



**Rolls-Royce**

# The Trent 60

For power generation and mechanical drive



## Trent 60 gas turbine

### The most advanced aero-derivative gas turbine

**The Trent utilizes the best in Rolls-Royce aerospace technology to create the most powerful, pure aero-derived gas turbine on the market today. Designed for industrial use in both power generation and mechanical drive applications, the Trent 60 has established a new benchmark for power output, fuel economy and cost savings.**

In addition to the unmatched power and efficiency of the Trent 60, customers also experience the benefits of its flexible operation, making it suitable for a variety of applications. Fast delivery and installation of equipment also provides a quicker return on investment for Trent 60 customers.





## Power generation and mechanical drive

### Flexible operation for a variety of applications

#### Power Generation

One of the most efficient gas turbines on the market, the Trent 60 provides up to 66MW in simple cycle service at 42.5 percent efficiency. Its cold start capability and high cyclic life allow it to add power to the grid very rapidly to compensate for the fluctuations and variability of renewable and other power sources, making it ideal for peaking markets.

#### Key Features for Power Generation

- Meets stringent 25ppm NOx requirements
- Power generation at 50 or 60 Hz without a gear box
- Electric start motor: 175kW and 215kW peak
- Full train black start with 350kW on gas fuel, 450kW on liquid fuel
- High cyclic life meets daily peaking market
- Cold start to full power in under 10 minutes
- Designed for ease of installation and maintenance

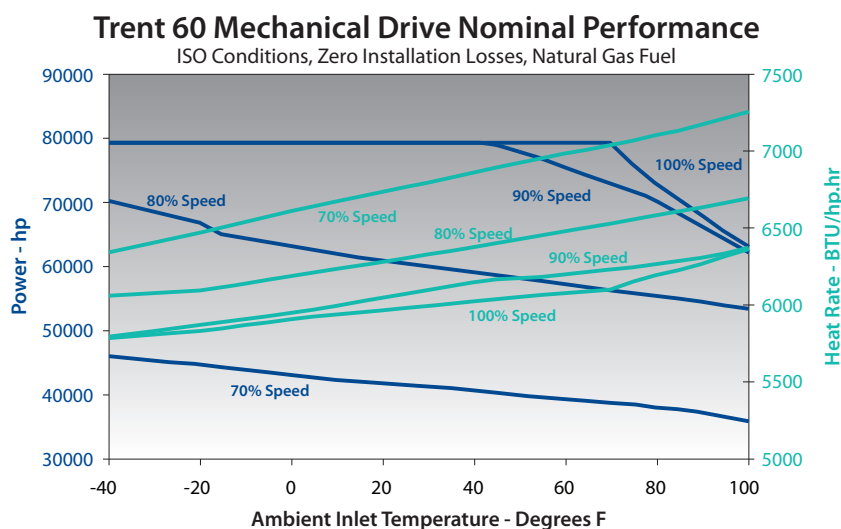
#### Mechanical Drive

The Trent 60 is ideally suited to meet the higher power, variable speed demands required by applications such as natural gas liquefaction, gas transportation, and gas induction for oil recovery.

Due to its three independent shaft design, the Trent 60 is capable of meeting driven equipment power demand at reduced speeds with minimal drop off in efficiency.

#### Key Features for Mechanical Drive

- Designed for 100 percent speed of 3,400 rpm
- Can directly connect to driven equipment or use a gear box
- Controls system supports a variety of driven equipment
- Speed range of 70 to 105 percent
- Low starting power requirements for large trains
- Multiple daily starts with no extended wait time



# Trent 60 performance data

For power generation applications

## Trent 60 – Dry Low Emissions (DLE)

The Trent 60 DLE engine is designed to meet stringent environmental requirements. The use of eight radial staged combustors allows the successful operation of the engine in part load operation while still maintaining NOx and CO compliance. The engine is designed to produce 54MW of power at ISO conditions.

## Trent 60 – Wet Low Emissions (WLE)

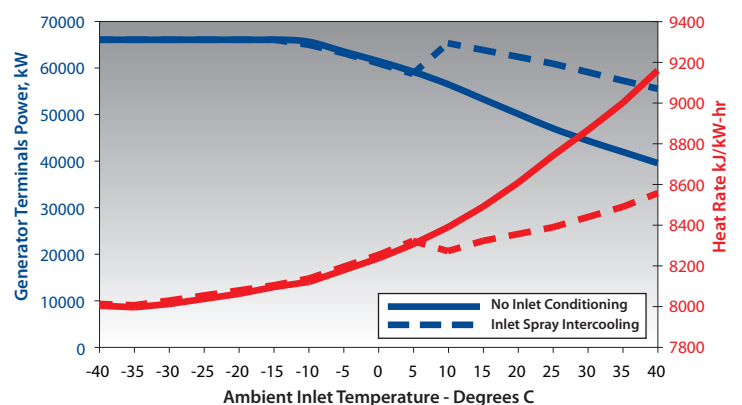
The Trent 60 WLE uses an annular combustor system from the Trent aero engine but modified to operate with liquid and gas fuel. The injection of water is used to reduce emissions and boost performance. At ISO conditions the engine is rated for 66MW.

## Inlet Spray Intercooling

The Trent 60 can be offered with an Inlet Spray Intercooling (ISI) system to reduce the ambient inlet temperature and decrease the energy required for compression. This results in higher power and efficiency at ambients above 7° C.

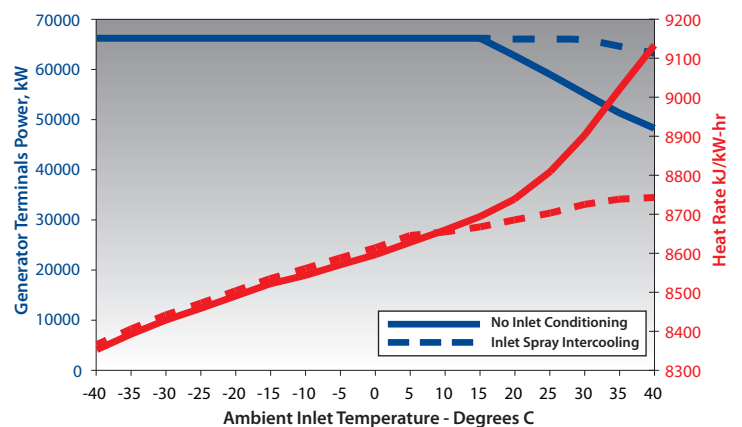
### Trent 60 DLE Nominal Performance

ISO Conditions, Zero Installation Losses, Natural Gas Fuel



### Trent 60 WLE (Water Injected) Nominal Performance

ISO Conditions, Zero Installation Losses, Natural Gas Fuel





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## The Trent 60 package

### Modular for ease of installation and maintenance

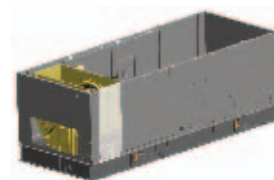
**The Trent 60 package is designed with a modular concept to allow for quick installation and ease of maintenance in the field.**

Each of the modules is fully assembled and tested before shipment. The gas turbine base plate holds the required oil system to allow installation, testing and flushing in a shop environment. This greatly reduces site installation time.

The control system is designed to allow for easy site installation by using remote I/O technology to decrease the number of interconnect cables between the unit control panel and the equipment skids. All train control systems are then accessed by a Human Machine Interface (HMI) which can be located in the main control room.

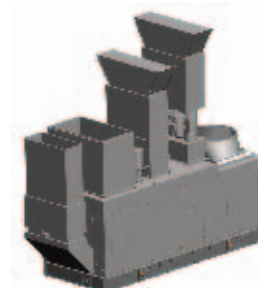
#### Step One

Install the main gas turbine skid baseplate. This includes all required engine lubrication and fuel systems as well as the remote I/O module.



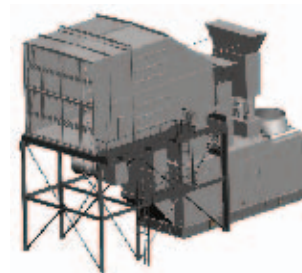
#### Step Two

Install the gas turbine enclosure roof, ventilation system, and exhaust transition.



#### Step Three

Install air filter and support structure.



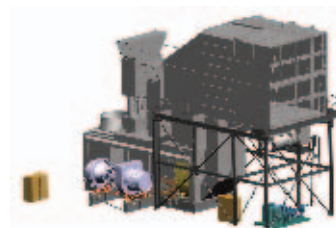
#### Step Four

Install auxiliary equipment skids.



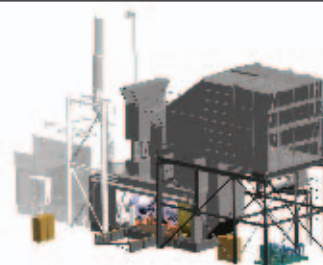
#### Step Five

Install Trent 60 gas turbine.



#### Step Six

Install driven equipment. This can be done concurrently with the other steps.



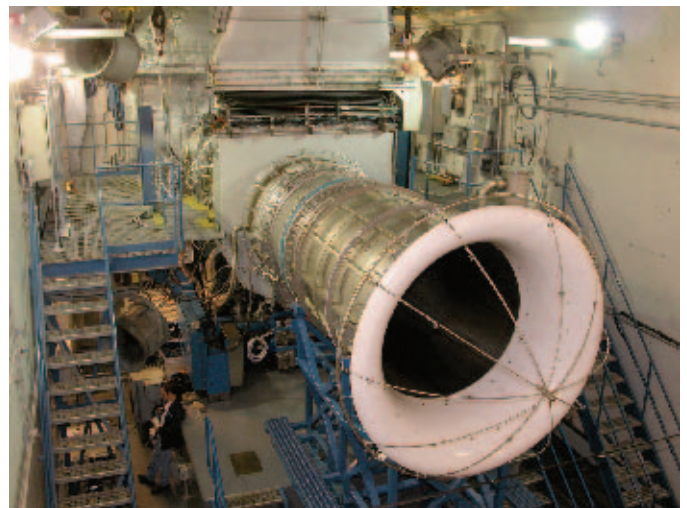


## Trent 60 maintenance

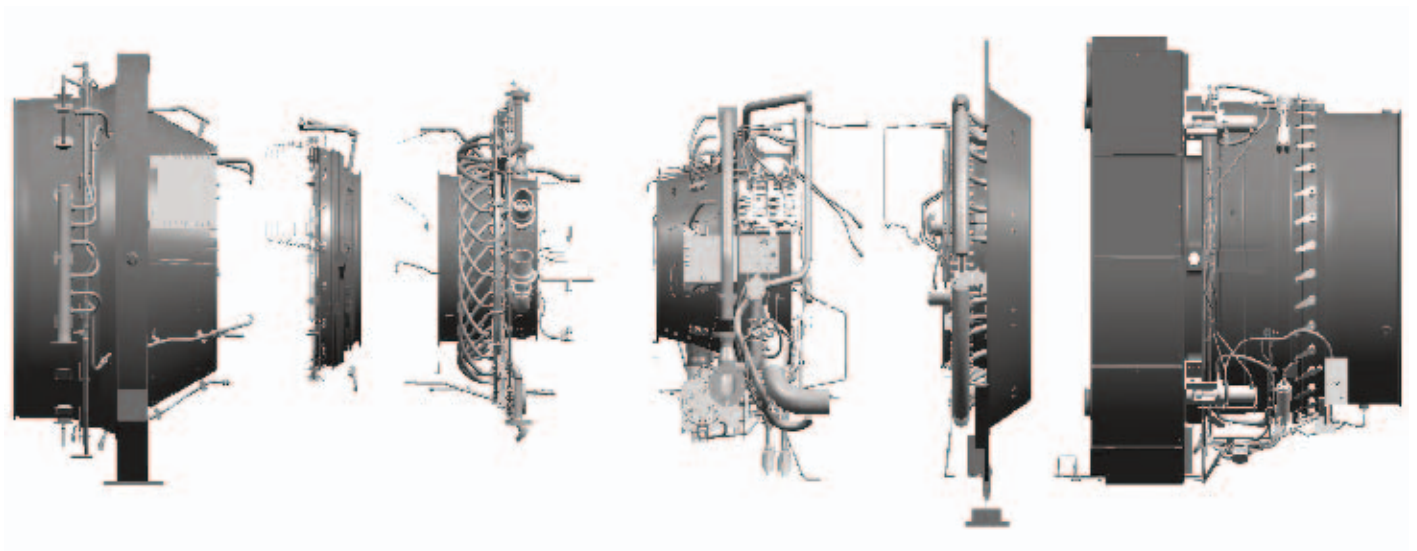
### Quick and easy maintenance

**Maintenance of the Trent 60 engine can be accomplished quickly and easily due to the Trent's aero engine design. The Trent package can facilitate engine change out in under 24 hours of working time. Complete engine servicing can take place in a Rolls-Royce facility.**

Rolls-Royce can also offer access to a lease engine or module program. The modular design of the Trent engine can allow for rapid exchange of components, while detailed work is carried out at a major overhaul facility. This can greatly reduce the turn time for engine maintenance at overhaul. Rolls-Royce can also offer access to a lease engine to support customer operations during maintenance.



**The Trent 60 engine on a test bed in Montreal, Canada**





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## Comprehensive customer service

### Experience holds the key to success

**As the most powerful aero-derivative gas turbine in its class, the Trent 60 offers distinct advantages to the power generation and oil and gas industries. This competitive advantage is complemented by an innovative and diverse suite of service solutions tailored to customers' specific needs.**

Our ability to keep customers operational is a direct result of our focus to develop customized service solutions for their business. Our TotalCare® service solutions create partnerships designed to share risk and help control operators' maintenance budgets while maximizing production.

This is accomplished through aligned metrics, priority service and support, and performance and availability guarantees. Utilizing Equipment Health Management (EHM), we can also diligently monitor equipment performance, avoid or minimize unscheduled maintenance, and increase the time between routine overhauls to consistently maximize its life cycle operational efficiency.

- Installation & commissioning services
- Spare parts
- Field services
- Technical support
- Customer training
- Repair and overhaul
- Lease and spare engines
- Long term service agreements
- Equipment upgrades
- Package refurbishments



**UK power plant utilizes the efficiency and flexibility of the Trent 60**

Other service options include on-site resident engineers, lease and exchange engine support, spare parts inventory management, and protection against unscheduled maintenance costs.

As equipment continues to operate over time, we are also constantly offering upgrades as part of our suite of Engineered Solutions. These provide the latest technology to maximize output, efficiency, reliability and minimize maintenance, operational costs and emissions.

