

SGT-700 Performance Enhancement

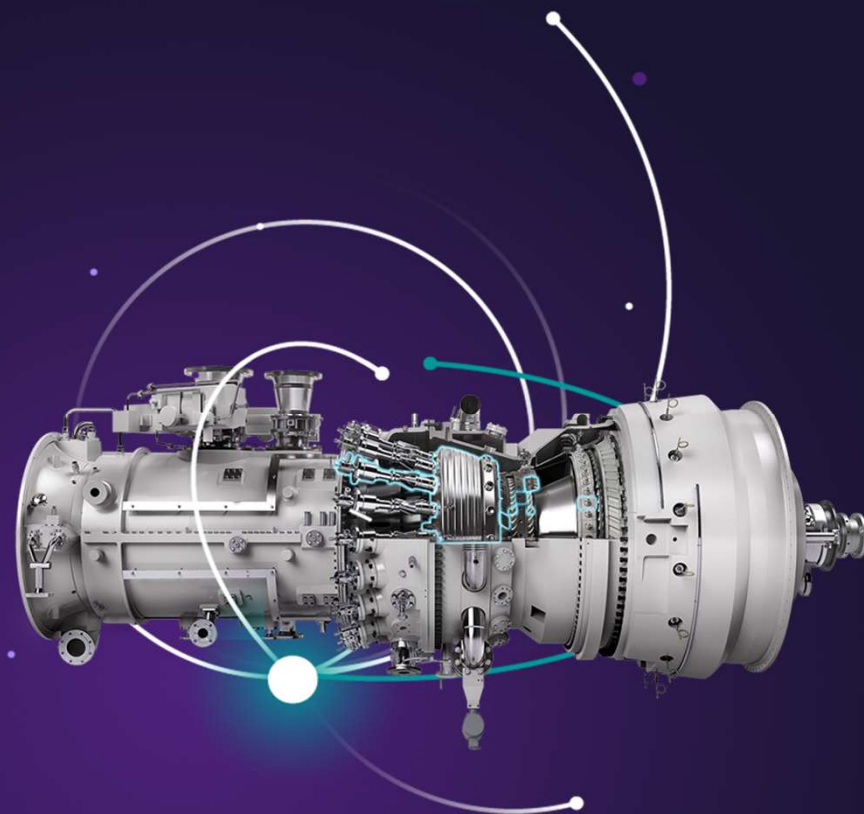
33MW rating

SB05/2016/SGT-700



SGT-700 Performance Enhancement

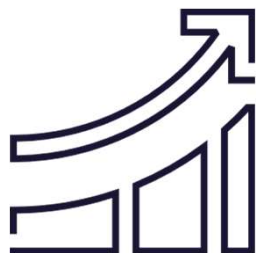
33MW rating



Benefits



Improved output (MW)



Improved efficiency



Improved input data for
combined cycle operations



Simple to upgrade

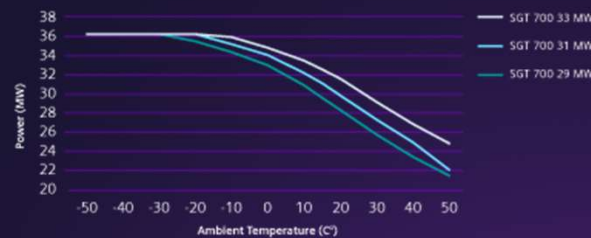
**Power,
performance,
profitability**

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*



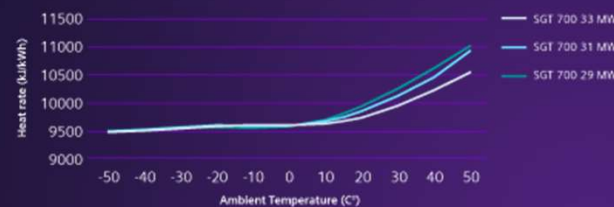
Comparison SGT-700

Power turbine outlet Temperature as function of Ambient Temperature*



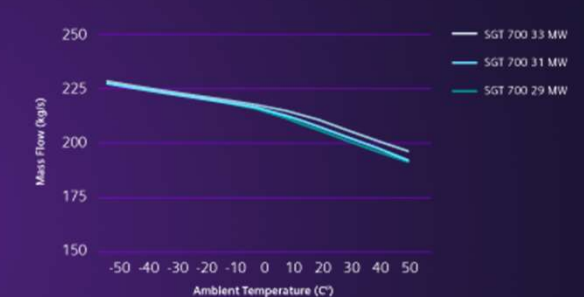
Comparison SGT-700

Heat rate (electrical) as function of Ambient Temperature*

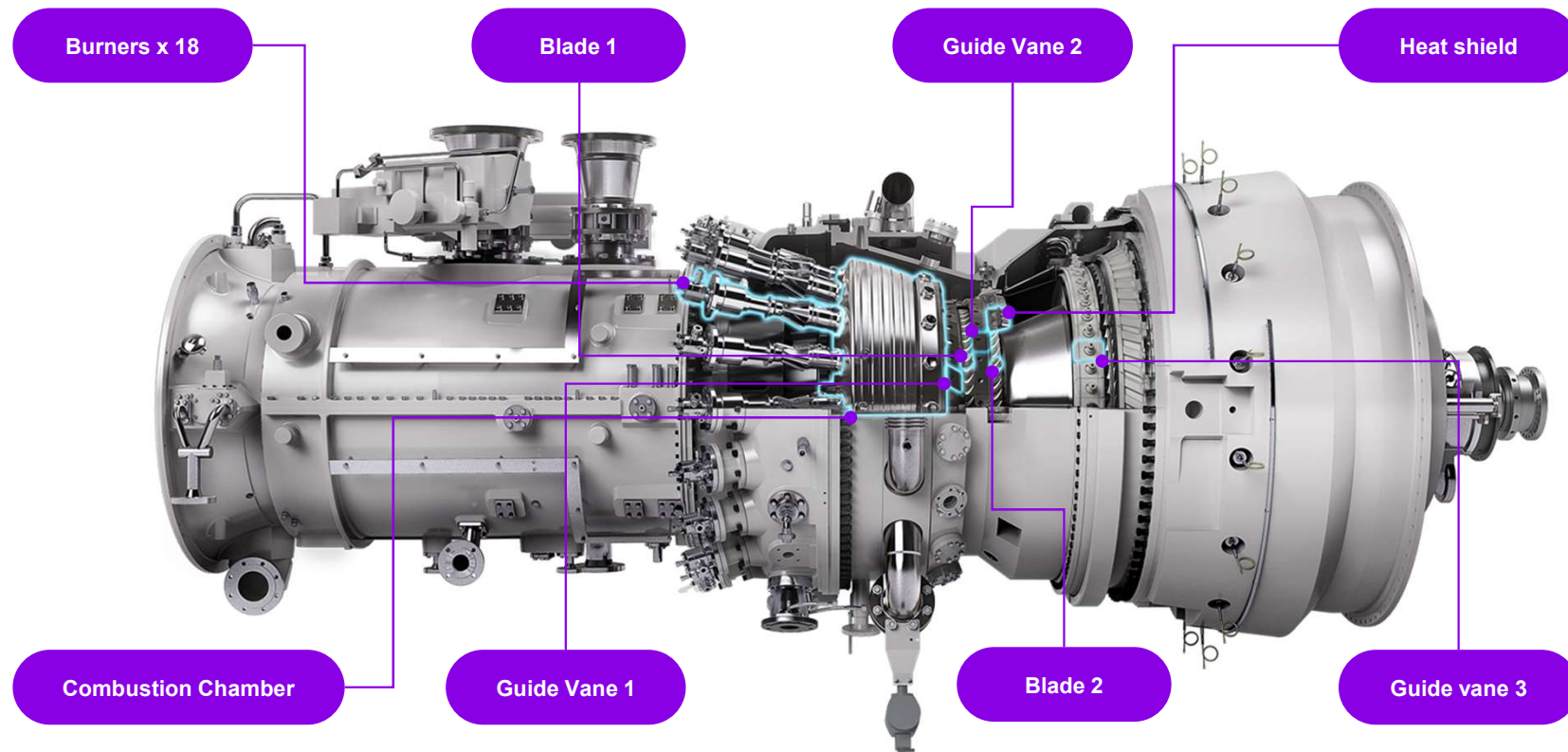


Comparison SGT-700

Power turbine outlet Mass Flow as function of Ambient Temperature*



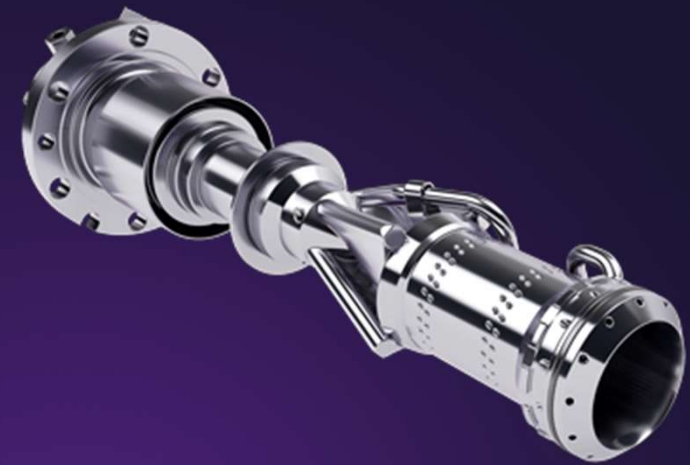
What is upgraded



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



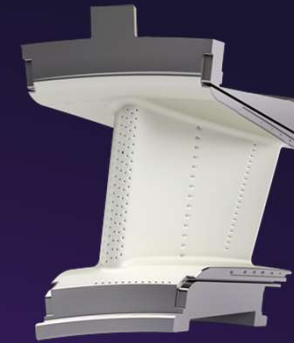
What is upgraded

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

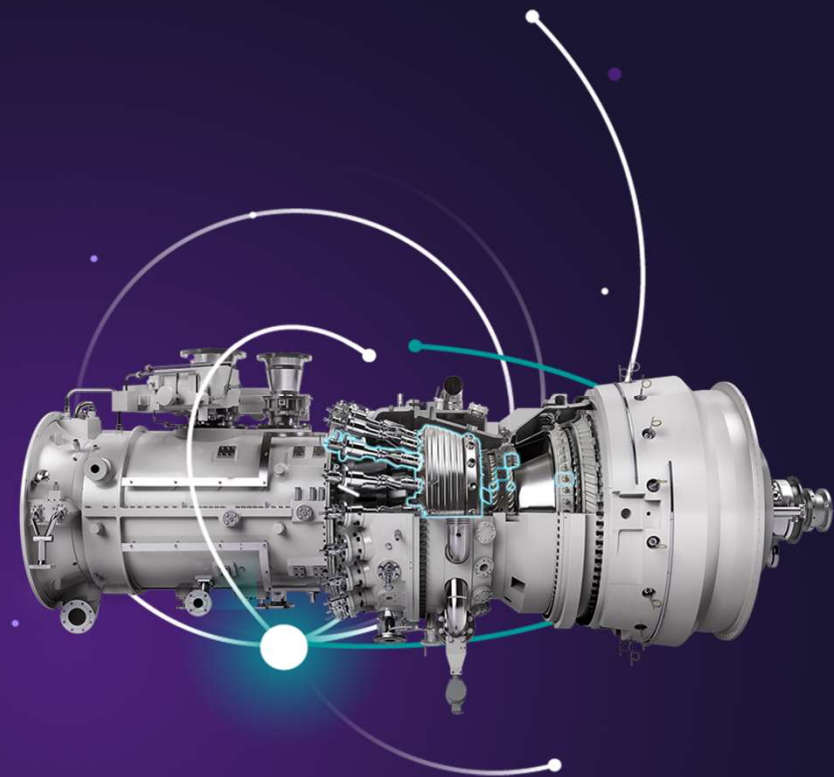
- Status determination of Gas Turbine and expected performance improvement at customer operating conditions
- Review auxiliary system cooling capacity (e.g. lube oil, seal air)
- Downstream equipment capacity (e.g. AC generator)

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

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