



Power Generation

POWER LOFT DATA CENTER EARNS LEED GOLD

Who Power Loft I @ Innovation Data Center
What Eight MTU emergency standby power generator sets, 2,000 kW to 2,500 kW
Where Manassas, Virginia, USA

Wholesale data center provider focuses on energy savings, low environmental impact and high reliability with generator sets that are already outfitted with advanced exhaust aftertreatment or designed to readily accept it.

Data centers are big users of electric power. Rack upon rack of computer servers can consume up to 300 watts of electricity for each square foot of floor space, which adds up to a lot of electric power consumed every hour of every day, 365 days a year. In addition, servers give off that energy as heat, which must be taken away by the facility's air conditioning system. Then, to ensure customers have reliable service even during a utility outage, data facilities require a backup power system that includes UPSs and standby generators.

Power Loft I @ Innovation (“Power Loft”) is winning in the effort to reduce energy consumption and increase the sustainability of data centers. Located in Manassas, VA, Power Loft’s LEED Gold-certified facility incorporates a unique design with sustainable building features that reduce electricity demand and minimize environmental footprint.

Power Loft I @ Innovation is owned by Corporate Office Properties Trust (NYSE: OFC), an office real estate investment trust (REIT) that develops and owns data centers for more security-conscious tenants in the US Government and Defense Information Technology industries. Power Loft is unique in its ability to physically scale in modular increments of 50,000 raised square feet, and in power increments from 100 to more than 300 watts per raised square foot.

Power Loft I @ Innovation incorporates a number of energy-saving architectural designs that earned the facility a Gold LEED Certification (Leadership in Energy and Environmental Design, a program of the U.S. Green Building Council). Some of these innovations include a reflective roof, building sidewalls covered with green vegetation and a chilled-water cooling system, features that together help reduce energy use by 30 percent over traditional data centers. The standby power system for this facility is also proportionally smaller, saving both energy and construction costs. Early in the design process, Power Loft I @ Innovation selected Rolls-Royce to supply MTU standby generator sets. Even its five Hitec rotary UPS units are powered by MTU brand engines.

“We had used MTU systems in the past and were happy with them,” says Dave Ruppe, chief technical officer for Power Loft Services, LLC, a COPT subsidiary. “At the beginning of this project we priced all the competitors and found that MTU offered the lowest installed cost and shortest lead times.”

Unique data center design

Power Loft I @ Innovation uses a two-story design for its facilities, with the raised floor on the second story and the mechanical and air-handling equipment on the ground floor. According to Ruppe, this design maximizes the amount of floor space that can be dedicated to server rack space and improves the efficiency of the cooling system by 50% over conventional designs. “To put this in perspective, our facility in Manassas creates an annual environmental savings equivalent to 270,000 barrels of oil or 571 railroad cars of coal, which is enough electricity to power more than 12,000 homes for one year,” he says.

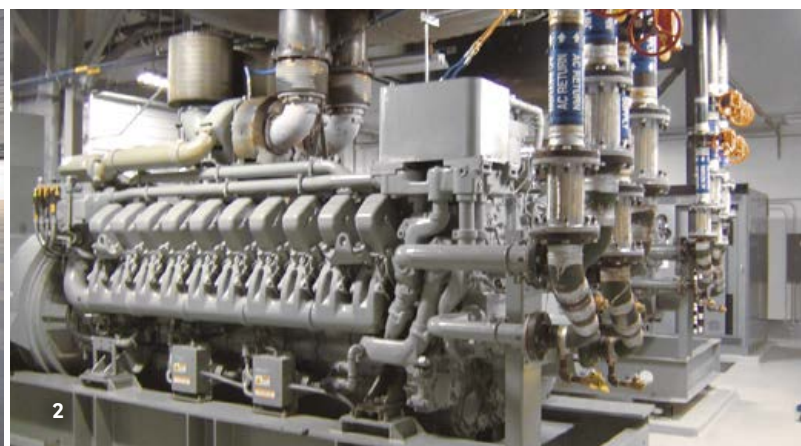
In the event of a utility outage, Power Loft I @ Innovation’s first line of defense is its UPS system—five HiTec rotary UPS units powered by MTU engines and several static UPS units totaling 9 MW of uninterruptible power for critical loads. The UPS system bridges the time it takes to start the MTU standby power system.

The standby generators installed in the first phase of the facility’s construction are located in a mechanical building adjacent to the data center. The installation features the use of remote radiators on the generator sets to realize several benefits. “By using remote radiators, we freed up more space in the mechanical building for switchgear and generators,” says Ruppe. “In addition, with the radiators outside the building, we were able to reduce the amount of outside air required for cooling. Lastly, the remote radiators allow the generator sets to start a little quicker because there is no mechanical load from the radiator fan.”

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- 1 Power Loft uses a two-story design with the raised floor on the second story and the mechanical and air-handling equipment on the ground floor to maximize server rack space and improve cooling efficiency.
 - 2 One of several 2,500 kW MTU generator sets that supply critical emergency standby power for Power Loft. More recent generator sets are located outdoors in sound-attenuated enclosures.



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Doing the right thing environmentally

As part of Power Loft I @ Innovation's green initiative, the standby diesel generators that were installed in the first phase were outfitted with selective catalytic reduction (SCR) exhaust aftertreatment equipment. This aftertreatment device significantly reduces the amount of nitrogen oxides in the diesel exhaust, resulting in emissions that are significantly lower than EPA requirements for standby power applications.

"The original standby generator sets were outfitted with SCR, and the most recent phase of standby power is set up to readily accept SCR," says Ruppe. "We did that because targeted Government and contractor tenants want to be green, and we want to do the right thing. We intend to eventually operate all of our standby units with SCR, so we've designed all of the generator sets to accept SCR and diesel particulate filter aftertreatment equipment."

"At the beginning of this project we priced all the competitors and found that Rolls-Royce offered the lowest installed cost and shortest lead times."

Dave Ruppe

Chief technical officer, Power Loft Services LLC

The four most recently installed generator sets are located outdoors in custom-designed enclosures, according to Bill Pearson, key accounts manager with Western Branch Diesel, the local MTU distributor. "These generators are set up so Power Loft can easily adapt them for SCR without having to modify the enclosures."

The outdoor enclosures are also sound-attenuated to 75 dBA and include day tanks, transformers and lighting for easier generator maintenance. Both the generator sets and the enclosures are certified to IBC seismic standards to withstand earthquakes. When a rare 5.2 earthquake hit Virginia in August of 2011, the Power Loft I @ Innovation facility was unaffected. According to Ruppe, "We didn't even lose utility power."

Power Loft I @ Innovation expects to add more and more servers as its customer base grows, and more servers mean the facility's standby power needs will grow too. In addition to the 24 MW of standby generation installed now, an additional 26 MW may be installed over the next few years, says Ruppe. And with the positive experience Power Loft has had with their current standby units, chances are that more MTU generator sets will be backing up this environmentally conscious data center.

Rolls-Royce provides world-class power solutions and complete lifecycle support under our product and solution brand MTU. Through digitalization and electrification, we strive to develop drive and power generation solutions that are even cleaner and smarter and thus provide answers to the challenges posed by the rapidly growing societal demands for energy and mobility. We deliver and service comprehensive, powerful and reliable systems, based on both gas and diesel engines, as well as electrified hybrid systems. These clean and technologically advanced solutions serve our customers in the marine and infrastructure sectors worldwide.

