VA Ann Arbor Healthcare System

Healthcare

The Challenge

The United States Department of Veteran Affairs is committed to reduce their carbon footprint, improve energy efficiency, reduce utility expenses and provide backup power to systems in its national network of facilities.

Such was the case at Michigan's VA Ann Arbor Healthcare System (VAAAHS). The medical center campus encompasses the hospital, outpatient clinics, community living center, a radiation therapy facility, two research buildings, five administrative outbuildings, two parking garages, and an energy center.

"While power outages are relatively uncommon, the impact of one outage on a facility can be serious," says David Smith, P.E, CEM, Vice President of Engineering, for distributor, GEM Energy.

Smith references a U.S. Department of Energy report indicating the U.S. has one of the world's most reliable, affordable, and increasingly clean electric systems, but faces significant vulnerabilities from severe weather, terrorist attacks, and cyber threats.

Eaton Corporation, which tracks significant power outages nationwide, indicates Michigan is fourth in the nation in outages, having recorded 1,369 outages since 2008 affecting 10,937 customers for an average of
97 minutes.

"Hospitals are mandated to have ultra-reliable on-site power generation for critical systems. This is often a life-or-

Our facility is realizing a monthly savings of approximately $31,000, (for a total) of $370,000 per year."

— Jeff Means, Energy Manager
VA Ann Arbor Medical Center

Power Profile

Customer
VA Ann Arbor Healthcare System

Location
Ann Arbor, Michigan

Commissioned
November 2013

Fuel
Pipeline Natural Gas

Technologies
- Capstone C1000 Microturbine

Capstone Green Energy Distributor
GEM Energy, a member of the Rudolph Libbe Group

A C1000 microturbine at the VA Medical Center in Ann Arbor, Michigan provides electricity and steam to the 1.1-million-square-foot facility.

death matter," Smith says. "Long-term on-site fuel storage is mandated to guard against interruption of off-site services. This drives hospitals to employ relatively dirty generators fueled by expensive diesel fuel," notes Smith.

"These machines are restricted by environmental rules to operate only a few hours outside of actual emergencies, and only for testing. These power the most critical loads of the hospital," added Smith.

The Solution

Less critical loads such as auxiliary buildings and outdoor lighting can benefit from backup power from reliable natural gas infrastructure in addition to improving energy efficiency and reducing carbon footprint and utility expenses.

Resiliency is being provided at the VAAHS by a combined heat and power (CHP) system anchored by a Capstone Turbine C1000. The Capstone C1000 is expandable and can be paralleled up to 10 MW of power.

The system provides a net heat rate LHV of 10.9 MJ/kWh (10,300 BTU/kWh); exhaust temperature of 280 ºC (535ºF), and exhaust gas flow of 6.7 kg/s (14.7 lbm/s). The Ann Arbor system runs on natural gas and its nominal full power performance at ISO conditions is 59˚F, 14.696 psia, and 60% RH.

The system delivers electricity and steam to the 1.1-million-square-foot Ann Arbor VA facility using clean-burning natural gas supplied by the local utility.

Its integrated recovery steam generator provides more than 2,258 pounds of steam per hour at 75 PSIG.

The Capstone C1000 operates 24/7 in parallel with the local electric utility, reducing the hospital's electric bill. In a power outage, the system works with the hospital's legacy emergency diesel generators to power less critical loads.

The Results

At the VAAAHS, the C1000 is in continuous use and is serviced and maintained by GEM Energy under a 10-year full coverage Capstone Factory Protection Plan (FPP).

With the ultra-low emissions and reliable electrical and thermal generation the VA hospital is leading the effort for energy efficiency and sustainability. Its efficiency is saving approximately US$370,000 annually for the medical center.

Capstone C1000 Microturbine

A C1000 Microturbine provides up to 1MW of electrical generation and can be paralleled to generate up to 10MW of clean-and-green power.

Call us (toll free) 1.866.422.7786 | Tel: 1.818.734.5300 | www.capstonegreenenergy.com

Capstone Green Energy