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Head Of The H-Class

Recent orders highlight the factors considered by Siemens Energy in the development of its H-Class gas turbine SGT-8000H series

Siemens has received new orders for its H-Class gas turbine series. Among them, three additional SGT6-8000H gas turbines and generator packages will be delivered to Florida Power & Light (FPL) in Florida, U.S.A. A subsidiary of U.S.-based NextEra Energy Inc., FPL serves the third-most customers of any American electric utility with approximately 4.6 million accounts. FPL will install the gas turbines to modernize its Port Everglades Next Generation Clean Energy Center with the goal of cutting fossil fuel consumption by one-third. The

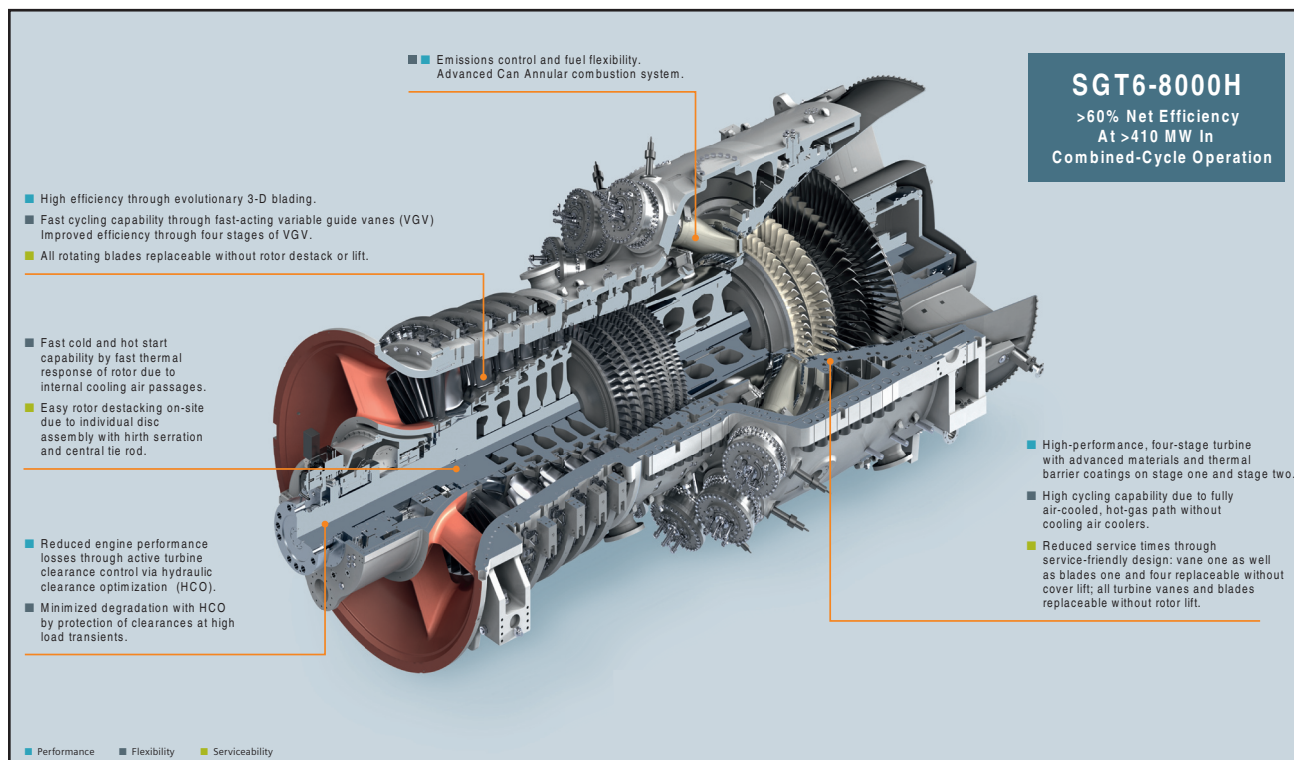
combined-cycle power plant (CCPP) is expected to start operation in 2016.

With the orders already received for FPL's combined-cycle Cape Canaveral and Riviera Beach Next Generation Clean Energy Centers, Siemens has sold nine of its H-Class gas turbines in the U.S.A., while the total number sold worldwide has increased to 20.

The first three of the previously ordered six Siemens H-Class gas turbines were successfully started in November/December 2012 and are now in hot commissioning at FPL's Cape Canaveral Next Generation Clean En-

ergy Center in Port St. John, Florida, U.S.A., near NASA's Kennedy Space Center. Three more SGT6-8000H gas turbines are also now being installed at a similar plant under construction in Riviera Beach, Florida.

The SGT6-8000H is the scaled 60 Hz version of Siemens' SGT5-8000H gas turbine, which the company said made power plant history in May 2011. Installed in a combined-cycle power plant configuration at the Irching Power Station Unit 4 in Bavaria, Germany, the company said its SGT5-8000H achieved in combined-cycle operation



world-record efficiency of 60.75% (net) with an output of more than 578 MW.

The SGT6-8000H gas turbine is designed to produce 274 MW of electric power and is likewise capable of reaching efficiencies topping 60% in combined-cycle operation, Siemens said.

The turbine's improved efficiency means it not only consumes less fuel/kWh, but also emits less nitrogen oxide and carbon dioxide. When the turbine goes into combined-cycle operation in Florida, the company said it is expected to emit 40 823 tonnes less carbon dioxide when compared to current combined-cycle plants.

Siemens said the H-Series is fully air-cooled, resulting in the ability to start fast and cycle quickly in combination with advancements on the plant and balance of plant side, resulting in high operational flexibility. It supports intermediate load requirements with improved turndown capability for high efficiency and low emissions part-load operation; reduced complexity, leading to lower maintenance and operating costs; improved materials to increase firing and exhaust gas temperatures; and a sealing system for low leakage cooling air.

"The 60 Hz version of the H-Series will contribute significantly to clean power generation in Florida and serve as yet another example of FPL's leadership among U.S. utilities," said Michael Suess, member of the Siemens AG Managing Board and CEO of the company's Energy Sector.

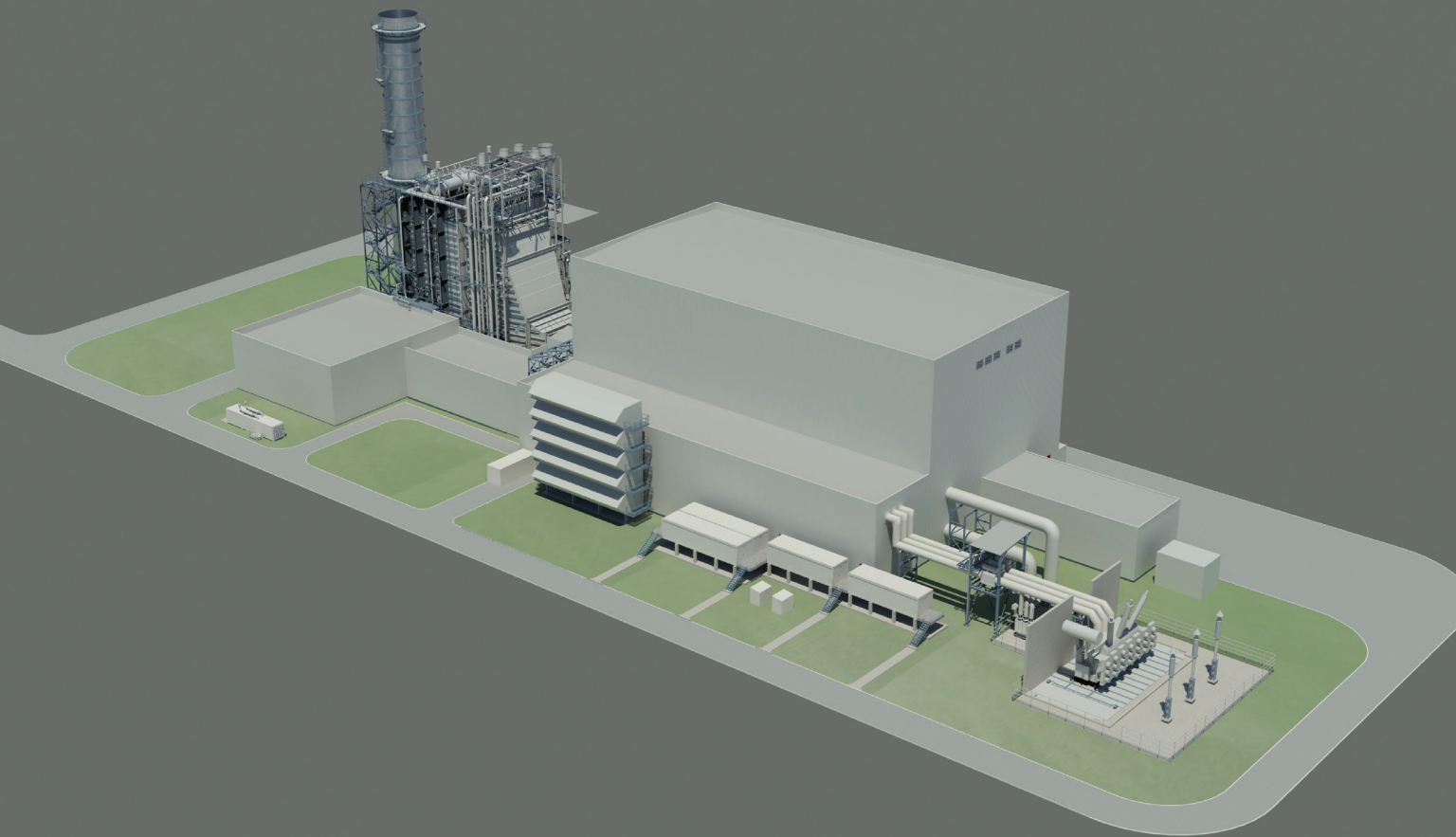
With the ignition and first fire of the SGT6-8000H in spring 2013, the Siemens H-Class technology officially starts its operation in the Asian Pacific Region. Siemens said the 60 Hz CCPP Bugok 3 plant incorporates some of the most advanced features available today in combined-cycle technology, producing over 415 MW on one shaft. The plant is capable of an efficiency of well over 60% with very advanced steam conditions. At the same time, it has immense operational flexibility, the ability to hot start in less than 30 minutes and deload quickly, and also can provide frequency response capabilities, the company said. Siemens is building this plant turnkey in consortia with GS EPS. Siemens is supplying the SGT6-8000H gas turbine, an SST6-5000 steam turbine, a hydrogen-cooled generator SGen6-2000H, a BENSON HRSG, as well as electrical equipment

and the SPPA-T3000 instrumentation and controls system. A long-term maintenance agreement was also concluded for the main components.

In addition to Bugok 3, Siemens sold in 2012 a further six H-Class orders for CCPP projects in South Korea: Andong CCPP; Ansan CCPP; POSCO units 7, 8; and Daegu City CCPP.

In Europe, Siemens secured two new plant orders with the SGT5-8000H gas turbine for the turnkey erection of the Lausward combined-cycle power plant with district heat extraction in Düsseldorf, Germany for Stadtwerke Düsseldorf AG. With an electrical unit output of around 595 MW and a net efficiency of over 61%, Siemens said the Lausward CCPP would set a world record for both parameters. The generated thermal energy will be used for the district heating system in the city of Düsseldorf. Siemens said that it has been previously impossible to extract 300 MWth of district heat from a single power plant unit in combined-cycle operation. Thus, the overall efficiency of the natural gas fuel will be around 85%, according to the company.

A long-term maintenance contract



Siemens will supply the key components for a 600 MW natural gas-fired, combined-cycle power plant close to the city of Samsun on the Turkish coast of the Black Sea.

for the main components has also been signed. This new plant will be playing an important role in achieving the objectives of the energy turnaround and climate protection in Germany.

Siemens also received a US\$391 million order — which includes a long-term service contract — to supply the key components for a natural gas-fired, combined-cycle power plant close to the city of Samsun on the Turkish coast of the Black Sea. The customer is Cengiz Enerji, an independent power production company, which will build and operate the plant. After commissioning at the beginning of 2015, the plant will have an installed capacity of

approximately 600 MW, a gross efficiency of almost 61%, and be the most efficient and most environmentally friendly gas-fired power station in Turkey, the company said.

Turkey's energy demand is continuously growing: The annual increase rate of electric energy consumption has been an average of 7 to 8% for many years. Additionally, the Turkish power plant market is developing dynamically and is subject to stiff competition.

The plant's core component is the H-Class gas turbine, and Siemens' scope of supply includes the steam turbine and the generator as well as

the instrumentation and control system. The plant is designed for 250 starts/yr and will be capable of reacting very quickly to grid fluctuations as the output could be varied by more than 35 MW/min, the company said. Flexibility is an important factor, particularly in countries that intend to integrate a growing amount of renewable energy sources in their power mix.

"Turkey is on a growth path," said Hüseyin Gelis, CEO Siemens Turkey. "We are pleased that our technology will make a significant contribution to a reliable, affordable and environmentally sound energy supply." 