (Generator voltage less than 50V above the lowest phase of bus voltage).
- 5.2.8 While observing the Sync Scope, ADJUST the generator speed until the Sync Scope needle is rotating slowly in the clockwise (FAST) direction (8 to 10 seconds rotation).
- 5.2.9 If this surveillance is being performed as the regularly monthly test, or as an action item of Technical Specification 3.8.1.1, PERFORM Step 5.2.11 and MARK Step 5.2.12 as N/A.
- 5.2.10 If this surveillance is being performed as the six-month (184 day) test per Technical Specification 4.8.1.1.2.g, PERFORM Step 5.2.12 and MARK Step 5.2.11 as N/A.
- 5.2.11 PARALLEL the Diesel Generator to the bus.
- 5.2.11.1 When the Sync Scope needle reaches the 11 o'clock position, DEPRESS and HOLD the Diesel Generator 1A(1B) AUTO SYNC PERMISSIVE Pushbutton PB-DG1A (PB-DG1B).
- 5.2.11.2 When the DG1A (DG1B) OUTPUT BRKR 1AA0219 (1BA0319) closes, RELEASE the Auto Sync Permissive Pushbutton.

INITIALS

NOTE

To perform the six-month test, the Diesel Generator load must be raised to greater than 6100 kW within 60 seconds of closing the Diesel Generator Output Breaker.

- 5.2.12 Parallel the Diesel Generator to the bus.
- 5.2.12.1 When paralleling the Diesel Generator, TIME the interval from closing the Diesel Generator Output Breaker until load exceeds 6100 kW.
- 5.2.12.2 When the Sync Scope needle reaches the 11 o'clock position, DEPRESS and HOLD the Diesel Generator 1A(1B) AUTO SYNC PERMISSIVE Pushbutton PB-DG1A (PB-DG1B).
- 5.2.12.3 When the DG1A (DG1B) OUTPUT BRKR 1AA0219 (1AB0319) closes, RELEASE the Auto Sync Permissive Pushbutton.
- 5.2.12.4 RAISE generator load to 6100-7000 KW.
- 5.2.12.5 RECORD the time required to raise Diesel Generator load above 6100 kW on Data Sheet 1.

NOTES

- a. When not performing the six-month test, the Generator should be step loaded in increments of approximately 1000 kW and 500 kVAR with 3 - 4 minutes between load changes.
- b. As the generator voltage is adjusted, the kVAR should be maintained positive and no more than half of the kW load.

- 5.2.13 PLACE the breaker 1AA0219 (1BA0319) Synchronization Switch to OFF.

INITIALS

5.2.14 ADJUST generator load to 6800-7000kW.

5.2.15 ADJUST generator voltage to maintain generator kVARS between 2500 and 3000 OUT.

5.2.16 RECORD the time at which Diesel Generator load exceeded 6800kW on Data Sheet 1.

5.2.17 When the Diesel Generator has been loaded for 30 minutes, INITIATE 11885-C, "Diesel Generator Operating Log."

NOTE

Subsection 5.4, Fuel Oil Transfer Pump Testing and 5.5, Air Compressor Test, may be completed during the Diesel Generator loaded run if desired.

5.2.18 While the diesel is loaded EXAMINE the following and NOTE any problems.

5.2.18.1 Generator Sliprings and Brushes.

5.2.18.2 Generator Bearing Oil Rings.

5.2.18.3 Jacket Water System.

5.2.18.4 Lube Oil System.

5.2.18.5 Fuel Oil System.

5.2.18.6 Diesel engine intake and exhaust piping.

5.2.18.7 Combustion Air Header Drains (4). One valve at each end of both manifolds.

INITIALSNOTES

- a. As generator load is adjusted, generator voltage should be adjusted concurrently to maintain kVAR load OUT (positive) and no more than one-half of the kW load.
- b. The Generator should be unloaded in increments of approximately 1000 kW and 500 kVAR with 3-4 minutes between load changes.

5.2.19 When the Diesel Generator has been loaded to greater than 6800 kW for at least 1 hour

5.2.19.1 RECORD the time load was reduced to less than 6800 kW on Data Sheet 17

5.2.19.2 REDUCE Diesel Generator load to 100-200 kW and 50-100 kVAR

5.2.19.3 TRIP the DG1A (DG1B) OUTPUT BRKR 1AA0219 (1BA0319)

5.2.19.4 IDLE the Diesel Generator unloaded for 4-5 minutes

5.2.20 SHUT DOWN the Diesel Generator per Subsection 5.3

INITIALS

5.3 DIESEL GENERATOR SHUTDOWN

CAUTION

If an SI signal is received during engine coastdown, monitor lube oil pressure and trip the Diesel Generator if pressure falls below the trip setpoint of 30 psi.

5.3.1 At Panel QEAB, DEPRESS the DIESEL GENERATOR 1A(1B) STOP Pushbutton 1-HS-4571B (4572B).

5.3.2 RECORD the time the Diesel Generator was shut down on Data Sheet 1.

5.3.3 At 480V AC MCC 1NBT (1NBO), VERIFY the Generator Space Heater is energized.

5.3.4 VERIFY the Jacket Water Keep-Warm Pump starts.

5.3.5 VERIFY the Lube Oil Keep-Warm Pump starts.

5.3.6 After approximately two minutes, VERIFY the red stopping light at Panel PDG2 (PDG4) is off.

INITIALS

5.3.7

If after approximately 2 minutes, the red STOPPING light is NOT off, RESET as follows:

NOTE

Handswitch is found on the front of the engine auxiliary skid.

- a. PLACE the pushbutton 1-HS-4688 (4689), DGLA (DGLB) RUN/STOP, in the PUSH-TO-STOP position for approximately 10 seconds,
- b. PLACE the pushbutton 1-HS-4688 (4689), DGLA (DGLB) RUN/STOP, in the PULL-TO-RUN position,
- c. VERIFY the red STOPPING light is off, and the blue UNIT AVAILABLE light is ON.

5.3.8

RECORD the engine hours on Data Sheet 1.

5.3.9

ALIGN the Diesel Generator Building HVAC System for automatic operation per 13325-1, "Auxiliary Feedwater Pumphouse And Diesel Generator Building HVAC Systems".

INITIALS

NOTE

Accumulated water must be drained from the Fuel Oil Day Tank per Technical Specification 4.8.1.1.2.b.

5.3.10 If this test was performed as a regular monthly surveillance test or, if the Diesel Generator was operated for a period of one hour or greater, SAMPLE the Diesel Generator Diesel Fuel Oil (DFO) Day Tank for water:

5.3.10.1 OBTAIN a clear container one liter size or larger.

5.3.10.2 DRAIN a small amount of fuel oil into the container from the Day Tank Drain 1-2403-U4-035(036).

5.3.10.3 EXAMINE the sample for water on the bottom of the container.

5.3.10.4 If water detected, REPEAT the sample until no water is found.

5.3.10.5 CLOSE, LOCK and CAP the Day Tank Drain Valve 1-2403-U4-035(036).

5.3.10.6 DIESEL GENERATOR FUEL OIL TRANSFER SYSTEM TEST

NOTE

This section of the procedure will verify the operability of the Diesel Generator Fuel Oil Transfer Pumps.

5.4.1 START the DFO STOR TANK PUMP-1 (-3), 1-HS-9044(9045).

5.4.2 VERIFY the pump starts and transfers fuel oil to the DFO Day Tank.

5.4.3 STOP the DFO STOR TANK PUMP-1 (-3), 1-HS-9044(9045).

5.4.4 START the DFO STOR TANK PUMP-2 (-4), 1-HS-9046(9047).

INITIALS

- 5.4.5 VERIFY the pump starts and transfers fuel oil to the DFO Day Tank. _____
- 5.4.6 STOP the DFO STOR TANK PUMP-2 (-4), 1-HS-9046(9047). _____
- 5.5 DIESEL GENERATOR AIR START COMPRESSOR TEST

CAUTIONS

- a. Only one Air Compressor should be tested at a time.
- b. At least one air start receiver must be pressurized to greater than 210 psig at all times.

NOTE

These instructions are written for the Train A Air Compressors. The Train B components are indicated by parentheses.

- 5.5.1 NOTIFY the Control Room that QEAB annunciator ALB35F02 DG1A LOW PRESS STARTING AIR (ALB38F02 DG1B LOW PRESS STARTING AIR) will energize in the following step. _____
- 5.5.2 CRACK-OPEN the Air Start Receiver 1 Drain, 1-2403-X4-762(723), and slowly REDUCE air receiver pressure to 145-155 psig. _____

CAUTION

If the Air Compressor fails to start automatically do not reduce air receiver pressure below 210 psig.

- 5.5.3 VERIFY the Air Start Compressor, 1-2403-G4-001-C01 (002-C01) starts automatically when the air receiver pressure is between 215 and 235 psig. _____

INITIALS

5.5.4 If the Air Compressor fails to start automatically:

a. CLOSE the Air Receiver
Drain 1-2403-X4-762(723),

b. INITIATE maintenance on the
compressor to correct the
problem.

5.5.5 NOTIFY the Control Room that QEAB
annunciator ALB35F06 DG1A SWITCH NOT
IN AUTO (ALB38F06 DG1B SWITCH NOT IN
AUTO) will energize in the following
step.

5.5.6 PLACE the Control Switch for the
Air Compressor 1,
1-2403-C4-001-C01(002-C01) in OFF.

5.5.7 When the Air Start Receiver Pressure
has been reduced to 145-155 psig,
CLOSE 1-2403-X4-762(723).

5.5.8 START the Air Compressor by
placing the Control Switch in AUTO.

5.5.9 RECORD the Air Compressor start
time on Data Sheet 1.

5.5.10 VERIFY the Air Compressor stops
automatically when air receiver
pressure is between 245 and 255 psig.

5.5.11 RECORD the time the Air Compressor
stops on Data Sheet 1.

5.5.12 NOTIFY the Control Room that QEAB
annunciator ALB35F02 DG1A LOW PRESS
STARTING AIR (ALB38F02 DG1B LOW
PRESS STARTING AIR) will energize
in the following step.

5.5.13 CRACK-OPEN the Air Start Receiver
Drain 1-2403-X4-772(728) and
slowly REDUCE air receiver pressure
to 45-155 psig.

INITIALS

CAUTION

If the Air Compressor fails to start automatically do not reduce air receiver pressure below 210 psig.

- 5.5.14 VERIFY the Air Start Compressor 1-2403-G4-001-C02(002-C02) starts automatically when the air receiver pressure is between 215 and 235 psig.
- 5.5.15 If the Air Compressor fails to start automatically:
- a. CLOSE the Air Receiver Drain 1-2403-X4-772(728),
 - b. INITIATE maintenance on the compressor to correct the problem.
- 5.5.16 NOTIFY the Control Room that QEAB annunciator ALB35F06 DG1A SWITCH NOT IN AUTO (ALB38F06 DG1B SWITCH NOT IN AUTO) will energize in the following step.
- 5.5.17 PLACE the Control Switch for the Air Compressor 2, 1-2403-G4-001-C02(002-C02) in OFF.
- 5.5.18 When the Air Start Receiver Pressure has been reduced to 145-155 psig, CLOSE 1-2403-X4-772(728).
- 5.5.19 START the Air Compressor 2 by placing the Control Switch in AUTO.
- 5.5.20 RECORD the Air Compressor start time on Data Sheet 1.
- 5.5.21 VERIFY the Air Compressor stops automatically when air receiver pressure is between 245 and 255 psig.
- 5.5.22 RECORD the time the Air Compressor stops on Data Sheet 1.

INITIALS

5.6 SYSTEM RESTORATION

5.6.1 PERFORM Checklist 1, Diesel Generator Standby Mode Status Check for the Diesel Generator which was tested.

5.6.2 RECORD DFO Storage Tank level 1-11-9024(9025) on Data Sheet 1.

5.6.3 RECORD DFO Day Tank level 1-11-9018(9019) on Data Sheet 1.

5.6.4 RECORD Air Start Receiver 1 pressure 1-PI-9060(9061) on Data Sheet 1.

5.6.5 RECORD Air Start Receiver 2 pressure 1-PI-9064(9065) on Data Sheet 1.

5.7 INDEPENDENT VERIFICATION

5.7.1 Independently VERIFY LOCKED OPEN the Air Start Receiver Discharge Isolation which was opened in Step 5.1.16.

5.7.2 Independently VERIFY CLOSED 1-2403-U4-1 (31) which was closed in Step 5.1.12.

5.7.3 Independently VERIFY LOCKED CLOSED the DFO Day Tank Drain Valve 1-2403-U4-035(036) which was closed in Step 5.3.10.5.

5.7.4 Independently VERIFY CLOSED the Air Start Receiver 1 Drain 1-2403-X4-762(723) which was closed in Step 5.5.7.

5.7.5 Independently VERIFY CLOSED the Air Start Receiver 2 Drain 1-2403-X4-772(728) which was closed in Step 5.5.18.

5.7.6 Independently VERIFY OPEN the L.O. Keep-Warm Pump 1-PI-19145(19152) Root 1-2403-X4-798(797) which was operated in Step 5.1.4.

INITIALS

- 5.7.7 independently VERIFY CLOSED the L.O. Keep-Warm Pump 1-PI-19145(19152) Root 1-2403-X4-796(795) which was operated in Step 5.1.4.
- 5.7.8 Independently VERIFY OPEN the J.W. Keep-Warm Pump 1-PI-19124(19134) Root 1-2403-X4-812(811) which was operated in Step 5.1.4.
- 5.7.9 Incepently VERIFY CLOSED the J.W. Keep-Warm Pump 1-PI-19124(19134) Root 1-2403-X4-810(809) which was operated in Step 5.1.4.
- 6.1 ACCEPTANCE CRITERIA
- 6.1.1 The Diesel Generator starts and voltage and frequency are between 4025 to 4230 volts and 58.8 to 61.2 hertz within 11.4 seconds.
- 6.1.2 The Diesel Generator operates with a load of 6800 to 7000 kW for at least 60 minutes. Modes 1, 2, 3, or 4 only.
- 6.1.3 If this test was performed as the regularly scheduled 6 month surveillance, the Diesel Generator was loaded to greater than 6100 kW within 60 seconds.
- 6.1.4 At least one DFO Day Tank Transfer Pump started and transferred fuel to the DFO Day Tank.
- 6.1.5 The DFO Day Tank contains greater than 650 gallons of fuel, 52% on 1-11-9018 (9019).
- 6.1.6 The DFO Storage Tank contains greater than 68,000 gallons of fuel, 76% on 1-11-9024 (9025).
- 6.1.7 The pressure in at least one air start receiver is at least 210 psig.
- 6.1.8 If the Diesel was operated for 60 minutes or more, the DFO Day Tank was sampled for water, and all water removed.

7.0 EVALUATION AND REVIEW

7.1 TEST PROCEDURE

☐ Surveillance: ☐ Monthly ☐ Semi-annual ☐ Both
☐ Other (explain) _____

7.2 Results obtained through performance of this procedure meet Acceptance Criteria of Section 6.0

☐ Yes ☐ No

7.2.1 NOTIFY the USS of the test results. REFER to Technical Specification 3.8.1.1 or 3.8.1.2.

7.2.2 If no was checked and the failure was due to a Diesel Generator fault, EVALUATE the reason for the failure per Table 1.

7.2.3 NOTIFY the Diesel Generator System Engineer of the Diesel Generator start. Provide the following information:

- a. A copy of Completion Sheet 1,
- b. A copy of the completed 11885-C, "Diesel Generator Operating Log".

7.3 If any parameter recorded on 11885-C was out of range, INITIATE maintenance to investigate and repair as necessary.

7.4 If either Air Compressor fails to:

- a. Start automatically at the correct pressure, or
- b. Fails to raise air receiver pressure from 150 to 250 psig in $\frac{1}{2}$ hour or less

INITIATE maintenance to repair the Air Compressor.

7.5 Comments (include any abnormal conditions and corrective actions taken): _____

USS notified of Test Completion and Results

Test Completed By: _____

Initials / Date / Time

Signature / Date / Time

Supervisory Review: _____

Signature / Date / Time

8.0 REFERENCES

- 8.1 FSAR
- 8.1.1 Technical Specification 3/4.8.1.1
- 8.1.2 Technical Specification 3/4.8.1.2
- 8.1.3 FSAR 8.3.1.3
- 8.1.4 FSAR 9.5.4.4
- 8.1.5 FSAR 9.5.5.3
- 8.1.6 FSAR 9.5.5.4
- 8.1.7 FSAR 9.5.6.4
- 8.1.8 FSAR 9.5.8.4
- 8.1.9 FSAR 1.9.108 Reg Guide 1.108
- 8.2 PROCEDURES
- 8.2.1 13145-1, "Diesel Generators"
- 8.2.2 00404-C, "Surveillance Test Tracking Program"
- 8.2.3 11885-C, "Diesel Generator Operating Log"
- 8.2.4 13325-1, "Auxiliary Feedwater Pumphouse And Diesel Generator Building HVAC Systems"
- 8.2.5 54169-1, "Diesel Generator Miscellaneous Trending And Evaluation"

- 8.3 P&ID'S
- 8.3.1 1X4DH170-1 Diesel Generator - Train A
- 8.3.2 1X4DB170-2 Diesel Generator - Train B
- 8.4 ELECTRICAL DIAGRAMS
- 8.4.1 1X3D-AA-K01A Diesel Generator Relay And Metering Diagrams
- 8.4.2 1X3D-AA-D02A Swgr 1AA02
- 8.4.3 1X3D-AA-D02B Swgr 1AA02
- 8.4.4 1X3D-AA-D03A Swgr 1BA03
- 8.4.5 1X3D-AA-D03B Swgr 1BA03
- 8.5 ELEMENTARY DIAGRAMS
- 8.5.1 1X3D-BA-D02G Breaker 1AA02-19
- 8.5.2 1X3D-BA-D03D Breaker 1BA03-19
- 8.6 LOGIC DIAGRAMS
- 8.6.1 1X5DN107-1 Diesel Fuel Oil System
- 8.6.2 1X5DN107-2 Diesel Generator Engine
- 8.6.3 1X5DN107-3 Diesel Generator Excitation
- 8.6.4 1X5DN107-4 Diesel Generator Engine Auxiliaries
- 8.6.5 1X5DN107-5 Diesel Generator Engine Auxiliaries
- 8.7 TECHNICAL MANUALS
- 8.7.1 AX4AK01-509 Diesel Engine Technical Manual
- 8.7.2 AX4AK01-563 Diesel Generator Associated Publications Manual Vol 1
- 8.7.3 AX4AK01-564 Diesel Generator Associated Publications Manual Vol 2

END OF PROCEDURE TEXT

TABLE 1

DIESEL GENERATOR VALID TEST AND FAILURE EVALUATION CRITERIA

Valid tests and failures (per Regulatory Guide 1.108, Section C.2.e and Technical Specification 4.8.1.1.3) shall be based on the following criteria:

1. All start attempts (automatic, including those from bona fide signals, or manual) that result in a failure to start, except as noted in (2) below, should be considered valid tests and failures.
2. Unsuccessful start and load attempts that can definitely be attributed to operating error; to spurious operation of a trip that is bypassed in the emergency operating mode; to malfunction of equipment that is not operative in the emergency operating mode (e.g., synchronizing circuitry) or is not part of the defined Diesel Generator unit design should not be considered valid tests or failures.
3. Successful starts, including those initiated by bona fide signals, followed by successful loading (sequential or manual) to at least 50% of continuous rating and continued operation for at least one hour should be considered valid successful tests. (Failures occurring after one hour are not considered valid failures.)
4. Successful starts that are terminated intentionally without loading, as defined in (3) above, should not be considered valid tests or failures.
5. Successful starts followed by an unsuccessful loading attempt should be considered valid tests and failures, except as noted in (2) above.
6. Tests that are terminated intentionally before completion as defined in (3) above because of an alarmed abnormal condition that would ultimately have resulted in Diesel Generator damage or failure should be considered valid tests and failures.
7. Tests performed in the process of troubleshooting should not be considered valid tests. Tests that are performed to verify correction of the problem should be considered valid tests and successes or failures, as appropriate.
8. Cranking and venting procedures that lead to the discovery of conditions (e.g., excessive water or oil in a cylinder) that would have resulted in the failure of the Diesel Generator unit during test or during response to a bona fide signal should be considered a valid test and failure.

DATA SHEET 1

DIESEL GENERATOR SURVEILLANCE DATA

DG under test: _____ Date: _____ Mode: _____

5.1 Diesel Generator Startup

5.1.5 Engine Hours at Startup: _____

5.1.7.3 Air Start Receiver Valve Closed: _____

5.1.13 Time to voltage: _____

Time to frequency: _____

5.1.14 Voltage: A-B _____

B-C _____

C-A _____

Frequency: _____ Hz

5.2 Diesel Generator Loading

5.2.1.5 Diesel Generator Loading Time _____ seconds
(6 month surveillance only)

5.2.16 Time load exceeded 6800kW: _____

5.2.19.1 Time load reduced to less than 6800kW: _____

5.3 Diesel Generator Shutdown

5.3.2 Diesel Shutdown Time: _____

5.3.8 Diesel Engine Hours at Shutdown _____

5.5.9 Air Compressor 1 start time _____

5.5.11 Air Compressor 1 stop time _____

5.5.20 Air Compressor 2 start time _____

5.5.22 Air Compressor 2 stop time _____

Sheet 2 of 2

DATA SHEET 1

DIESEL GENERATOR SURVEILLANCE DATA

5.6 System Restoration

5.6.2 DFO Storage Tank Level: _____ 1
1-LI-9024(9025)

5.6.3 DFO Day Tank Level: _____ 1
1-LI-9018(9019)

5.6.4 Air Start Receiver 1 Pressure: _____ psig
1-PI-9060(9061)

5.6.5 Air Start Receiver 2 Pressure: _____ psig
1-PI-9064(9065)

WESP	14980-1	REVISION: 18	PAGE NO. 27 of 31
------	---------	--------------	-------------------

Sheet 1 of 1

COMPLETION SHEET 1

TO: DIESEL GENERATOR SYSTEM ENGINEER

FROM: UNIT SHIFT SUPERVISOR (UNIT 1)

Diesel Generator Tested: ☐ DG1A ☐ DG1B

Start Date: / /

Shutdown Date: / /

Start Time:

Shutdown Time:

Start Engine Hours: Shutdown Engine Hours:

Start preceded by turbocharger prelubrication: ☐ Yes ☐ No

Reason for start:

☐ Surveillance Test

☐ Other:

Reason for trip or failure to start:

☐ Manual ☐ Equipment failure ☐ Trip signal ☐ Alarm Response

☐ Other:

DRA (if known) WRT # (If Known)

List any conditions that would have resulted in Diesel Generator failure to start:

Comments:

Completed By: Date Time

Reviewed By: Date Time

Diesel Generator Start Evaluation:

☐ Successful Start ☐ Valid Test

☐ Valid Failure ☐ Non-Valid Test

☐ Non-Valid Failure

Unit Shift Supervisor

Copy sent to
Diesel General System Engineer

Shift Clerk / Date

Sheet 1 of 4

CHECKLIST 1

DIESEL GENERATOR STANDBY MODE STATUS CHECK

<u>ENGINE CONTROL PANEL - PDG2(PDG4)</u>		<u>STATUS</u>	<u>INITIALS</u>
1.	All annunciator windows	No unexpected alarms.	_____
2.	Control Air Pressure 1-PI-19174 (19175)	58-62 psig	_____
3.	UNIT AVAILABLE Light	ON	_____
4.	Thermocouple Selector:		
	a. Lubricating Oil In	142-170°F	_____
	b. Lubricating Oil Out	142-170°F	_____
	c. Jacket Water In	142-170°F	_____
	d. Jacket Water Out	142-170°F	_____
5.	POWER AVAILABLE Lights:		
	a. A	ON	_____
	b. B	ON	_____
	c. C	ON	_____
6.	STOPPING light	OFF	_____

CHECKLIST 1

		STATUS	INITIALS	IV
<u>GENERATOR CONTROL PANEL - PDG1(PDG3)</u>				
1.	Unit/Parallel Switch 1-HS-4414A(4452A)	Center After Unit	_____	_____
2.	Local/Remote Switch 1-HS-4516(4517)	REMOTE	_____	_____
3.	Lockout Relays:			
a.	186A	RESET	_____	_____
b.	186B	RESET	_____	_____
c.	186C	RESET	_____	_____
4.	Voltage Regulator	AUTO	_____	_____
a.	Automatic Voltage Regulator Light	ON	_____	_____
b.	Manual Voltage Regulator Light	OFF	_____	_____
<u>MOTOR CONTROL CENTER INBI(INBO)</u>				
1.	Air After Cooler Fan No. 1	AUTO	_____	_____
2.	Air Compressor No. 1	AUTO	_____	_____
3.	Air After Cooler Fan No. 2	AUTO	_____	_____
4.	Air Compressor No. 2	AUTO	_____	_____
5.	Jacket Water Circulating Pump	AUTO	_____	_____
6.	Jacket Water Heater	AUTO	_____	_____
7.	Lube Oil Circulating Pump	AUTO	_____	_____
8.	Lube Oil Heater	AUTO	_____	_____
9.	Generator Space Heater	AUTO	_____	_____

Sheet 3 of 4

CHECKLIST 1

		STATUS	INITIALS	IV
<u>DIESEL GENERATOR SKID</u>				
1.	Governor Settings			
	Speed Droop	A: 2.6 B: 2.6	_____	_____
	Load Limit	MAX FUEL	_____	_____
	Speed	A: 14.34 B: 12.2	_____	_____
	Oil Level	Above centerline of sight glass	_____	_____
2.	Over-speed Trip Air Press (located under right bank turbocharger)	58-62 psig	_____	_____
3.	Lube Oil Level - Dipstick	MAX STATIC $\pm 1"$	_____	_____
4.	Jacket Water Keep-Warm Pressure 1-PI-19134 (19134)	15-35 psig	_____	_____
5.	Lube Oil Keep Warm Pressure 1-PI-19145 (19152)	25-50 psig	_____	_____
6.	Run/Stop Switch 1-HS-4688(4689)	PULL-TO-RUN	_____	_____
7.	Generator Bearing Oil Level	Centerline of sight glass or above	_____	_____
8.	Turbocharger Bearings			
	a. Right Bank Sight Glass	Flowing	_____	_____
	b. Left Bank Sight Glass	Flowing	_____	_____
<u>UPSTAIRS - DIESEL GENERATOR BLDG</u>				
1.	Intake Air Filter			
	a. Screens	Unobstructed	_____	_____
	b. Oil Level Sight Glass	Half Full	_____	_____
2.	Exhaust Silencer	No Combustibles in Room	_____	_____

VECP	14980-1	REVISION	PAGE NO
		18	31 of 31

Sheet 4 of 4

CHECKLIST 1

		STATUS	INITIALS	IV
<u>ELECTRICAL CONTROL PANEL QEAB - MAIN</u>				
<u>CONTROL ROOM</u>				
1.	DSL GEN 1A(1B) UNIT/PARALLEL Switch 1-HS-4414B(4452B)	NORMAL AFTER UNIT	_____	_____
2.	SYNC MODE SELECTOR Switch 1-TS-DG1A (DG1B)	AUTO	_____	_____
3.	DG1A(DG1B) OUTPUT BRKR 1-HS-1AA0219 (1BA0319)	AUTO	_____	_____
<u>4160V AC SWGR 1AA02(1BA03) - CONTROL BLDG LVL A</u>				
1.	DIESEL GENERATOR BRKR CONT SELECT SWITCH 1-HS-1AA0219B(1BA0319B)	CONT RM	_____	_____

REVIEWED BY _____ DATE _____
(OSOS, SS, or STA)