

POWER PROFILE

Customer: Kansas City International Airport (KCI)

Location:
Kansas City, MO

Customer Business Issue:
Standby power for airfield

Solution:
3512B diesel generator sets (2),
4600V 1200 A utility/generator
paralleling switchgear
Three Year Customer Value Agreement

Cat® Dealer:
Foley Power Solutions



KCI's new terminal will support more efficient airline operations and allow airport users to enjoy the convenience of modern air travel in an updated facility.

At just over one million square feet, the Kansas City International Airport (KCI) Single Terminal is the largest infrastructure project in the city's history. The structure will be built on the footprint of the airport's former Terminal A, which was decommissioned and demolished in the summer of 2019.

Completion is estimated in 2023, with 39 gates and the ability to expand to 50 in the future. The project will also include a 6,300-space parking structure. The new terminal will support more efficient airline operations and allow airport users to enjoy the convenience of modern air travel in a facility with updated technology and amenities, close parking, spacious gate areas, and ample food and beverage options.

"Travelers will be impressed by the wide-open spaces the moment they enter the terminal," says an airport statement on the project. "Light and airy with a Kansas City feel, including our signature fountains, the KCI single terminal will be a different journey than before."

POWER NEED

While construction continues on the modern new airport terminal, behind the scenes a critical systems upgrade took place in December 2019.

As construction continued on the \$1.5 billion Single Airport Terminal, technicians from Cat® dealer Foley Power Solutions assisted specialists from Caterpillar in upgrading electrical switchgear that provides emergency backup power to the airport's runway lights. The runway must be illuminated at all times to provide navigational aid to pilots, while the chillers provide air conditioning to the passenger terminal.

The Cat Switchgear is an integral component of Kansas City International Airport's standby power system, and includes two Cat 3512B diesel generator sets that can parallel with the utility grid, or go it alone should grid power be lost.

"One of the most critical places here is the airfield," says Kenneth Williams, fleet asset manager for KCI. "Usually when we anticipate severe weather conditions we want the generators already running. That way, it's a matter of switching over to backup power so our airport controllers don't get a big glitch which could cause flight delays and safety issues. So, it's really critical for us to have those airfield lights on at all times."

The Cat gensets and switchgear at KCI were installed in 2004. While generator sets tend to stand the test of time, switchgear is technology that requires regular attention and periodic upgrades.

"People tend to think that switchgear never fails," says Steve Messina, a product support and service rep for Foley Power Solutions. "It's a big piece of equipment that sits in a room by itself. As long as the generators are running right and they're testing them right, they tend to think everything is fine and dandy."

With the advance of technology, the timeframe for upgrades has been cut in half to once every 10 to 15 years, he says.

"Ten years goes by in a hurry, and little do they know that some of those parts will become obsolete," Messina says. "With technology, there's always an update, and it's the same with switchgear. Protective relays and PLCs become obsolete over a period of time, and that timeframe is getting shorter and shorter."

"There's a lot of switchgear units out there that are over 20 years old," Messina adds. "A lot of places just stay with the same equipment because it has worked. Normally they don't react until there's an issue. We want to make sure people understand that this equipment is crucial to the operation of the generators coming on in case of a major emergency."

Without properly functioning switchgear, in many cases the generator sets will not start automatically and require a manual start.

Hospitals and data centers are prime candidates for switchgear modernization, says Steve Holland, advanced electrical services manager for Foley Power Solutions.

"If a data center's equipment goes down, it could cost millions of dollars a minute," Holland says. "And with a hospital it could result in the loss of life if their power backup system does not function properly."

SOLUTION

When KCI's standby power system began experiencing some age-related technical issues, the team at Foley Power Solutions conducted an assessment of the switchgear in 2018, and subsequently recommended a comprehensive upgrade after consulting with electrical engineers at the Cat Switchgear facility in Alpharetta, Ga.

"When we identify a potential upgrade, we bring the experts in from Caterpillar, and they provide us with a solution as to what it will take to get that component or system out of an obsolescent situation," Holland says.

"As with any technology, the PLCs and the relays and the HMI are left in the past," Holland adds. "When it's not serviceable anymore or the next generation comes out, those particular products begin to become obsolete. It's not only

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on the switchgear itself, but it's also the control panels of the generators.

"In conjunction with modernization of the switchgear, we're also working with the installation of new, upgraded control panels on the generators so that we can make these two items work in unison so that when those generators are called upon, they're ready to go."

The upgrade at KCI included the control panels on the generator sets (to EMCP4.2), as well as the PLCs, relays and HMI software on the switchgear.

Prior to the installation, Williams traveled to the Cat Switchgear facility for a factory witness test.

"We sat down, had a meeting and then we started doing our testing and they were really helpful," Williams says. "They saw what our needs were and how we wanted the units to be configured. We're running two engines side by side, separate but together, and the way they helped program that was amazing."

Prior to the actual installation in Kansas City, dry runs were rehearsed back at the Cat Switchgear facility in Georgia. The Cat Switchgear team conducts dry runs to ensure that everything is correct when it arrives at its final destination.

"It's as close to plug and play as you can get," says Cliff Puttoff, a master technician from Foley Power Solutions who assisted on the project. "We did everything in stages to ensure that the airport was never down at any time. They always had one engine ready to go. We staged the process with Cat Switchgear and did everything in little steps to get there."

Two engineers and an installation technician from Cat SwitchGear started with the simplest components and worked their way up. Puttoff and another Foley technician upgraded the control panels on the gensets, and also assisted on the switchgear upgrade.

"They drop one side of the gear down, rebuild it back up, and then they'll move over to the next side once it's proved out," Puttoff says. "At the end of the test when all the gear is done, we run through every possible scenario that we can, including loss of utility power, bringing utility power back, as well as other scenarios. We do everything to make sure there are no surprises in the end."

The final step involves familiarizing staff with operation of the switchgear, from simple startup to checking alarms. "We go through everything we can until the customer is comfortable," Puttoff says.

RESULTS

The new switchgear includes an HMI software upgrade and enhanced graphics, which is more intuitive and easy to operate.

"A lot of our guys that work with those generators like the new software," Williams says. "They like to see all the different graphics on the screen, and it's really helped them understand the various functions and how to operate it."

Foley Power Solutions can also add enhancements such as remote HMIs, which provides the ability to view the status of the equipment from anywhere in real time, thereby reducing risk.

As a PSSR, Messina's role involves talking to Williams on a regular basis to make sure the Cat dealer stays on top of service and maintenance. As part of a three-year Customer Value Agreement with KCI, Foley technicians perform oil changes at scheduled intervals, take fluid samples, and perform annual preventive maintenance on the Cat Switchgear as well.

Customer Value Agreements (CVAs) feature individualized solutions for parts and service, all of which are designed to address the evolving needs and expectations throughout an asset's lifecycle. With CVAs, the focus is on delivering a customized outcome, such as hassle-free maintenance or engine protection.

"We have everything set up for routine maintenance, which has really worked out well for us," Williams says. "They take quite a bit of the pressure off us, especially with the generator. It's been a good relationship. It's an easy call and they always respond quickly. The Foley guys know our equipment, and that makes it so much easier."

The KCI switchgear modernization brings all components up to date and ensures the standby power system is operating correctly 24 hours a day, 7 days a week.

"It's just peace of mind for the customer," Messina says. "He knows it works because we thoroughly tested it, and it's been working great with no problems. And that's money back in his pocket. We're not out here every month trying to update something or fix a problem. We put in all brand-new stuff and it's going to be even more reliable going forward."



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