

Cleco – Evangeline Power Station, St. Landry, Louisiana GTE’s Multi-Stage Compressor Cleaning System on Siemens SGT6- 5000F (W501F)

CLIENT PROFILE



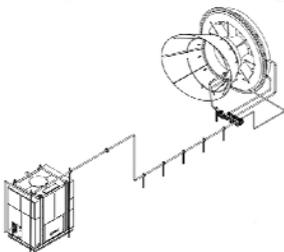
Evangeline Power Station, Cleco's first unregulated power plant, is located in St. Landry, La., in Evangeline Parish.

<http://www.cleco.com/>

Plant Manager: Joe Sepulvado
O&M Supervisor: Mike Bishoff

QUICK READ

- 1% performance recovery
- 0.5% heat rate recovery
- ROI in less than 6 months
- Similar systems available on most industrial gas turbines



► CHALLENGE

Cleco Evangeline, an intermediate load following power plant, is located in rural, central Louisiana and is the Siemens LTP SGT6-5000F (W501F) class engine operational hours fleet leader. The engines experience compressor fouling from seasonal, environmental and agricultural conditions, such as pollen and prescribed burning of local sugarcane and cotton fields, resulting in loss performance.

Cleco has three combined cycle SGT6-5000F engines. All three engines burn natural gas and are only used for power production. The engines run heavily during peak seasons and are generally shutdown at night. Cleco experiences intermittent LFD issues with the OEM wash system. Therefore, on-line washing is performed prior to shutdowns or during non-peak hours for risk mitigation of potential penalties. On-crank washes are performed during scheduled outages.

Prior to GTE's involvement, Cleco used the OEM supplied gas turbine compressor water wash system for on-line and on-crank washing on all of their engines.

► STRATEGY

GTE started a rigorous R&D program with Cleco that encompassed a two year testing period. GTE obtained on-line and on-crank nozzle spray patterns for different nozzle sets, engine performance data, system reliability data and operator feedback, for an optimized design.

The GTE test system was specifically installed on unit 7-1, which is part of the 2-on-1 power block. Cleco evenly splits the loads between the engines. Side by side performance testing techniques were used to collect data between the GTE and OEM supplied water wash systems. Performance data could be accurately corrected as measurement uncertainty was minimized.

► SOLUTION

GTE designed a patent pending, fully automated, multi-stage nozzle cleaning system for on-line and on-crank compressor water wash.

The automatic on-line wash cleaning system offered full inlet throat coverage and optimized blade wetting for normalized engine loads from 60 – 100% providing operational flexibility. The system incorporated GTE's patented water wash technology and seamlessly integrated into the Siemens WDPF control system to promote regular on-line washing, by the operators. The engine received a dedicated wash system due to the operational constraints of washing prior to shutdown.

The semi-automatic on-crank water wash process reduced operator involvement and decreased turbine downtime. Operator involvement would only be required to open drain valves, initiate the wash, and determine adequate engine rinsing.

► RESULTS

Daily use of the on-line wash has cut the engine power degradation rate in half. In comparison to the OEM water wash system, the GTE system demonstrates an average percent power benefit of 1.18 % and an average increase in engine efficiency by 0.42 % over a four month span, between on-crank water washes.

The on-crank wash provides improved degradation recovery above and beyond the OEM water wash system. This is primarily due to complete intake coverage, heated and highly atomized water and precision controlled injection of the OEM approved additive.

Mike Bishoff, the Cleco O&M Supervisor, found the system valuable because it was an easy to use, low maintenance system that maintains power output, reduces fuel and parts cost, and has added operational flexibility.

The Evangeline Power Station plans to install this system on their other two SGT6-5000F engines. The patent pending multi-stage nozzle cleaning system is commercially available to all SGT6-5000F customers directly through GTE.