

# PGT25 to HiFlow Uprate

## Benefits

- ■ ■ Increased production
- □ □ Higher efficiency
- □ □ Compliance with environmental regulations
- □ □ Availability and Reliability
- □ □ Life extension

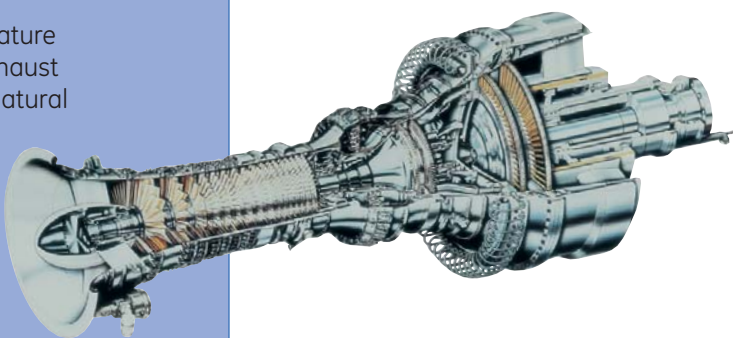
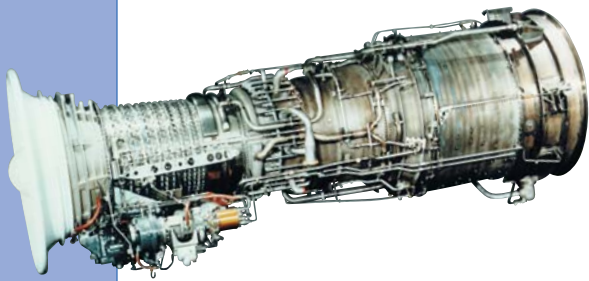
Customer benefits also include the following:

- Significant increase in shaft output power (15% on ISO condition and at least 10% over a large ambient temperature range) and cycle efficiency
- Optimization for low and high ambient temperature
- Cost-effective solution vs. the installation of a new machine

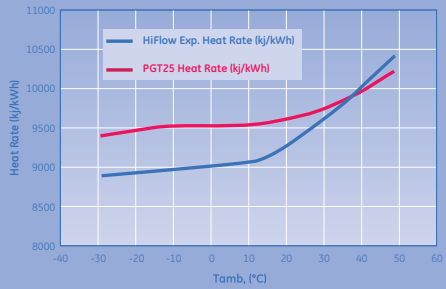
This uprate has a small incremental cost and a short payback period especially if planned concurrent with a major overhaul of the existing PGT25 and with a buy back of the existing LM2500. In addition the installation of this uprate can be done within 25-day outage.

### Performance

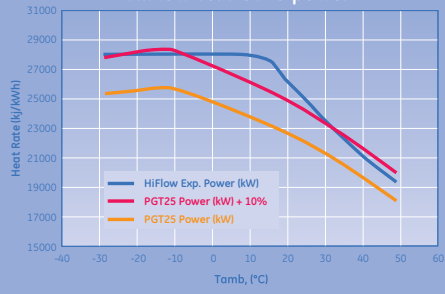
The figures below show the effect of compressor inlet temperature on output and base load heat rate with zero inlet and zero exhaust pressure drops at sea level, 60% Relative Humidity (RH), and natural gas, at 100% Low Pressure (LP) shaft speed.



HiFlow vs. PGT25 heat rate



HiFlow vs. PGT25 power



## What it is

HiFlow, with a rated ISO shaft power output of 27 MW and a 9,500 kJ/kWh heat rate (DLE version), is a retrofit for the PGT25 aimed at enhancing output power by means increased flow capacity of the LM2500+ Gas Generator in conjunction with a modified power turbine.

It is capable of operating with steam injection for NOx abatement with a variety of fuels including:

- Natural gas
- Syngas and medium BTU gas

- Liquid fuel
- Dual fuel (natural gas or liquid fuel)
- Bi-fuel (natural gas and liquid fuel)

DLE applications include:

- Gas only DLE at 25 ppmvd
- Dual fuel DLE at 25 ppmvd



## How it works

### Gas Generator

The LM2500+ gas generator is the uprated version of the LM2500 gas generator that has accumulated several million fired hours not only as an aircraft engine (CF6-6), but also in mechanical drive marine and industrial applications including onshore and offshore gas transmission.

The LM2500+ gas generator incorporates a 17-stage axial flow compressor capable of reaching a 21.5:1 pressure ratio. Inlet guide vanes and adjustable stator vanes on the first seven compressor stages provide efficient performance over the entire operating range. An annular combustor delivers a uniform temperature profile to the two-stage high pressure power turbine driving the axial compressor. The combustor is available with a dual fuel DLE system.

### Power Turbine – HiFlow

The HiFlow power turbine is an improved 2-stage PGT25 that has been developed to take advantage of

the increased flow of the LM2500+ gas generator. It is based on proven technology already developed for the PGT25. Most of the hardware is common with the PGT25 including the frame, bearings, lubrication system and proven materials. As a consequence of this heritage the HiFlow has the same reliability, availability and maintenance intervals as its predecessor. Main modifications are:

#### 1<sup>st</sup> Stage nozzles

- Rotated airfoil
- New casting

#### 1<sup>st</sup> Stage blading

- Rotated airfoil
- Material changed to R125
- New casting

#### 2<sup>nd</sup> Stage nozzles

- Rotated airfoil
- New casting

#### 2<sup>nd</sup> Stage blading

- Rotated airfoil
- New casting

#### Updated thrust bearings

### Scope of Supply

Thanks to the similarities of the footprint, centerlines and flanges with the LM2500 gas generator, the HiFlow conversion can be carried out with little modification to the standard PGT25 package.

The standard scope of supply includes:

- New LM2500+ gas generator
- Upgrade kit for PGT25 LTP to HiFlow
- Control panel software/hardware upgrade
- Enclosure and balance of plant modifications (inlet system duct, inlet plenum repositioning, filter house, etc.)

The following items will be evaluated on a case-by-case basis:

- Driven equipment rating (load coupling, gear box, etc.)



GE imagination at work