

At a glance

Location

Southern United States

Commissioned

April 2009

Fuel

Natural gas

Technologies

- UPSource that features 6 Capstone C65 Microturbines that generate up to 390kW of continuous power.
- Capstone Heat Recovery Modules installed on each microturbine use exhaust heat and specific control functions to re-use otherwise wasted energy to heat water for laboratory use.

Results

- Independent IT-grade power source with no reliance on electric utility.
- Nearly eight 9s of reliability for N+1 configurations.
- 100% up-time solution.
- On average, 20% less cost of ownership than traditional UPS in N+1 requirements.

U.S. Government Office Relies on UPSource

Microturbines have significantly lowered the chance that 120-mph hurricane winds or crippling power outages will once again shut down a key United States government office.

In the past, disasters have pummeled the office, which features a laboratory that analyzes items to ensure national security.

For years, the laboratory completely relied on electricity from the local utility to power the building and sensitive laboratory instruments.

Disaster first struck in 2005, when Hurricane Katrina destroyed the previous location. Just two years later, Hurricane Ike battered the Center's new offices. For nearly a month after Ike, surrounding homes and businesses were without utility electricity. Businesses with liquid-fueled emergency generators couldn't find replacement fuels.

After years of design engineering, a new laboratory opened in April 2009 in the Southern United States.

Needing a power source for the new laboratory more reliable than the local utility, and to gain greater control over energy costs, officials decided a change was needed. They turned to Capstone Turbine for microturbine-produced onsite power for emergencies and to reduce peak demand from the utility.

In February 2009, Capstone installed its UPSource, an independent, IT-grade power source that doesn't rely on the electrical utility and eliminates the need for large banks of DC-storage batteries.

UPSource is highly reliable. Even with the loss of a single microturbine, the Capstone installation remains a continuously running up-time



Six Capstone C65 microturbines generate continuous power at this U.S. government office.

solution with nearly eight 9s of reliability for N+1 configurations – better than those specified for most secure-data sites. Each microturbine has only one moving part; no fluids mean fewer breakdowns.

In addition, government officials can worry less about a fuel-source loss since natural gas – the microturbines' primary fuel – is traditionally more available than utility electricity in a storm or wind-driven power-loss event.

The installation at the laboratory features a total of six Capstone C65 natural gas-fueled microturbines. Two microturbines run 24 hours a day, 365 days a year, in a redundant configuration.

Four *other* C65 units operate at the laboratory in various modes to ensure the site can support laboratory staff with HVAC system power, lighting, and domestic power through an extended outage.

These four microturbines operate in parallel and synchronously to the local electric grid. The system can recognize a loss of stable utility power, immediately disconnect from the utility tie, *then* step back into a smaller and isolated set of critical loads.



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Five of the six Capstone microturbines create a combined UPS_{Source}/dual-mode installation that provides onsite electricity and a steady supply of domestic hot water to the labs, as well as building heating requirements. Each unit produces 251,000 BTU/hr (74kW) of clean waste heat used to heat the hot water.

The ICHP microturbines eliminated the need for a secondary boiler system. In addition, without the use of any additional energy costs, the system can operate at efficiencies much greater than conventional UPS systems and diesel-generator back-up systems.

As with all Capstone UPS_{Source} applications supplied in N+1 configurations, concerns of load coverage during service or single-module failures are greatly reduced.

Capstone also offers IT System Application assistance for all UPS_{Source} applications. ■