

# Gas turbine Storage and Preservation

## 1.1 General

The unit is from the factory adequately prepared for shipment and is designed for continuous or stand-by service after commissioning. All outer surfaces are painted or in other way protected against corrosion.

If it is necessary to store the unit for a long period before erection and first start, special precautions must be taken to prevent corrosion on unprotected indoor surfaces. Precautions must also be taken to preserve the plant during longer outage periods.

## 1.2 Corrosion

The air surrounding the stored goods is the most important parameter for the risk of corrosion. Several properties like salt or acid air pollution, but mainly the air humidity influences the corrosion attack on unprotected surfaces.

Tests have shown that corrosion on an iron surface is practically none below 45% relative humidity and increases drastically when it passes 60%.

The most efficient way to preserve an unprotected surface from corrosion is to control the air humidity and to limit it to maximum 50% and preferably 45%.

To control the air humidity, it is necessary to seal off the rooms as efficiently as possible from the atmosphere and then either by placing humidity absorbent bags in each room or to connect air dryers for controlled ventilation of the rooms. The air humidity must be checked regularly and the absorbents changed when saturated.

## 1.3 Storage

If a unit has to be stored a period prior to commissioning the necessary actions depend on the expected storage time but also on environmental conditions.

### 1.3.1 Main Unit

All openings of the main unit are sealed in the factory and humidity absorbent bags are placed in the rooms.

During longer storage periods, installation of air dryers replacing the absorbent bags should be considered. Irrespectively of method chosen, all outward openings like door chinks, air intake, exhaust, pipes, etc. should be carefully sealed, but notice that no space should be left without absorbent or free connection to a dry room.

#### Storage < 24 months

Check monthly that all enclosures, covers and sealings are undamaged and in good condition.

Check monthly that absorbent bags are placed in all rooms and replace them if saturated.

Check monthly the relative humidity in the rooms and if it is 50 % or higher the amount of absorbents must be increased.

### 1.3.2 Gas Turbine & AC Generator (If applicable)

Circulate every six months clean and filtered lubrication oil of the specified quality through the gas turbine and generator bearings and turn the rotor 180°, by using the barring tool, socket and seal plate, included in the standard tool kit.

### 1.3.3 Auxiliaries

Check that all covers and sealings are in good condition and place the equipment in an indoor storage, which is heated or connected to an air dryer.

## 1.4 Preservation

If a unit has to be out of service for a longer period, actions must be taken to limit corrosion attack on unprotected surfaces. Carefully note all actions in the logbook of the unit.

### 1.4.1 Preservation < 6 months

Keep all equipment like heaters, battery chargers and ventilating fans in service as during normal stop periods.

Ensure that the generator heater is on to maintain generator temperature  $>5^{\circ}\text{C}$  ( $>9^{\circ}\text{F}$ ) higher than the ambient.

### 1.4.2 Preservation > 6 months

Seal off the air intakes and outlets, door chinks, etc. and install air dryers or absorbent in all closed rooms. Open valves, flanges, etc. to prevent any closed space where condensed water can be trapped.

#### 1.4.2.1 General

Inspect the plant every six months and pay special attention to air dryers, absorbents, covers and sealings.

Check further that there is no rust on unprotected surfaces and that no condensed water is collected.

#### 1.4.2.2 Gas Turbine & AC Generator (If applicable)

Circulate lubricating oil through the bearings and turn the rotor  $180^{\circ}$  every six months by using the barring tool, socket and seal plate, included in the standard tool kit.

#### 1.4.2.3 Lubricating Oil System

The lubricating oil can be left in the tank but seal off the outdoor oil vapour outlet.

#### 1.4.2.4 Internal Gas Fuel System

Seal off the outdoor vent pipes and remove the inner sections of the line to allow free communication between the piping and the enclosure.

#### 1.4.2.5 Internal Fuel Oil System

Diesel oil can be left in the system but carefully vent the system and remove all trapped air. If ordinary fuel is a lighter liquid, like naphtha, this should before stop be replaced by diesel oil, before stop.

Seal off the outdoor vent outlet from the service tank and remove a section of the line to allow free communication between the service tank and the enclosure.

#### 1.4.2.6 Electrical Equipment

The batteries must be float charged during the stop or replaced before the unit is taken into service again.

### 1.5 Restart

When the unit is started after a period of preservation after the first commissioning the following should be added to the checks before start.

1. Check that all actions taken during preservation/storage and noted in the logbook, to be reset before start.
2. Check the capacity of the DC battery by means of a discharge test or install new batteries.
3. Carry out a compressor cleaning, off line wash, before start.
4. Check that the running out time for the barred rotor (s) is (are) normal.
5. Check the insulation resistance of the generator (Valid for preservation >12 months only).
6. Check insulation resistance of electrical motors. (Valid for preservation >12 months only).