

## CHAPTER 3

### PERIODIC MAINTENANCE AND OVERHAUL

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**1 GENERAL**

Inspection and preventative maintenance of the gas turbine, accessories and monitoring systems is recommended at the subsequent established intervals. A log sheet system should be operated to enable progressive variations to be detected and where necessary corrective action instigated.

Unless the log system is maintained and developments noted, it may impede the service technician in carrying out preventive maintenance. The possible result is that 'down-time' may occur during periods of desired operation; with the inevitable consequences to dependent systems.

The maintenance schedule for this installation with the recommended service interval for component parts operating under 'normal' conditions is to be found in Part 1 (Chapter 4) of this Operators Manual. This maintenance schedule will be subject to modification according to experience gained over a period of operation and the environmental conditions experienced.

The information provided in this Chapter covers those items of maintenance that can be considered within the Operator's function at the Local Control Room and at the Gas Turbine/Generator Unit.

The following periodic inspection procedures are given:

- » Daily inspection routine
- » Weekly inspection routine for stand-by and continuous duty units
- » Monthly inspection routine for stand-by and continuous duty units
- » Inspection routines for intervals exceeding one month
- » Yearly or major overhauls

**2 DAILY INSPECTION**

It is recommended that the following inspection and maintenance work be carried out as a daily routine. The approximate time to complete this inspection is 15 minutes.

1. Check the indicator lamps on the Turbine, Generator and Other Control Panels by operating the respective 'Lamp Test' functions. Renew any indicator lamps that have failed.
2. Check the proper status of the control panel lamps, when the unit is in 'stand-by' mode. Refer to Part 2 of this Operating Manual for the status indications.
3. Observe and record all values indicated by the instrumentation on the turbine and generator control panels.
4. Check for leakages in the lubricating oil, steam, water and fuel systems. Eliminate leakages by tightening pipe fittings; installing new gaskets or by the use of approved sealing agents.
5. Check that all ancilliary systems are functioning to specifications; for example Ventilation fans, fire and gas detection systems,

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**3 WEEKLY INSPECTION**

It is recommended that if the gas turbine unit is to be in 'stand-by' mode, for a long period of time, that it is started once a week and run for approximately 10 minutes at the rated speed and without load. The approximate time to complete this inspection is 30 minutes.

The monthly inspection for the unit on 'stand-by' includes a period of turbine operation under load, and it should be carried out at least once a month as a substitute for the weekly inspection.

**NOTE:** Where the unit cannot be operated for a period and where in particular the Generator Stator Heating Elements are functioning it is important that the Generator Rotor be turned 180°, at least once a week, to limit thermal distortion. Failure to prevent the distortion caused by uneven temperatures on the rotor may cause vibration problems when starting the unit. The vibration caused by extreme cases of thermal distortion of the rotor may be sufficient to cause a shut-down alarm.

To enable the Generator Rotor to be turned by hand a turning bar tool is available.

The following inspection should be carried out in conjunction with the off-load operation of the turbine:

Prior to starting the turbine proceed with the following:

1. Check the Turbine and Generator Lubricating Oil Reservoir Tanks. Refill to the correct level if necessary.

**NOTE:** When replenishing the oil do not overfill the tank. An overfull tank results in oil blowing out of the tank vents. Never mix lubricating oils of different grades and source of supply.

2. Check for leakages in the lubricating oil, steam, water and fuel systems. Eliminate leakages by tightening pipe fittings; installing new gaskets or by the use of approved sealing agents.
3. Inspect hoses for abrasion or damage.
4. Operate the Gas Turbine as per the instructions in Part 3 of this Operator Manual.

Start and run the turbine off load for approximately ten minutes. During the start sequence observe the operation of the hydraulic start system.

When the turbine speed has stabilized at the rated speed record all the monitored information and compare with the records from previous operational tests.

Observe indicator gauges on the panels around the exterior of the Turbine Generator Enclosure and note their indications. Compare with the readings indicated on the Turbine/Generator Control Units. Report any discrepancies to the Service Personnel.

Check for leakages in the lubricating oil and fuel systems. Eliminate leakages by tightening pipe fittings; installing new gaskets or by the use of approved sealing agents.

Record all discrepancies in the turbine log.

Check the lubricating oil flow to the generator bearings.

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**4 MONTHLY INSPECTION**

It is recommended to extend the weekly operating test once a month and operate the turbine for approximately thirty minutes. The time required to complete this inspection is approximately forty-five minutes.

It is mandatory that prior to start-up of the turbine the procedures listed in Paragraph 3 of this Section are performed to the point of starting the turbine.

Once the pre-start checks have been completed proceed as follows:

1. Start the turbine and run it for approximately for thirty minutes at rated speed, if possible under full load. Check the hydraulic start system pressures at the time of starting the turbine.
2. With the turbine at stabilized running conditions, record all monitored indications and compare them with records from previous operating periods.
3. Record all discrepancies in the log.
4. Check the lubricating oil pressure to the generator bearings.
5. Check the pressure drop across duplex filters. If the differential pressure is excessive, switch from the active filter to the stand-by filter. Note in the log that the change has been made and arrange for the clogged filter to be attended to at the next convenient service period.
6. Compressor cleaning procedures are given in the Technical Manual and also in Part 3, Chapter 13 of this Operating Manual. They should be performed if a reduction in turbine power is noted; or after a period of extended turbine operation.
7. Check the ignition system for correct operation.

**CAUTION:** High voltage is produced from the ignition units do not touch cables or connections until at least 5 minutes after isolation of the ignition system.