

Service Package 6 upgrade for SGT5-4000F Gas Turbines

Performance Enhancement – Gas Turbine

Our top priority at Siemens Energy is to provide outstanding, responsive service solutions to help improve your operating plant competitiveness and profitability. Renowned for their high availability and reliability rates, Siemens gas turbine upgrade products also have a reputation for generating high power output at low emissions.

One of the innovative solutions offered by Siemens Energy Service to help improve the performance and flexibility of your gas turbine and to help you to meet the changing market requirements is the Service Package 6 upgrade.

Our product

The Service Package 6 upgrade combines proven technology upgrades including improved turbine blading design and enhanced combustion technology. As Original Equipment Manufacturer, Siemens has introduced its extensive field experience and comprehensive engineering evaluation into the development of the Service Package 6. This Service Package upgrade typically includes a turbine performance upgrade modifying key compressor and turbine components and hot gas parts, designed to allow a significant firing temperature increase. This modernization has been designed to help yield a power increase, heat rate improvement and additional exhaust energy.

In addition, this service upgrade provides the foundation to further enhance the operational flexibility of your gas turbine and performance advantages that may result in financial benefits and offers attractive financial payback options.

Your benefits

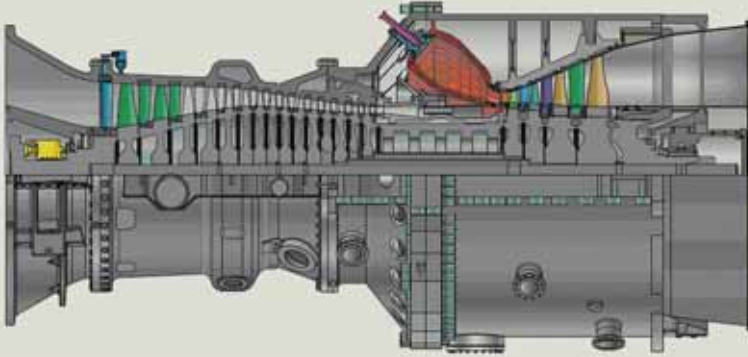
The Service Package 6 upgrade can offer you a clear and quantifiable technical and monetary benefit and can be a cost-effective means to help improve the overall performance of your gas turbine and combined cycle power plant by integrating various technical solutions.

Benefits can include:

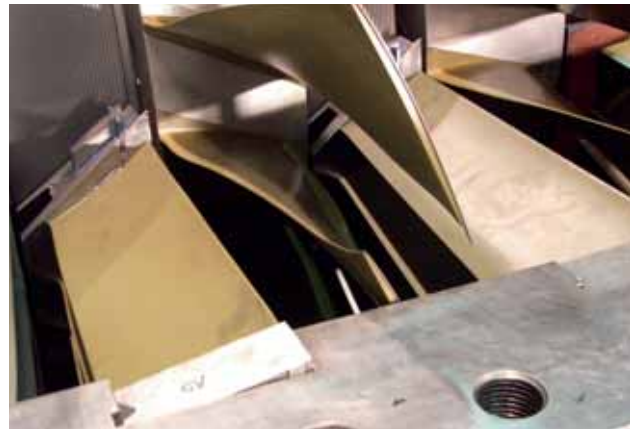
- More operational flexibility for intermediate and cyclic operation
- Increased gas turbine power output of up to 3 % in simple-cycle operation*
- Higher combined cycle power output
- Increased gas turbine efficiency of up to 0.5 %-pts. in simple-cycle operation*
- Increased part load efficiency
- Lower fuel consumption costs
- Reduction of NO_x and CO₂ emissions during part and base load operation at constant turbine inlet temperatures
- Reduction of sulfur deposits inside the burner fuel gas system typically at fuel gas preheating temperatures higher than 60°C.

The Service Package 6 upgrade is a state-of-the-art service offering for new Siemens gas turbines of the SGT5-4000F (V94.3A) frame, manufactured since 2008.

* Subject to specific technical plant evaluation, expected values with test tolerances @ ISO condition.



Schematic illustration of the Service Package 6 upgrade



Optimized compressor blades and vanes

Scope of supply

The Service Package 6 upgrade is just one of the many innovative modernization packages available from Siemens. The scope of this upgrade includes optimized hot gas path, turbine and compressor components including instrumentation and control modifications.

Depending on the actual gas turbine configuration, the optimized hot gas path and turbine components may include:

- Turbine blades stages 1 and 2
- Turbine vanes stages 1, 2, 3 and 4
- Turbine ring segments and turbine vane carrier with modified cooling holes for turbine leakage air reduction
- Improved metallic heat shield design
- Cooling air reduced combustion chamber with improved cooling air pattern, new impingement cooled tile holders and optimized ceramic heat shields
- Premix-Pilot burner and diagonal swirler with reduced swirl

Optimized compressor components may include:

- New inlet guide vane
- Compressor blades and vanes stages 1 and 2
- New hydraulic inlet guide vane actuator and position sensor
- New combined axial and radial compressor bearing with hydraulic axial shifting device and required hydraulic pump skid

In addition, the Service Package 6 upgrade may include modified auxiliary systems for the inlet guide vane adjusting device, the hydraulic clearance optimization, the two stage burner operation and the fuel gas preheating equipment.

Siemens Energy Service offers a full range of field service capabilities to help you manage your maintenance and outage schedules.

The Service Package 6 upgrade is retrofitable and applicable for the SGT5-4000F (V94.3A) frame. We recommend installing this upgrade at a major outage. The Service Package 6 upgrade may be combined with other modernizations like the Advanced Stability Margin Controller or the Fast Load Gradient Upgrade.

References

Since the first time application in 2008 more than 40 gas turbine units in operation worldwide have been using the Service Package 6 technology. These units have logged more than 450,000 equivalent operating hours (EOH).**

We provide products and services to support your goal of maximizing your return on investment.

** As of September 2013

Published by and copyright © 2013:
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Energy Service Division
Order No. E50001-G500-A146-X-4A00
Printed in Germany
Dispo 34805, c4bs No. 7816, 7821
TH 258-130853 WÜ 461409 DB 09132.

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