

# Fast Wet Compression for Siemens Gas Turbines

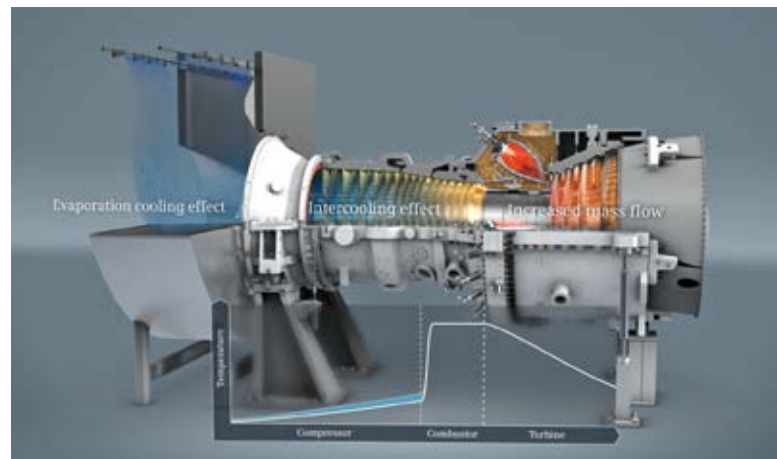
## Performance Enhancement – Gas Turbine

Our top priority at Siemens is to provide outstanding, responsive service solutions to help you improve your operating plant competitiveness and profitability. The global energy markets are rapidly changing due to increasing renewable power generation. This leads to higher flexibility requirements for many fossil power plants.

To answer this demand, Siemens developed Flex-Power Services™ to offer you solutions for a wide range of aspects of the changed operational requirements, such as power on demand and grid services. As part of Flex-Power Services™ the Fast Wet Compression upgrade can help increase your plant's operational flexibility.

### Our product

Fast Wet Compression is a consistent further development of our successful Wet Compression upgrade. While Wet Compression was developed to optimally generate additional power, Fast Wet Compression is designed to provide additional power in a very short time. It supports the operational flexibility by using this peak power for grid code requirements. With the Fast Wet Compression System, liquid water is injected in the gas turbine inlet duct in order to cool down the gas turbine inlet air flow by evaporation. Since the water is not evaporated completely in the inlet duct, liquid water is ingested into the compressor which leads to additional inter cooling of the compression process. This is intended to reduce the power consumption of the compressor and consequently increase the power output of the gas turbine.

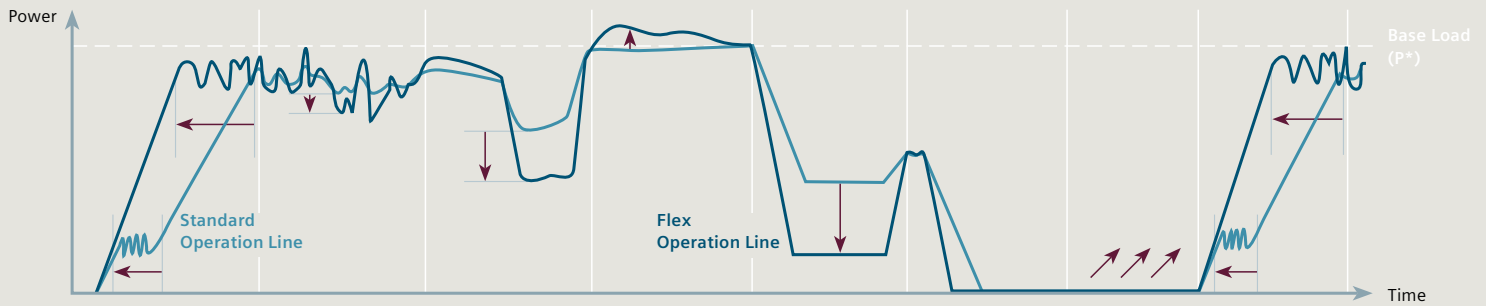


Schematic representation of the Fast Wet Compression System



Flex-Power Services™

## Aspects of Flex-Power Services™



Power on Demand	Grid Services		Min. Part Load	Maintenance Flexibility / Power on Demand
Start Performance	Load Gradients	Peak Power	Emissions	Intervals & Cool Down / Start Performance

### Fast Wet Compression as part of the Flex-Power Services™\*

#### Your benefits

The Fast Wet Compression upgrade can offer you a technical and economic benefit and can be a cost-effective means to help you improve the overall performance of your gas turbine plant.

The Fast Wet Compression upgrade may include the following benefits:

- Power increase of up to 17 MW in simple-cycle operation
- Power on demand for peak load application as well as for secondary frequency response or BLOC (Base Load off Frequency Characteristic) requirements
- Higher exhaust energy for increased steam production
- Increased operational flexibility
- Operation closer to base load therefore at a higher efficiency level while the whole frequency response reserve is preserved
- Increased amount of secondary frequency reserve

The Fast Wet Compression upgrade is applicable for the SGT5-4000F (V94.3A) and may be combined with other modernization products. The combination of Fast Wet Compression and the Turn Up upgrade, for example, can be even more beneficial since both upgrades deliver additional power and support peak power as well as grid code compliance.

#### Scope of supply

The Fast Wet Compression from Siemens is just one of the many innovative packages available. The scope of this upgrade includes:

- Compressor inlet water distribution system with nozzles
- Inlet duct treatment
- Fast Wet Compression pump skid
- Interconnecting piping between pump skid and distribution system
- Modification of existing control logic

We recommend implementing the Fast Wet Compression upgrade at an extended hot gas path inspection or a major outage. We offer a full range of field service capabilities to help you manage your maintenance and outage schedules.

#### References

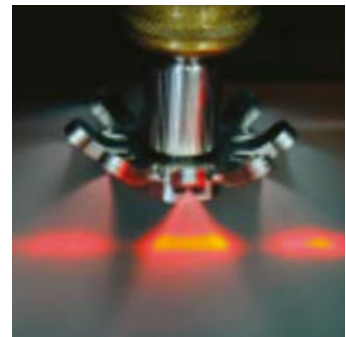
Siemens successfully implemented Fast Wet Compression in 2009. More than 50 units are equipped with the proven Wet Compression or Fast Wet Compression product.\*\*)

Fast Wet Compression forms part of the Flex-Power Services™.

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

\* Conceptual illustration only

\*\* As of July 2015



Spider Nozzles

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