

WATTS BAR NUCLEAR PLANT
MAINTENANCE INSTRUCTION

MI-82.8

DIESEL GENERATOR 18-MONTH
ELECTRICAL INSPECTION
UNIT 1 OR 2

SEE ESPECIALLY
PAGE 8,
STEPS 6.5, 6.6

CURRENT REVISION LEVEL 0

Prepared By D. L. Anderson

Revised By N/A

Submitted By [Signature]
Supervisor

FQE Review N/A
PORC Review Date 4/10/84

Approved By [Signature]
Plant Manager

Date Approved 4/10/84

Last page of this instruction: 19

- 1C Document Control Unit, 1520 CST2-C NRC
- 1C Nuclear Safety Review Staff
- 1C Plant Master File
- Plant Manager
- Asst Plant Manager
- Plant Supt (Opers & Engg)
- Plant Supt (Maint)
- Adm. Svs. Supervisor
- Asst. Mechanical Maint. Sup.
- Chemical Laboratory
- Chemical Unit Supervisor
- Chief, Nuclear Safety Staff
- 2C Chief, Nuclear Training Branch
- Compliance Unit
- DPSO-WBN
- Document Control Supervisor
- 2C Electrical Maint. Supervisor
- Electrical Shop
- Engineering Supervisor
- 1C Field Quality Engineering Supv.
- 1C Field Services Supervisor
- 1C Health Physicist
- Health Physics Laboratory
- Instrument Engineer
- Instrument Maint. Supervisor
- Instrument Shop
- Janitor & Labor Supervisor
- Management Svs. Supervisor
- 1C Mechanical Maint. Supervisor
- Mechanical Unit Supervisor
- 1C Operations Supervisor
- Plant Program Section Supv.
- 4C&1U Planning & Scheduling Supv.
- Plant Training Officer
- Plant Training Shift Engineer
- Power Stores Unit Supervisor
- Preop Test Supervisor
- Public Safety
- Chief, Operations QA Branch
- Reactor Unit Supervisor
- Safety Engineer
- 1C Shift Engineer's Office
- 1U Stationary Equipment Group
- Technical Support Center
- 1C Unit 1 Control Room
- Unit 2 Control Room
- 1C Mech. Maint. Shop Office

HISTORY OF REVISION/REVIEW

<u>REV. NO.</u>	<u>DATE</u>	<u>REVISED PAGES</u>	<u>REASON FOR CURRENT REVISION (INCLUDE ALL TEMPORARY CHANGE NUMBERS)</u>
0	4/10/84	All	New Instruction.

DIESEL GENERATOR 18-MONTH ELECTRICAL INSPECTION

1.0 PURPOSE AND APPLICABILITY

The purpose of this instruction is to describe the 18-month annunciation and alarm checks of the emergency diesel generators located on elevation 742 of the diesel generator building. This instruction can be performed in modes 1, 2, 3, 4, 5, or 6. MI-82.3, MI-82.4, MI-82.5, and MI-82.6 will, if scheduled, be performed in conjunction with this instruction.

NOTE: Steps having the symbol "#" require documentation in the data package.

2.0 REFERENCES

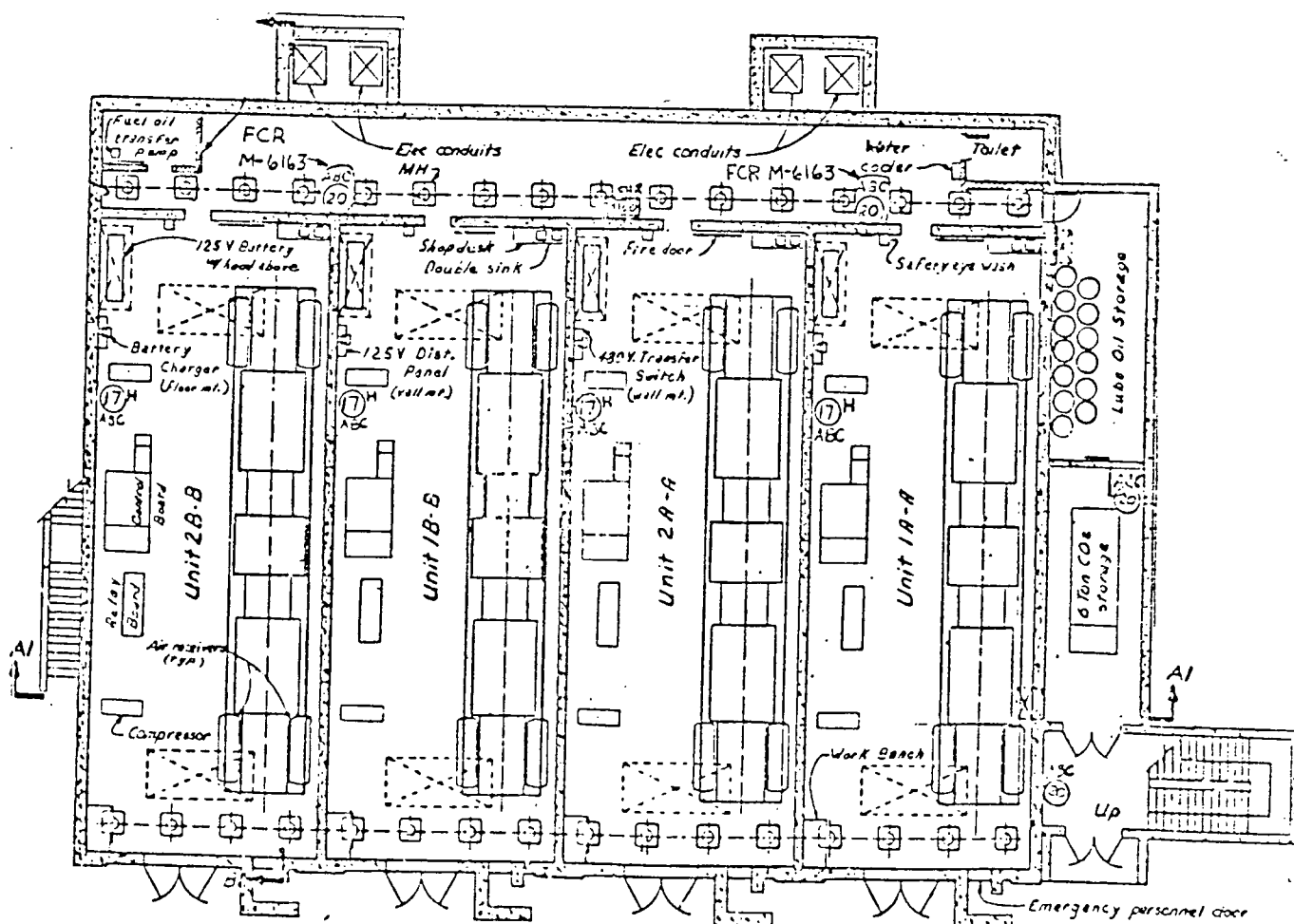
- 2.1 Instruction and parts manual for 4750-kW Diesel Generator, PSD IWO No. 6036 and No. D-379, Book 1 and 2.
- 2.2 Power system drawings: (1) D379F02501, (2) C379C11501, (3) D379C04001, (4) D379C07003, (5) D379D06002, (6) D379D9004, (7) D379F07001, (8) D379F11502. Contract No. 83090

3.0 PREREQUISITES

- #3.1 Coordinate this work with the shift engineer and obtain SE or his representative's approval to perform instruction. Necessary hold orders will be determined at time of inspection.
- 3.2 The Operations Section will provide the necessary support for the performance of this MI.
- 3.3 Ensure that communications can be established between the diesel building, auxiliary control room, and control room.
- 3.4 Notify the QA Section that hold point coverage may be required.
- 3.5 Notify the DPSO engineering unit that relay operability test will need to be performed.
- 3.6 Ensure that scheduled diesel MIs will be performed in conjunction with this instruction.

4.0 PRECAUTIONS

4.1 The emergency diesel generators are located in individual rooms on elevation 742 of the diesel building. Positively identify the proper diesel room before entering to begin work. The rooms are marked according to the diesel they contain 1A-A, 1B-B, 2A-A, and 2B-B (see Figure 1).



PLAN
EL 742.0

- 4.2 Some inspections are performed while the engines are running. Precautions should be observed when working near moving parts.
- 4.3 The proper fire fighting equipment should be located and readily accessible.
- 4.4 There shall be no smoking, open flames, or arcs in the battery area.
- 4.5 The CO₂ system will be isolated during the performance of this MI. The diesel room shall be evacuated immediately upon the audible CO₂ alarm, if it occurs.

5.0 PREPARATION FOR WORK

5.1 Obtain the following tools for the performance of this SI:

- 5.1.1 Crankover tool - power systems, EMD No. 8444939.
- #5.1.2 Stopwatch (calibrated)

6.0 PERFORMANCE OF WORK

6.1 Air start system check

- 6.1.1 Place the air compressor selector switches in the AUTO position.
- #6.1.2 Open the 1/2" drain valve on the normal start air tank on engine "A." Verify that the air compressor is energized when the tank pressure falls below 210 psi. Record the pressure in Appendix A.
- #6.1.3 Open the 1/2" drain valve on the normal start air tank on engine "B." Verify that the air compressor is energized when the tank pressure falls below 210 psi. Record the pressure in Appendix A.

6.1.4 Place the air compressor selector switches in the OFF position.

NOTE: On this step and any subsequent steps requiring verification of alarms at remote locations, the person coordinating the test from the diesel panel will sign for the remote locations upon telephone verification by persons stationed at the remote location.

- #6.1.5 Verify that the "Low Air Pressure" annunciation and alarm are energized on panels 0-L-4, 0-M-26, and the engine control panel when the air pressure falls below 200 psi. Reset alarms and record results in Appendix A.

- 6.1.6 Close the 1/2" drain valves on the normal start air tanks and return the air compressor selector switches to the AUTO positions.
- 6.1.7 Isolate all four of the air start motors from the air tanks by closing both of the 2" shutoff valves on the "A" engine air start system.
- 6.1.8 With the "Remote-Local" selector switch in the LOCAL position, attempt to start the diesel from the local start pushbutton. Verify the following:

CAUTION: To ensure that the engines will not start, hold the injector control levers in the STOP position.

- #6.1.8.1 "Low Air Pressure" annunciation and alarm on panels O-M-26, O-L-4, and the engine control panel are energized.
 - #6.1.8.2 Air-start motors on engine B attempts to engage at least 5 times before shutdown.
 - #6.1.8.3 The time interval between the start initiation and the energizing of "Failed to Start" annunciation was $5 \pm 1/2$ seconds.
 - #6.1.8.4 The "Failed to Start" and "Unit Lockout" annunciation are energized on panels O-L-4, O-M-26, and the engine control panel
- #6.1.9 Reset the unit lockout relay (SDR) and open the valves closed in step 6.1.7. Reset the alarms.
- 6.2 Check the "Fail to Run" alarm isolation and speed switch annunciation.
- #6.2.1 Assure that the "Remote-Local" selector switch is in the LOCAL position. Place the "Maintenance-Auto" selector switch in the MAINTENANCE position. Verify that the maintenance position annunciation lamp is energized on panels O-M-26, O-L-4, and the engine control panel.
 - 6.2.2 Initiate the idle start mode by pressing the idle start switch. Verify the following:
 - #6.2.2.1 Check light for start sequence relays is energized.
 - #6.2.2.2 Both redundant motor-driven fuel pumps are operating.
 - #6-2.2.3 Both check lights for speed switch relay No. 1 (40 rpm) are energized when the engine speed reaches 40 rpm.

- #6.2.2.4 Both check lights for speed switch relay No. 2 (200 rpm) are energized when the engine speed reaches 200 rpm.
- #6.2.2.5 The time interval between the energizing of speed switch No. 2 and the delay of TD5 relay is 60 ± 6 seconds.
- #6.2.2.6 Verify idle speed is between 350 to 400 rpm.
- #6.2.2.7 Momentarily electrically short across terminals No. 9 and No. 11 of relay R9 (idle start relay). Verify alarm and "Lube Oil Pressure Low" annunciation on panels 0-M-26, 0-L-4, and the engine control panel. Reset all alarms.
- #6.2.3 Lower the engine speed using the governor control switch. Begin timing when the speed switch No. 2 check lights are deenergized and measure the time it takes for the "Failed to Run/Start" annunciation to be energized at the engine control panel ($4 \pm 1/2$ seconds). Verify annunciation also at panels 0-M-26 and 0-L-4. Record results in Appendix A.
- 6.2.4 Increase the engine speed until the "Failed to Run/Start" annunciation can be reset (> 200 rpm). Continue increasing the engine speed until the speed switch No. 3 check lights are energized. Verify the following:
 - #6.2.4.1 Both check lights for speed switch No. 3 (400 rpm) are energized when the engine speed reaches 400 rpm.
 - #6.2.4.2 The time interval between the energizing of speed switch No. 3 check lights and the "Failed to Run/Start" annunciation at the engine control panel is 8 ± 1 seconds. Verify annunciation also at panels 0-M-26 and 0-L-4. Record results in Appendix A.
- 6.2.5 Continue increasing the engine speed until 900 rpm is reached. Reset the alarms. Verify that both check lights for speed switch No. 4 (850 rpm) and the "Engine Running" panel are energized when the engine speed reaches 850 rpm. Record results in Appendix A.
- 6.3 Normal stop check
 - 6.3.1 With engine speed at 900 rpm, press the normal stop switch and verify the following:
 - #6.3.1.1 The time interval between normal stop initiation and the pickup of TD4 relay (normal shutdown) is 10 ± 1 minute.
 - #6.3.1.2 The time interval between the deenergizing of speed switch No. 1 (40 rpm) check lights and the dropout of TD8 relay (normal STOP) is 10 ± 1 second.

6.4 Check operation of protective devices.

6.4.1 Check annunciation

NOTE: The following checks shall be made with the diesels not running, the maintenance-auto selector switch in the maintenance position, and the local-remote selector switch in the local position. One person shall be stationed at panel O-M-26 in the main control room, one at panel O-L-4 in the auxiliary control room, and one at the engine control panel. Establish communications between the engine control panel, auxiliary control room, and control room.

#6.4.1.1 Close air starting valves.

#6.4.1.2 Isolate auto flash signal.

#6.4.1.3 Turn exciter regulator off.

NOTE: If scheduled and time permits, perform MI-82.4, MI-82.5, MI-82.6 in conjunction with this instruction before diesels are started.

#6.4.1.4 Verify that the "Power On" light is energized on the engine control panel.

#6.4.1.5 Momentarily electrically short across the battery undervoltage relay alarm contacts (located in battery charger). Verify alarm and "Low Battery Voltage" annunciation on all three panels. Reset all alarms.

#6.4.1.6 Momentarily electrically short across the NC and COM terminals of the EDT relay (located in the auxiliary engine control panel). Verify alarm and "Exhaust Temperature Differential" annunciation on all three panels after a time delay of approximately 10 minutes. Reset all alarms.

#6.4.1.7 Momentarily electrically short across terminals No. 1 and No. 5 of relay TDC (located in exciter cubicle). Verify alarm and "Governor Actuator Differential" annunciation on all three panels. Reset alarms.

#6.4.1.8 Verify that the "Maintenance Position" light is energized on all three panels.

#6.4.1.9 Place the maintenance auto selector switch in the auto position. Verify the "Ready for Auto Start" light is energized on the appropriate panels. Return the selector switch to the maintenance position.

- #6.4.1.10 Momentarily open the breaker on the 125-V dc diesel generator battery distribution panel. Verify alarm and "Control Power Failure/Blown Fuse" annunciation on all three panels. Close breaker and reset all alarms.
- #6.4.1.11 Momentarily electrically short across the alarm contacts of the LLOP pressure switch. Verify alarm and "Lube Oil Pressure Low" annunciation on all three panels.
- #6.4.1.12 Momentarily electrically short across terminals No. 1 and No. 5 on relay TD5. Verify alarm and "Lube Oil Pressure Low" annunciation on all three panels. Reset all alarms.
- #6.4.1.13 Momentarily electrically short across terminals No. 9 and No. 11 on relay TD5X. Verify alarm and "Fuel Oil Pressure Low" annunciation on panels O-M-26 and O-L-4. Verify alarm and "Engine Driven Fuel Oil Pump Low Pressure," "Motor Driven Fuel Oil Pump Low Pressure," and "Low Fuel Oil Header Pressure" annunciations on the engine control panel. Reset all alarms.
- #6.4.1.14 Momentarily electrically short across the alarm contacts of the LFOLS limit switch. Verify alarm and "Fuel Oil Level Abnormal/Low Fuel Oil Level" annunciation on all three panels. Reset all alarms.
- #6.4.1.15 Momentarily electrically short across the alarm contacts of the HFOLS limit switch. Verify alarm and "Fuel Oil Level Abnormal/High Fuel Oil Level" annunciation on all three panels. Reset all alarms.
- #6.4.1.16 Momentarily electrically short across the alarm contacts of the OTS limit switch. Verify alarm and "Overspeed Trip" annunciation on all three panels. Reset all alarms.
- #6.4.1.17 Momentarily electrically short across the alarm contacts of the LJWTS temperature switch. Verify alarm and "Jacket Water Temperature High-Low/Jacket Water Temperature Low" annunciation on all three panels. Reset all alarms.
- #6.4.1.18 Momentarily electrically short across the alarm contacts of the HJWTS temperature switch. Verify alarm and "Jacket Water Temperature High-Low/Jacket Water Temperature High" annunciation on all three panels. Reset all alarms.

- #6.4.1.19 Momentarily electrically short across the alarm contacts of the LWLS level switch. Verify alarm and "Level or Pressure Abnormal/Low Engine Water" annunciation on all three panels.
- #6.4.1.20 Momentarily electrically short across the alarm contacts No. 9 and No. 11 of relay TD5X1. Verify alarm and "Level or Pressure Abnormal/Low Engine Water" annunciation on all three panels. Reset all alarms.
- #6.4.1.21 Momentarily electrically short across the alarm contacts of RIX and simultaneously short across the alarm contacts of the LWLS level switch. Verify alarm and "Level or Pressure Abnormal/Low Engine Water" annunciation on all three panels. Reset all alarms.
- #6.4.1.22 Momentarily electrically short across the alarm contacts of LLSLS level switch. Verify alarm and "Low Lube Oil Level" annunciation on all three panels.
- #6.4.1.23 Momentarily electrically short across the alarm contacts of CPS pressure switch. Verify alarm and "Crankcase Oil Pressure High" annunciation at all three panels. Reset all alarms.
- #6.4.1.24 Momentarily electrically short across the HAIP pressure switch. Verify alarm and "High Air Intake Pressure" annunciation on all three panels. Reset all alarms.

#6.5 Visually inspect the complete voltage regular and exciter panels for loose connections, burned contact surfaces, dirty rectifier plates, and clogged air screens or vents. Any accumulation of dust should be removed from the unit with a soft bristle brush or with an air line that has a moisture trap.

CAUTION: Ensure proper safety equipment is utilized when cleaning is performed.

#6.6 Open the diesel generator control panel breaker, the excitation breaker, and the generator protective relaying breakers located in the dc distribution panel, and inspect all relays, contactors, and circuit breakers. The list of the devices to be inspected is included in Appendix A. Following completion of inspection, close the above listed breakers.

6.7 Appendix A completed and attached.

#6.8 Remove all tools, material, and clean up work area.

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#6.9 Have Operations realign diesel generator system for normal standby mode per appropriate SOI.

#6.10 Notify the shift engineer or his designated representative upon completion of this instruction.

7.0 POST MAINTENANCE TESTING

7.1 Perform SI-8.20 to verify operability.

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APPENDIX A

DATA PACKAGE COVER SHEET

DIESEL GENERATOR 18-MONTH INSPECTION

Unit _____ Diesel Generator No. _____

Performed by _____ / _____ Date _____
Title

Were technical specification criteria satisfied? _____ Yes _____ No

If criteria were not satisfied, notify the shift engineer who completes the following:

Was a limiting condition for operation violated?
_____ Yes (explain in remarks) _____ No (explain in remarks)

Verified by _____ Date _____
Shift Engineer

Reason for test:

Required by schedule
 Maintenance complete on _____

All calibrated instruments and tools utilized in this instruction have been recorded in the CSSC Instrument and Tool Log.

Maintenance Personnel / Date

Review of Test Results

Electrical Engineer Date _____

Review and Approval of Test Results

Maintenance Supervisor Date _____

Rescheduled

QA Staff Date _____

REMARKS: _____

APPENDIX A

NOTE: Initial specs provided to provide documentation. Date _____

3.1 Shift engineer's approval _____

Step No.	Inspection	Shift Engineer S/N _____ Engine No. _____	S/N _____ Engine No. _____	S/N _____ Generator No. _____
5.1.2	Stopwatch ser # _____	Cal Due Date _____		
6.1.2	Compressor energized when air pressure is less than 210 psi.	_____ lbs		
6.1.3	Compressor energized when air pressure is less than 210 psi.		_____ lbs	
6.1.5	"Low air pressure" annunciation on panels 0-L-4, 0-M-26, and engine control panel when pressure is less than 200 psi.	_____ psi 0-L-4 _____ psi 0-M-26 _____ psi control panel	_____ psi 0-L-4 _____ psi 0-M-26 _____ psi control panel	
6.1.8.1	"Low air pressure" annunciation on panels 0-L-4, 0-M-26, and engine control panel.	_____ 0-L-4 _____ 0-M-26 _____ control panel	_____ 0-L-4 _____ 0-M-26 _____ Control Panel	
6.1.8.2	Air start motors engage at least five times.			
6.1.8.3	Time interval for "failed to start" annunciation 5 ± 1/2 sec.	_____ sec	_____ sec	
6.1.8.4	"Failed to start" and "unit lockout" annunciation on 0-L-4, 0-M-26, and engine control panel.		_____ 0-L-4 _____ 0-M-26 _____ Engine _____ Control Panel	
6.1.9	Valves open, alarms reset			
6.2.1	Maintenance position annunciation lamp.		_____ 0-L-4 _____ 0-M-26 _____ Engine _____ Control Panel	

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Step No.	Inspection	Shift Engineer		
		S/N _____ Engine No. _____	S/N _____ Engine No. _____	S/N _____ Generator No. _____
6.2.2.1	Check light for start sequence	_____	_____	_____
6.2.2.2	Redundant motor-driven fuel pumps operating	_____	_____	_____
6.2.2.3	Speed switch relay #1 (40 rpm) energized	_____	_____	_____
6.2.2.4	Speed switch relay #2 (200 rpm) energized	_____	_____	_____
6.2.2.5	Pickup of TD5 relay 60 ± 6 seconds	_____ sec	_____ sec	_____
6.2.2.6	Idle speed is 350 to 400 rpm	_____ rpm	_____ rpm	_____
6.2.2.7	"Lube Oil Pressure Low" annunciation on panels O-M-26, O-L-4, and engine control panel	_____ O-L-4 _____ O-M-26 _____ Control Panel	_____ O-L-4 _____ O-M-26 _____ Control Panel	_____ O-L-4 _____ O-M-26 _____ Control Panel
6.2.3	"Failed to Run/Start" annunciation time delay of 4 ± 1/2 seconds	_____ O-L-4 _____ O-M-26 _____ Control Panel	_____ O-L-4 _____ O-M-25 _____ Control Panel	_____ O-L-4 _____ O-M-25 _____ Control Panel

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Step No.	Inspection	Shift Engineer		
		S/N _____ Engine No. _____	S/N _____ Engine No. _____	S/N _____ Generator No. _____
6.2.4.1	Check lights for speed switch #3 (400 rpm) energized.	____ O-L-4 ____ O-M-26 ____ Control Panel	____ O-L-4 ____ O-M-26 ____ Control Panel	
6.2.4.2	"Failed to Run/Start" annunciation of 8± 1 second	____ O-L-4 ____ O-M-26 ____ Control Panel	____ O-L-4 ____ O-M-26 ____ Control Panel	
6.2.5	Check lights for speed switch #4 (850 rpm) energized	____ O-L-4 ____ O-M-26 ____ Control Panel	____ O-L-4 ____ O-M-26 ____ Control Panel	
6.3.1.1	Time delay of TD4 is 10 ± 1 minute	____ min	____ min	
6.3.1.2	Time delay of TD8 relay is 10 ± 1 second	____ sec	____ sec	
6.4.1.1	Air starting valves closed	_____	_____	
6.4.1.2	Isolate auto flash signal			_____

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Step No.	Inspection	Shift Engineer		
		S/N _____ Engine No. _____	S/N _____ Engine No. _____	S/N _____ Generator No. _____
6.4.1.3	Exciter regulator off			
6.4.1.4	"Power On" light			
6.4.1.5	"Low Battery Voltage" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.6	"Exhaust Temperature Differential" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.7	"Governor Actuator Difference annunciation" on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.8	"Maintenance Position" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.9	"Ready for Auto Start" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.10	"Control Power Failure/Blown Fuse" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	

Date _____

Step No.	Inspection	Shift Engineer		
		S/N _____ Engine No. _____	S/N _____ Engine No. _____	S/N _____ Generator No. _____
6.4.1.11	"Lube Oil Pressure Low" annunciation on all three panels	_____ O-L-4	_____ O-L-4	
		_____ O-M-26	_____ O-M-26	
		_____ Control Panel	_____ Control Panel	
6.4.1.12	"Lube Oil Pressure Low" annunciation on all three panels	_____ O-L-4	_____ O-L-4	
		_____ O-M-26	_____ O-M-26	
		_____ Control Panel	_____ Control Panel	
6.4.1.13	"Fuel Oil Pressure Low" annunciation	_____ O-L-4	_____ O-L-4	
		_____ O-M-26	_____ O-M-26	
	"Engine Driven Fuel Oil Pump Low Pressure" annunciation	_____ O-L-4 _____ O-M-26 _____ Control Panel	_____ Control Panel	
	"Motor Driven Fuel Oil Pump Low Pressure" annunciation	_____ Control Panel	_____ Control Panel	
	"Low Fuel Oil Header Pressure" annunciation	_____ Control Panel	_____ Control Panel	
6.4.1.14	"Fuel Oil Level Abnormal/Low Fuel Oil Level" annuncia- tion on all three panels	_____ O-L-4	_____ O-L-4	
		_____ O-M-26	_____ O-M-26	
		_____ Control Panel	_____ Control Panel	
6.4.1.15	"Fuel Oil Level Abnormal/High Fuel Oil Level" annunciation on all three panels	_____ O-L-4	_____ O-L-4	
		_____ O-M-26	_____ O-M-26	
		_____ Control Panel	_____ Control Panel	

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Step No.	Inspection	Shift Engineer		
		S/N _____ Engine No. _____	S/N _____ Engine No. _____	S/N _____ Generator No. _____
6.4.1.16	"Overspeed Trip" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.17	"Jacket Water Temperature High-Low/Jacket Water Temperature Low" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.18	"Jacket Water Temperature High-Low/Jacket Water Temperature Low" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.19	"Level or Pressure Abnormal/Low Engine Water" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.20	"Level or Pressure Abnormal/Low Engine Water" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.21	"Level or Pressure Abnormal/Low Engine Water" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.22	"Low Lube Oil Level" annunciation in all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	
6.4.1.23	"Crankcase Oil Pressure High" annunciation on all three panels	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	_____ O-L-4 _____ O-M-26 _____ Control _____ Panel	

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Step No.	Inspection	Shift Engineer		
		S/N _____ Engine No. _____	S/N _____ Engine No. _____	S/N _____ Generator No. _____
6.4.1.24	"High Air Intake Pressure" annunciation on all three panels	____ O-L-4 ____ O-M-26 ____ Control Panel	____ O-L-4 ____ O-M-26 ____ Control Panel	
6.5	Visually inspect voltage regulator and exciter panels			

APPENDIX A

6.6 Inspect relays, contactors, and circuit breakers:

_____ (1) BF2	_____ (43) AV1A
_____ (2) R3X1	_____ (44) AV2A
_____ (3) R3	_____ (45) AV1B
_____ (4) RS	_____ (46) AV2B
_____ (5) BF5	_____ (47) TD5
_____ (6) BF6	_____ (48) TD9
_____ (7) BF3	_____ (49) TD5X
_____ (8) BF4	_____ (50) TD5X1
_____ (9) FFP1	_____ (51) TD5X2
_____ (10) FFP2	_____ (52) BFA
_____ (11) R1X	_____ (53) BFD
_____ (12) R1X1	_____ (54) BFB
_____ (13) R1	_____ (55) 74
_____ (14) R1X2	_____ (56) 66LCR
_____ (15) R9X	_____ (57) Annunciation Relays
_____ (16) TD7	_____ (58) RA
_____ (17) R9	_____ (59) RB
_____ (18) FT	_____ (60) LA
_____ (19) ERR	_____ (61) LB
_____ (20) PO	_____ (62) TD10
_____ (21) R2	_____ (63) K2
_____ (22) R2X	_____ (64) K4
_____ (23) SDR	_____ (65) DR"O"
_____ (24) SDRX	_____ (66) DR"R"
_____ (25) SDRX1	_____ (67) OVR
_____ (26) TD8X	_____ (68) LFT
_____ (27) TD8X1	_____ (69) SRX1A
_____ (28) TD8	_____ (70) SLX1A
_____ (29) TD4	_____ (71) LRX1A
_____ (30) R7	_____ (72) PX1A
_____ (31) R7X	_____ (73) MAX1A
_____ (32) SS1	_____ (74) R01
_____ (33) SS1X	_____ (75) R02
_____ (34) SS2	_____ (76) RRX1A
_____ (35) SS2X	_____ (77) ESX1A
_____ (36) SS3	_____ (78) ESX11A
_____ (37) SS3X	_____ (79) MLX1A
_____ (38) SS4	_____ (80) AX1A
_____ (39) SS4X	_____ (81) ARX1A
_____ (40) RAM	_____ (82) ALX1A
_____ (41) TD3	_____ (83) RC1
_____ (42) TD1	_____ (84) RC2

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APPENDIX A

Initials

6.8 All tools and material removed.
Work area clean.

6.9 System realigned

Operations

6.10 Shift engineer or his designated representative
has been notified upon the completion of this
instruction.

7.1 SI-8.20 performed.
