

SGT-700 Performance Enhancement

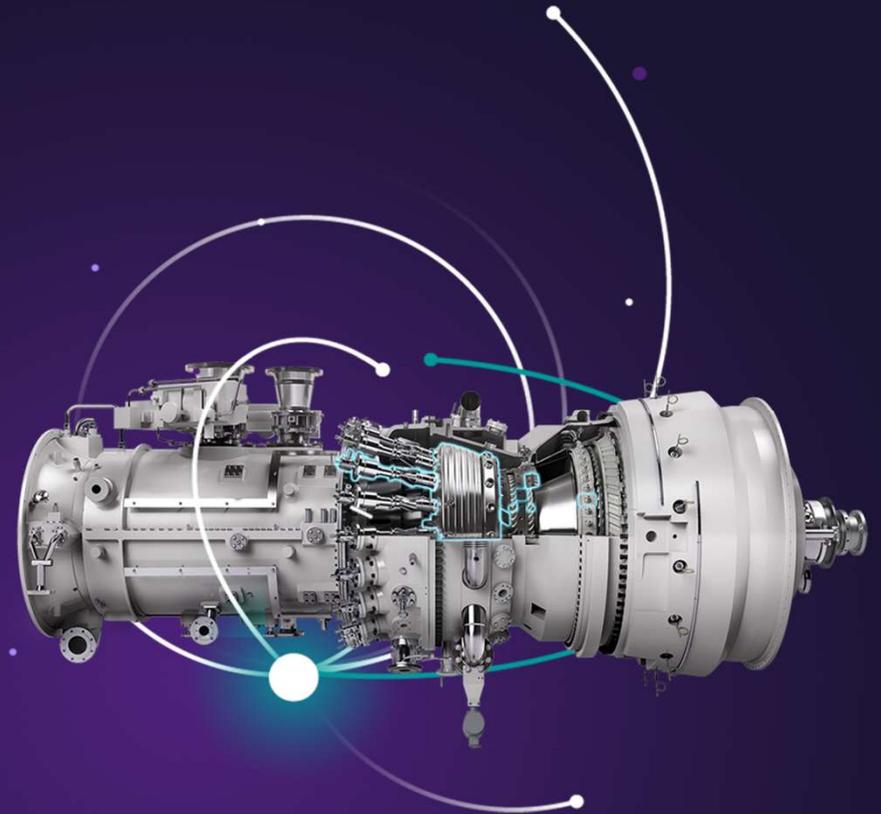
33MW rating

SB05/2016/SGT-700



SGT-700 Performance Enhancement

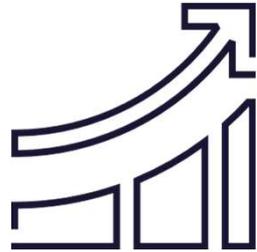
33MW rating



Benefits



Improved output (MW)



Improved efficiency



Improved input data for
combined cycle operations



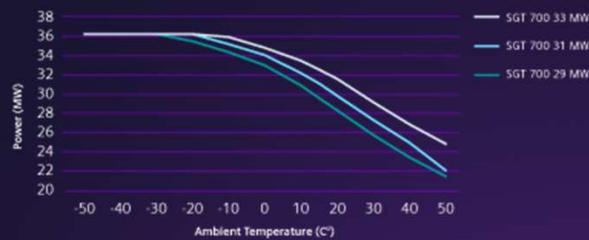
Simple to upgrade

**Power,
performance,
profitability**

Background

- During 2011, Siemens Energy released the latest version of the SGT-700 core engine rated at 33MW
- This performance enhancement is now developed for implementation into the existing fleet.
- All SGT-700s of the 29MW and 31MW rating are therefore applicable for upgrade to the 33MW core engine rating

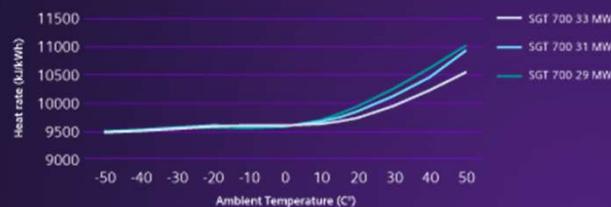
Comparison SGT-700
Output Power (electrical) as function of Ambient Temperature*



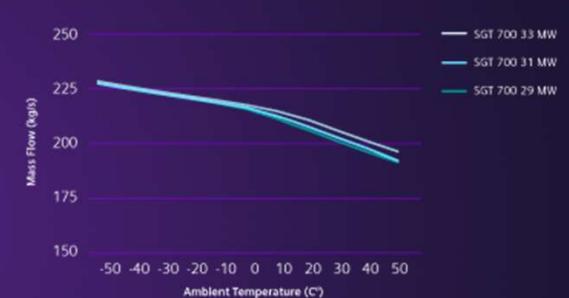
Comparison SGT-700
Power turbine outlet Temperature as function of Ambient Temperature*



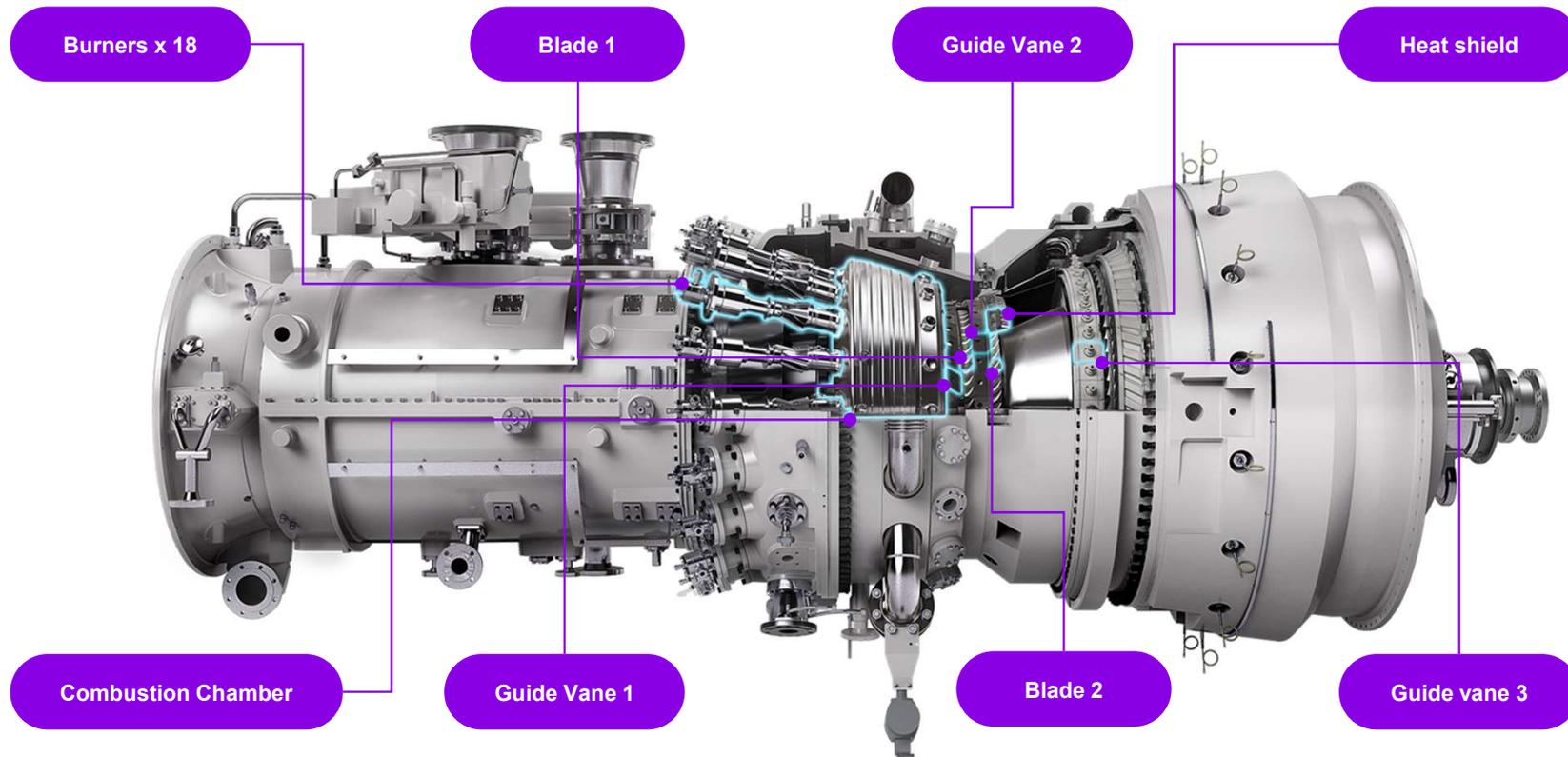
Comparison SGT-700
Heat rate (electrical) as function of Ambient Temperature*



Comparison SGT-700
Power turbine outlet Mass Flow as function of Ambient Temperature*



What is upgraded



What is upgraded

Burner

- Burner tip design is improved with better cooling and better pilot flame stability
- Optimized main gas distribution with expected better emissions



What is upgraded

Combustor

- Improved heat shield cooling
- Optimized cooling of outer liners
- Increased thickness of TBC



What is upgraded

Vane #1

- Reduced diameter and number of cooling holes
- TBC on airfoil and platform

Blade #1

- TBC on airfoil and platform
- New core with separate LE cooling channel



What is upgraded

Vane #2

- Closed angle to improve performance

Blade #2

- TBC on airfoil and platform
- Shroud removed



What is upgraded

Heat Shield 2

- New design because of shroudless blade 2
- Abradable coating for minimized tip clearances

Turbine Vane #3

- Addition of oxidation coating



What is upgraded

Control System

- Raising firing temperature
- Adjusting associated control set points



Implementation

Engineering pre-study

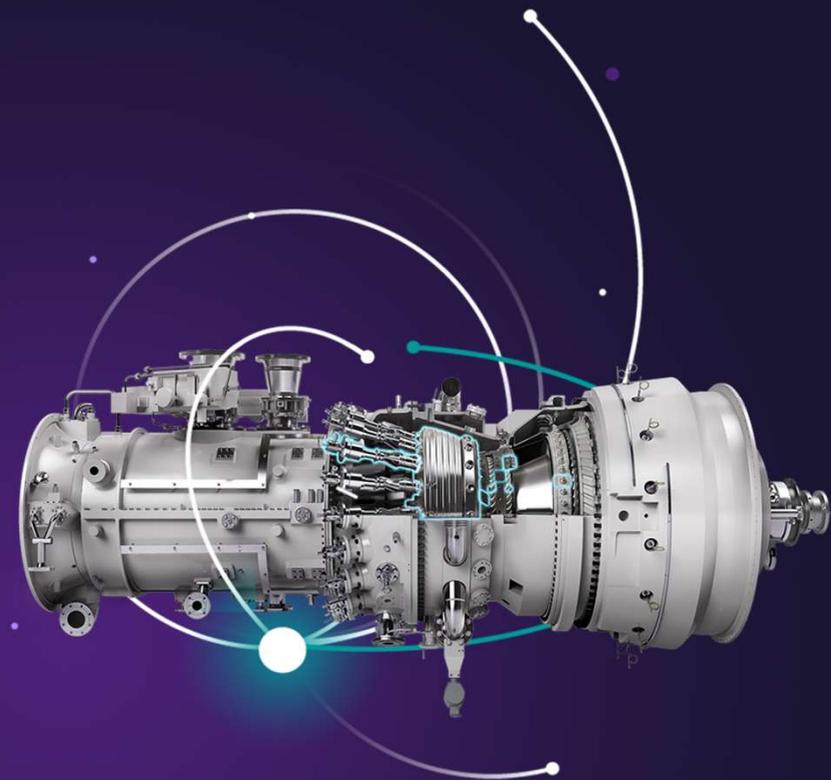
- Status determination of Gas Turbine and expected performance improvement at customer operating conditions
- Review auxiliary system cooling capacity (e.g. lube oil, seal air)
- Downstream equipment capacity (e.g. AC generator)

When to perform enhancement?

- Insert enhancement parts at any major inspection?

Performance evaluation for Power Output

- Based on operating instrumentation before and performance evaluation after
- Performance test before and after for efficiency evaluation



“This cost-effective and simple retrofit approach ensures facility down-time is minimized, while performance, power and operator profitability are optimized.”

“Over the course of a year, a 10% power increase can result in large-scale profit increases, making for a rapid Return on Investment for this upgrade package.”

Disclaimer

Subject to change and error. The information given in this document only contains general descriptions and/or performance features which may not always specifically reflect those described, or which may undergo modification in the course of further development of the products. The requested performance features are binding only when they are expressly agreed upon in the concluded contract.

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