

RUNREADY™

SPOT ON

Mobile power key to Hurricane Michael disaster relief effort

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Louisiana



STANDBY POWER

NATURAL GAS GENERATOR SETS FOR STANDBY APPLICATIONS

The market for large-scale standby electric power has taken a purposeful turn toward natural gas gensets. Gas engine development has quickly and successfully responded to the market's need for low-emission engines capable of the fast load acceptance that standby service requires. Many facility operators now welcome natural gas generator sets as a way to meet the growing list of challenges in standby power service.

For decades, diesel engine generators have dominated the standby market, while natural gas engine-generators were seldom considered. However, gas-fueled generation has been widely accepted for some time in electric power applications such as load management and combined heat and power (CHP).

Today, with vast improvements in gas engines' ability to meet code-driven start time and load acceptance standards, there are applications where gas engines have advantages over diesel engines. In fact, there are applications in which emission rules and fuel security concerns make gas engines the preferred choice.

The latest gas engines designed specifically for standby duty can be ready to accept load in time spans comparable to diesels. The reconfiguration of gas engines specifically for standby duty has brought natural gas generator sets squarely into the mainstream for industrial and commercial facilities.

Trends driving change

Traditionally, standby power has been a diesel market because diesel engine characteristics have inherently fit. Diesel engines, with their high power density, offered low first cost and the capability to assume loads quickly during emergency startups. Operating cost was largely irrelevant because standby generator sets typically operate for less than 100 hours

per year, and often only for periodic exercising. Additionally, emission requirements were easy to meet and not a major concern.

Meanwhile, gas engines, with lower power densities and higher initial costs than diesel engines, were designed for extended duty. In this application, fuel cost, maintenance cost and emissions were (and remain) the key concerns.

The longer the operating hours and the greater the number of years in the evaluation period, the greater the fuel cost advantage of gas technology.

However, recent events have exposed some limiting factors of diesel engines in certain applications. For example, after major storms such as Hurricane Katrina on the Gulf Coast and Superstorm Sandy on the upper East Coast, diesel generator sets at certain sites did not operate throughout the duration of the power outage. Some fuel storage tanks were compromised by flooding. In other cases, flooding or debris blocked streets and highways so that fuel trucks could not make deliveries, leading to fuel tanks running dry. Meanwhile, natural gas pipeline networks were minimally affected, if at all.

More broadly, diesel standby generator sets have been limited by emissions regulations, notably in regions where air quality is not in compliance with U.S. Environmental Protection Agency (EPA) standards. In most localities, emissions from Tier 2 diesel standby engines are acceptable as long as they operate for 100

annual hours or less (excluding hours in actual emergency duty).

Facilities with large standby diesel capacity may exceed the site emission limit and face significant fines, just for emissions from routine exercising. Even an upgrade to Tier 4 diesel technology, at much higher cost, may not provide a complete remedy. In such cases, the advantage of natural gas-fueled

standby power is clear—today's high-efficiency, lean burn engines can operate for an extended time in full emissions compliance while meeting rigorous requirements for start time and load acceptance.

Gas: The cheaper alternative

The choice of gas versus diesel standby power also depends on a comparison of initial cost. Diesels at a Tier 2 level, where permissible under emissions rules, retain a first-cost advantage over gas generator sets. But for sites that require Tier 4 diesel technology, the first-cost advantage quickly disappears. In applications with first-cost parity, gas standby engines have a long-term cost advantage by way of lower operating costs.

For example, while diesels generally require oil changes every 250-300 operating hours, depending upon the load factor, gas engines have oil change intervals of 1,000 hours, and in some

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models, much longer. That becomes significant after major natural disasters, when standby equipment may operate for a week, two weeks or longer before utility power can be restored. Even during a standby power event, maintenance on generating equipment is still required at or near recommended intervals in order to maintain the system's operational integrity.


Fuel costs can also be significant, and not exclusively in times of extended standby duty. For example, consider a 1 MW diesel engine and a 1 MW gas engine operating for 100 hours during a year, with diesel fuel at \$2.50 a gallon and natural gas at \$4/MM Btu. For those 100 hours of operation, the gas engine's fuel would cost about \$20,000 less than that of the diesel. The longer the operating hours

and the greater the number of years in the evaluation period, the greater the cost advantage of gas technology.

In addition, there is the initial and long-term cost of onsite fuel storage. Diesel fuel is typically paid for when delivered to the site and stored. Depending on the fuel volume, that can be a significant investment. In addition to the initial cost, the fuel needs to be maintained while in storage. This includes fuel polishing when needed, fuel storage additives, and tank and site maintenance and control. Natural gas, on the other hand, is purchased as used and does not require additional cleaning beyond the always-recommended in-line fuel filter.

When choosing natural gas or diesel standby power for a given application, consulting with a dealer or representative

of an engine manufacturer with a proven track record in the standby market is helpful. These professionals have access to engine generators in a broad range of power ratings and configurations and are experienced in both diesel and gas technologies.

Cat® dealers can manage whole-project engineering, procurement and construction, and supply all engines, generators, transformers, switchgear and other required ancillaries. They also have access to manufacturers' financing programs to help tailor the project in a budget and cash-flow friendly manner. 

To determine if a gas standby generator set is the right choice for your facility, contact the power systems experts at our dealership.

DAMAGE CONTROL

CAT® RENTAL POWER DELIVERS CRITICAL HELP TO HURRICANE MICHAEL RECOVERY EFFORTS

When it made landfall in the Florida Panhandle on Oct. 10, Hurricane Michael was the fourth-strongest hurricane on record to hit the contiguous United States, attaining peak winds of 155 mph. The fast-moving Category 4 storm ranks as the third-most intense Atlantic hurricane to make landfall in the U.S. based on barometric pressure. >>

Mexico Beach, Fla.



By October 28, at least 60 deaths had been attributed to the storm, including 45 in the United States and 15 in Central America. Hurricane Michael caused at least \$11.28 billion in damages, including \$6 billion in destroyed U.S. fighter jets at Tyndall Air Force Base, and at least \$1.5 billion in insurance claims in the U.S. Losses to agriculture and timber alone exceeded \$3.68 billion.

Along the Florida Panhandle, Mexico Beach and Panama City suffered the worst of Michael, with catastrophic damage reported due to the extreme winds and storm surge. Numerous homes were flattened and entire stands of trees felled over a wide swath of the panhandle. As Michael tracked across the southeastern U.S., strong winds caused extensive power outages across the western Florida Panhandle before it tracked northeast into southern Georgia.

“This was like one large tornado, it came in fast and furious and it moved through at the same speed, so there was total destruction from wind damage,” said Larry Harrington, whose company, Trans4Fed, provides spot power generation as part of disaster relief. “In the wake of the storm, houses, roads, and critical infrastructure were gone, and it’s not like we can come in and pin up power poles. They were snapped off and all the major transmission lines were gone—roofs and houses collapsed. It’s like one big, tremendous tornado came through.”

The number of Category 4 and 5 hurricanes in the North Atlantic have increased since the 1980s, according to the National Environmental Education Foundation. Six weeks before Michael, Hurricane Florence brought catastrophic

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rainfall and flash floods to the Carolinas. According to the National Oceanic and Atmospheric Association (NOAA), 2018 has exceeded what was expected to be a year of below-normal hurricane activity.

As the world's oceans continue to warm at a fast rate, it means hurricanes are more likely, climate scientists predict. Long-term trends indicate a worsening of the length and intensity of Atlantic storms.

In 2017, there were 40 separate cases of rapid intensification, the most in at least 35 years. A troubling pattern is the

more self-sufficient, and that also applies to institutions and all the facilities and infrastructure that's out there. We're seeing a lot of money spent this year alone in developing greater resiliency."

Because transmission lines are knocked out during major storms, the ability to deliver mobile power generation both before and after a storm is key to recovering from the devastating effects of a storm.

Trans4Fed specializes in emergency/disaster response services, providing

Herrington says he relies on Cat generators to provide spot generation in the wake of disasters due to their reliability, and the dependable nature of the Cat Rental Power network. The network offers diesel and gas-powered generator sets from 20 to 2,000 kW, and possesses a substantial inventory to meet any customer need. The ability of the Cat dealer network to deliver rental power when and where it's needed in timely fashion has been demonstrated repeatedly over the last three hurricane seasons.



"Many of our customers are some of the larger remediation companies that run the big driers and the big dehumidifiers, and these processes require a lot of power—it's one of the first steps in the recovery process, and you have to have spot generation to make it work."

LARRY HARRINGTON, CEO, Trans4Fed

increase in storms that transform from a Category 1 hurricane to a Category 5 monster in less than 24 hours. In the case of Hurricane Maria, this left people on the island of Dominica with insufficient time to prepare. Rapid intensification was part of the reason why damage from Maria cost an estimated \$90 billion. With more people and more infrastructure located in vulnerable areas, Maria is joined by Harvey and Irma among the five costliest hurricanes on record to hit the U.S.

Developing resiliency

As hurricanes and tropical storms continue to batter coastal and contiguous inland regions, having the ability to prepare and adapt to changing conditions and withstand and recover rapidly from major weather events has become more important than ever.

"We need to become more resilient and learn how to survive 24 hours after a major event and not have the attitude that somebody's going to arrive and help us out," says Herrington, a retired two-star U.S. Army general with 30 years' experience in coordinating disaster relief. "We need to become

onsite power generation to businesses and individuals. The Purvis, Miss. company partners with Cat® dealer Thompson Tractor Co. to deliver rental power wherever it's needed.

"Our function is to get a facility back up in operation, so there's a lot of communication that needs to take place," says Herrington, who served as task force commander in Mississippi during Hurricane Katrina in 2005. "There is a network that has to be formed before the storm, and during the disaster event. And it requires a lot of teamwork and a lot of 'want to.'"

In order to withstand a storm and recover from it quickly, providing energy is a primary step that facilitates a lot of other things in the recovery process, Herrington says, citing a report that more than 4,000 electrical service contractors massed to restore power in the wake of Hurricane Michael.

"Many of our customers are some of the larger remediation companies that run the big driers and the big dehumidifiers, and these processes require a lot of power—it's one of the first steps in the recovery process, and you have to have spot generation to make it work."



“Cat gensets have a reputation for reliability, and Thompson Power Systems is able to provide an adequate quantity of generators at the different sizes that we need to support our customers,” Harrington says. “I don’t think there’s too many of them that can do that. It’s about being prepared early on, not being caught flat-footed, and our Thompson representative does a great job understanding our needs and supporting us.

“You didn’t see that a decade ago,” Harrington continues. “This type of equipment was very scarce—it was very

limited and relegated to governmental entities or institutions like hospitals. “Now we’re able to provide the power and have many small grids going into houses and communities to get businesses back on line. The economic effect of an event like this is horrific, but deploying mobile units enables us to get restaurants and the big box stores back up and communities on the road to recovery.”

Power to the people

At the East Calloway substation just northeast of the devastated coastal

community of Panama City, Power South Energy Cooperative utilized a Cat XQ2000 generator set to provide power to a large segment of the population. With transmission lines down, Power South bypassed the transmission station and ran with generator power, said Lanie Sells, a substation operations and maintenance engineer.

“With the help of the Cat generators from Thompson Power Systems, we restored power to all of our substations,” Sells said. “After the hurricane, we found out what they could supply us with, and the next day they were getting them here and hooked up. So it was very quick—it all moved very fast.

From delivery to connection, 24/7 monitoring and coordinated refueling, Thompson Tractor provided the utility with turnkey service.

“Once the Thompson technicians got here, they took care of everything, and

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Port St. Joe, Fla.



Panama City, Fla.



“Even if we’ve never done business with them before, if they’re a new customer and they have a need, if we can support that need and we can provide mobile power units, we’re going get it done for them.”

McCALL BERGMAN,
Rental Power Representative
Thompson Power Systems

we had no worries about the generators staying on and providing continuous power,” Sells said.

Preserving inventory

Located 12 miles south of Mexico Beach, Raffield Fisheries Inc. in the coastal community of Port St. Joe incorporates all aspects of seafood production. Fish are preserved in a massive, state-of-the-art freezer unit that holds 10 million pounds of seafood. From there, various seafood products are shipped to many domestic markets and to a varied group of international markets, including developing nations, Canada, Caribbean countries, Europe and Asia.

While Raffield Fisheries had an existing backup generator set to keep its freezer running, saltwater spray was driven by the storm’s high winds into the windings of the generator, causing it to short out. Owner Eugene Raffield, Jr. placed an urgent call to Thompson Power Systems, which promptly furnished the business with a Cat 1,000 kW mobile generator.

“It ran beautiful; it was so well orchestrated,” Raffield said. “It came here on time. It was ready to go. It was very simple; it got us back up and running. We got our freezer back going and made ice.

“But this wasn’t a case of just saving Raffield Fisheries with a Cat genset—it did a lot more than that,” he said. “Because we had 300,000 pounds of ice-making capabilities, we were able to make ice and give it away to people in need who didn’t have any ice throughout the region of Bay County.

“When you get that kind of service, that’s important in a critical time because if that freezer goes down, we have a bigger problem,” Raffield said. “I had \$4 million dollars of product in there, so we saved all of that.”

Right next door, Ed Wood of Wood’s Fisheries, Inc., found himself in a similar predicament. The facility had 700,000 pounds of farm-raised and Gulf shrimp that needed to be refrigerated within 48 hours, or it would be ruined. Because roads were not open to truck out the inventory, the only solution was to import mobile power as soon as possible.



“With the help of the Cat® generators from Thompson Power Systems we restored power to all of our substations.”

LANIE SELLS

Substation Operations & Maintenance Engineer
Power South Energy Cooperative



After one full day of making phone calls to find a generator, Wood finally landed on McCall Bergman, a rental power rep for Thompson Power Systems.

“There was no paperwork or other delays,” Wood recalls. “The generator was delivered onsite within 24 hours, and we had techs on the phone helping us connect it before any of that was even talked about.”


Bergman says the mission of Thompson Power Systems and the Cat Rental Power network is to do whatever is necessary to support customers, especially during times of critical need.

“Even if we’ve never done business with them before, if they’re a new customer and they have a need, if we can support that need and we can provide mobile power units, we’re going to get it done for them,” Bergman says. “So, a lot of times there’s no questions asked. It’s just ‘hey, let’s get it done.’ These folks need a generator. Let’s get it out there to them as quickly as possible.”

Bergman coordinated fuel delivery so the generator could run continuously. Having power enabled Wood’s Fisheries to make ice and 50,000 gallons of potable water daily, which was made available to the community for free.

The generator may have done more than preserve \$5 million worth of product. Wood says it may well have preserved customer relationships. His business provides farm-raised and wild-caught shrimp to national grocery store retailers.

“Some people may say just let the product go, because it’s the same insurance deductible either way,” Wood said. “But the biggest thing for us would be product interruption for our customers. That could prove far more costly than what the dollar value was in our freezer, because we could lose our customers.

“For us, having the Cat rental generator was the best form of insurance.” 



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CONCEPT TO COMMISSIONING

Louisiana Cat has an extensive range of generator options, for standby, prime and continuous power, industrial, pump and co-generation applications. We offer switch gear, power storage, monitoring and customized packaging solutions to meet any need.

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GOING TO THE NEXT LEVEL

Louisiana Cat installs microgrid at its New Iberia facility



With energy microgrids emerging as next level technology in distributed power generation, Louisiana Cat has installed its own microgrid at its Energy and Transportation Headquarters in New Iberia, La.

“Through the development, investment and operations of the various components of a microgrid, we can better understand the technology and how to apply it in a commercial application,” says Mike Jennings, general manager of Louisiana Cat’s Energy and Transportation Division. “This type of commitment will help us better serve our customers moving forward.”

The solar array consists of 1550 Caterpillar PVT115 thin film photovoltaic (PV) panels with a nameplate rating of 178kWp. The Cat solar panels are mounted on the

roof of the high service bay area of the facility, and in turn feed five 30 kW SMA string inverters. The string inverters change the direct current (DC) produced by the PV panels to alternating current (AC), providing for a maximum output of 150 kW AC on a cloudless sunny day. The PV array is connected to the grid, and sells power back to the utility when the facility’s electrical load is less than the power from the PV array generated.

Being in close proximity of the Gulf Coast, hurricanes are always a consideration in building design, Jennings says. Acting as the general contractor for the project, Louisiana Cat worked closely with its chosen installation partners, EP Breaux and South Coast Solar, to ensure the roof design would not only accommodate the added weight of the PV array and system components, but also incorporated panel clamps approved

by the building’s roof manufacturer to withstand 140 MPH wind loads.

To accommodate the PV array, several modifications to the utilities service entrance were required. The Cat dealer took advantage of the project’s required electrical modifications and installed a Cat® CG137, 400 kW natural gas generator set, along with a Cat® service entrance-rated automatic transfer switch (ATS) for the facility’s standby power.

Since the PV array began operating on March 22, it has saved \$7,254 in two and one-half months, producing just over 75 megawatt hours of energy. That translates into a net carbon reduction of 57 tons, Jennings says.

“So, you can see the benefit from green technology almost immediately,” he added.

Cat® Microgrid Master Controller integrates energy sources

As the microgrid project evolves, the next step will be to add energy storage along with a Cat Microgrid Master Controller (MMC), Jennings says. The Cat MMC is designed for large industrial/campus installations and used to integrate a variety of traditional and renewable energy sources providing overall monitoring and control of the different assets.





Energy and Transportation Headquarters, New Iberia

By incorporating a MMC, the complete system can then be monitored remotely using Cat Connect Technology to provide real-time performance monitoring and overall health of the installation. If an issue is detected, local technicians can be dispatched to resolve the problem.

“Control and monitoring is really the secret sauce for a dependable and energy efficient microgrid,” Jennings adds. “Caterpillar has done a fantastic

job of coming together with a control strategy in their microgrid controller to manage all of the different energy assets.”

Market potential

Microgrids that combine renewable energy with diesel or gas generator sets and energy storage capabilities can deliver clean, cost-effective electricity to remote locations with limited or no access to reliable utility power.

The Cat Hybrid Microgrid Solution provides:

- Increased energy efficiency with no reliance on the grid and optimal total cost of ownership.
- Efficient power that can be produced where and when it is needed without transmission lines and transformer losses.

continued on next page



“We are more or less **WALKING THE TALK by installing and **OPERATING OUR OWN MICROGRID.**”**

MIKE JENNINGS

General Manager, Louisiana Cat Energy and Transportation Division

- High performance, scalable system designed and built using standardized building blocks that are easy and quick to install even in challenging environments.

Cost-effective electric power has been a challenge for communities and industrial or commercial installations without access to a strong utility grid. They have had to rely on engine- or turbine-driven generator sets that, while highly reliable, typically produce power at a much higher cost than a large utility.

Aided by sharp declines in the cost of wind and solar energy, as well as lower energy storage costs relative to the price of fuel, hybrid microgrids are well suited to a host of applications, including individual buildings, resorts, mine sites, remote villages, small islands and others. The most promising applications are those with total power demand from 100 kW to 20 MW.

“Caterpillar saw the need to move into this space,” Jennings says. “The integration and addition of energy storage and PV components are a perfect complement to the large array of power products already in Cat’s portfolio.

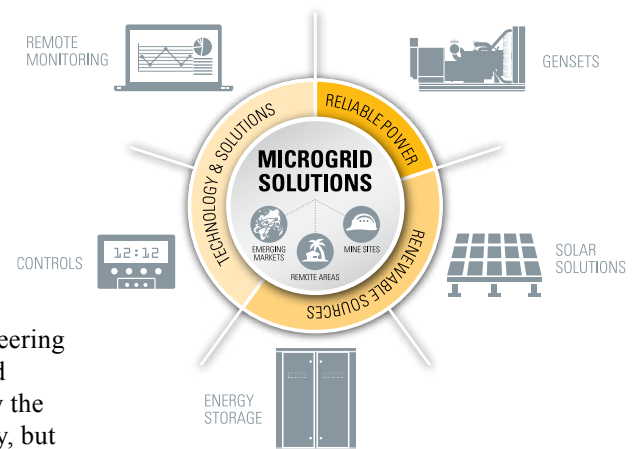
“Opportunities are not just in North America, where we have a very stable and dependable utility grid, but are even more promising in developing countries where their primary source of electric power is diesel-fueled generator sets,” Jennings says. “Solar and energy storage costs continue to decrease, so it’s really starting to make economic sense for customers to move into the renewable energy space and harness the power of the sun to displace some, if not all of the high cost associated with fossil fuels.

“When you’re in a country where the cost of diesel fuel is upwards of \$5.00 and \$6.00 a gallon, and in a very remote location running a diesel generator set for power, replacing that diesel fuel with a green technology starts to make

tremendous fiscal sense,” he adds.

As Louisiana Cat cultivates potential new markets both domestically and internationally with its EPC partners, the dealer will continue to gain more knowledge and insight as it builds out its own microgrid. Beyond the engineering aspects, the dealer has gained valuable insight into not only the application of this technology, but also the permitting process, as well as realizing federal incentives for renewable energy.

“We really wanted to understand all of what was involved before we go out and talk to our customers about it,” Jennings says. “So that’s what this has done for us—it has helped us better understand the engineering and application aspects of a project



like this—things that you need to be very cognizant of to ensure long term success.

“Our goal is to have a fully functional microgrid here at our New Iberia facility so it can serve as a working model to our potential customers and future clients.”



30 kW string converters



MISSION OF SERVICE

MEDICAL SCHOOL MODEL ADDRESSES PHYSICIAN SHORTAGE IN RURAL AREAS

In 2011, the former president of Auburn University visited each Alabama county and saw the extreme need for rural physicians that provide primary care. Officials at Auburn University (AU) recognized abysmal health outcomes in

Alabama and the extreme shortage of physicians—then ranking 46th in the country for number of physicians per 100,000 population.

The situation in Alabama mirrors a national trend. A study in 2002 reported in *Health Affairs* estimated a shortage of 50,000 physicians in 2010 and more than 100,000 physicians by 2020.

The conclusion reached by former Auburn president Dr. Jay Gouge and AU administration was that establishing an osteopathic medical college would best fill this need.

In the meantime, a model for establishing a non-profit medical school to address the shortage of rural physicians was already well established on the campus of Virginia Tech. The Edward Via College of Osteopathic Medicine (VCOM) opened its doors in the Virginia Tech Corporate Research

Center to the first students in fall 2003 and graduated its first class in 2007.

VCOM's founding vision was to provide healthcare for the underserved regions of Southwest Virginia, Western North Carolina, and the Appalachian Region, and to promote biomedical research with Virginia Tech.

In response to the enrollment of a significant number of students from western North Carolina and South Carolina, VCOM opened a second Carolinas campus in Spartanburg, South Carolina in 2011. Recognizing the success of VCOM and Virginia Tech collaboration, AU representatives visited both the VCOM Virginia and Carolinas campuses prior to opening VCOM-Auburn as a fully accredited branch campus in 2015.

CUSTOMER PROFILE

Edward Via College of Osteopathic Medicine

Location: Auburn, Ala.

Application: Standby power

Cat® Equipment: G3412 gas generator set



Continued on page 10

In a state-of-the-art building on the southern end of the Auburn University campus, more than 325 VCOM first- and second-year students are taught the fundamentals of osteopathic medicine—which incorporates basic science, anatomy, physiology and biochemistry. During their third and fourth years, the medical students are assigned to clinical rotations at hospital sites that serve rural areas.

“We have a history of recruiting students from rural areas,” says Dr. Elizabeth Palmarozzi, dean of VCOM-Auburn. “We try to educate them not only here on campus, but we arrange for them to work in rural areas for their clinical experiences, and that encourages them to want to go back to a rural area when they graduate.”

The approach works, as approximately 67 percent of graduates go on to practice in underserved areas.

“When I first interviewed back in 2003, VCOM-Virginia hadn’t been built,” adds Dr. Jeremy White, an associate dean at VCOM-Auburn who was part of the school’s first graduating class in 2007. “I took a chance on a school that hadn’t even been built yet, and 15 years later, I can attest to the founding promise that we offer a unique experience in medical education.”

Critical power need

Continuous, uninterrupted power is a critical element that supports virtually everything that takes place within the walls of the four-story, 100,000-square-foot building.

VCOM’s curriculum is based on a digital platform. Lectures are given on PowerPoint presentations and recorded so students can access them if they’ve missed class or need to refer back. Exams are also administered digitally.

“These students have so much information thrown at them over four years that anytime they can retrieve the data that they need, the faster and better for them when they’re cramming and studying,” says Shayfer Mosness, director of information technology at VCOM-Auburn.

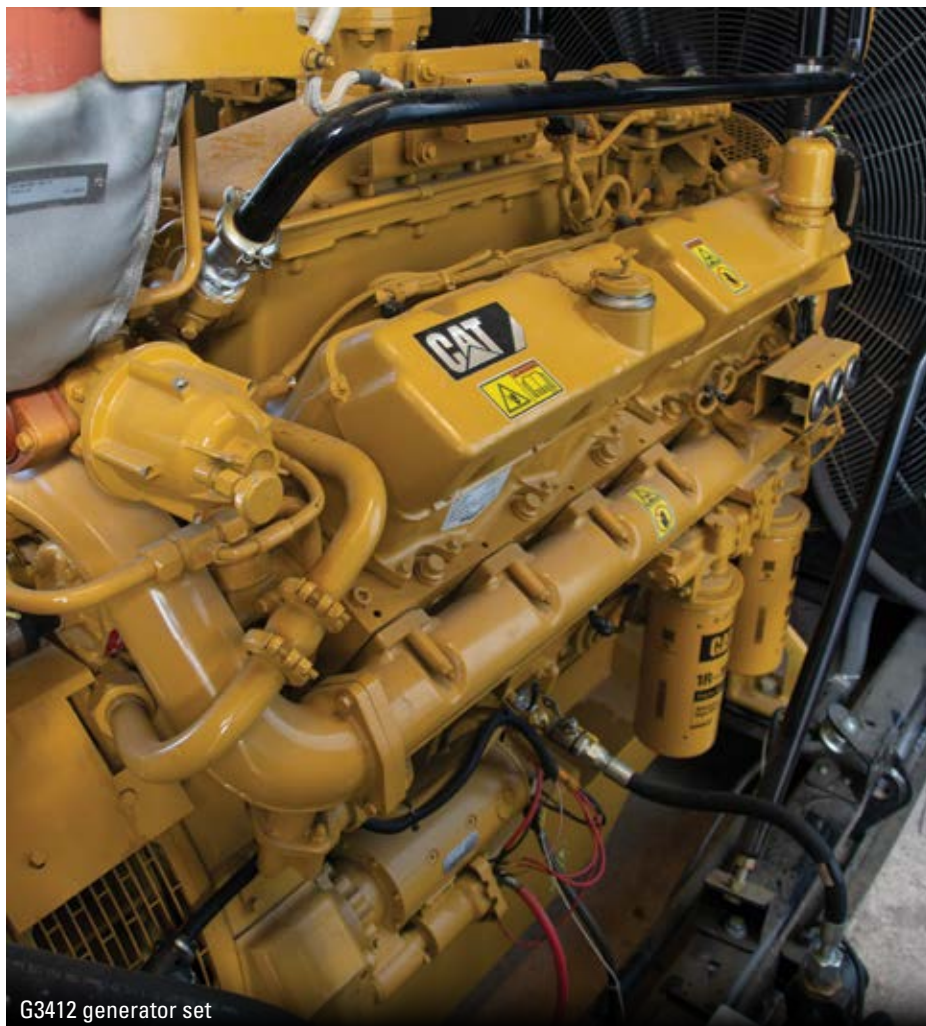
“Keeping the power on is also critical for the HVAC systems, because my audio-visual and data rooms need to stay cool,” Mosness adds. “Here in Auburn, Alabama, it gets hot quickly, so we need to keep those HVAC units running.”

A Simulation Center provides state-of-the-art technology for students to practice while honing their diagnostic skills. The VCOM-Auburn building also features a large osteopathic manipulative medicine lab with electrically adjustable tables, and a first-class anatomy lab.

Maintaining the anatomy lab at the proper temperature and humidity levels is essential for preserving the cadavers so the students can practice on them, says Randy Cerovsky, facilities director for VCOM-Auburn.

Aside from HVAC requirements, the Simulation Center is the most power-intensive department in the building. Activities include standardized patient encounters where students interact with patient actors (the mock clinical sessions are recorded), then return during their rotations and have simulated patient encounters. Procedural skills training involves tasks such as IV placement, tracheal intubations, and suturing. High-fidelity mannequins simulate various patient presentations and critical patient encounters.

“We need uninterrupted power, especially because we are very testing intensive,” White says. “We are evaluating 160 students at a time in a meticulous environment, and if there is any disruption in our testing environment, it can invalidate our testing scenario and

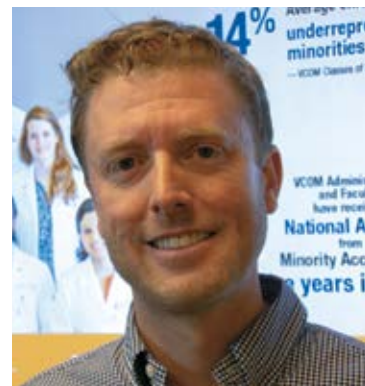


G3412 generator set

“One of the features I like best about our Cat® generator is the Cat Connect interface that enables us to receive SMTP notifications. So if there’s anything wrong with our generator—whether it’s starting, running, stop, default, or low fluids—we get notifications and then we can reach out to our sales rep and receive service immediately.”

SHAYFER MOSNESS

Director of Information Technologies
VCOM-Auburn



compromise what we’re trying to achieve here. So uninterrupted power is critical to what we’re doing for all three of our offerings in the simulation department.”

Backed by Cat® gas power

To ensure the power is always on, VCOM installed a Cat® G3412 gas generator to back up the utility feed at the Auburn campus when the building first opened.

The consulting engineer on the project recommended a gas generator because gas service was already available for some labs in the building.

“The theory was to avoid any disruptions from service trucks having to come here and fill diesel tanks with fuel, as well as potential problems maintaining the quality of the diesel fuel,” Cerovsky says.

Outside of several brief outages, the Cat generator set has seen extended run time once for an outage of about five

hours when AU cut off power during construction of a nearby nursing school. Every Friday, the generator automatically runs for 15 minutes to ensure the system is in proper working order. Based on a recommendation from Cat dealer Thompson Tractor, VCOM transfers the electrical load to the facility once a month.


“Every time the generator has kicked right in and done what it’s supposed to do,” Cerovsky says. “We have never noticed any delay in the amount of time it takes for the generator to start up and transfer the power over. Everything just runs smoothly. We’ve never had any issues.”

Cerovsky and Mosness receive email alerts whenever the generator set runs, and also notifications if any issues arise. This is helpful when the generator starts and runs for something other than a routine test, Cerovsky says.

“One of the features I like best about our Cat generator is the Cat Connect interface that enables us to receive SMTP notifications,” Mosness says. “So if there’s anything wrong with our generator—whether it’s starting, running, stop, default, or low fluids—we get notifications and then we can reach out to our sales rep and receive service immediately.”

Technicians from Thompson Power Systems perform regular maintenance on the generator sets.

“Thompson Power Systems has been great to work with,” Cerovsky says. “When we call them, if they can’t get here that day, we get a prompt response the next day. They do all of the service, and they explain everything. Not using the system every day, we sometimes forget some operating details that you need to know about.

“And Thompson is always very helpful and willing to do whatever it takes.” 



SOLAR SOLUTION

**TWO ILLINOIS PROJECTS
FEATURE HIGH EFFICIENCY
CAT® THIN-FILM SOLAR PANELS**

A 500 kW solar photovoltaic (PV) utility-scale demonstration project in St. Charles, Ill. was installed earlier this year as part of a 20-year power purchase agreement with the Illinois Municipal Electric Agency (IMEA).

Featuring more than 4,800 Cat solar panels that are expected to produce 500 kW of electricity, the 2.3-acre facility is located in the Legacy Business Center adjacent to the East Side Sports Complex in the western suburb of Chicago.

Caterpillar supplied the thin-film solar panels, inverters, controllers, and monitoring systems, while Cat dealer Altorfer Power Systems was responsible for installation, maintenance, and operation.

“We are very excited about this development and the prospect of deploying this environmentally responsible power generation facility,” said Tom Bruhl, Electric Services Manager for the City of St. Charles. “It’s a real signature project for our utility, the City of St. Charles, and IMEA.”

1 MW solar PV facility in Rantoul, Ill.



The Illinois Municipal Electric Agency is a not-for-profit unit of local government created in 1984 that is comprised of 32 municipal electric systems from all across Illinois. Each of those communities owns and operates its own electric distribution system, and some operate local power generation plants.

The IMEA's focus is the reliable delivery of bulk power and energy to its members at low and stable prices. IMEA combines the power needs of all of its members and secures the electricity necessary to satisfy those needs. The agency sells its members all their

wholesale power needs under long-term power supply contracts. To accomplish this goal, IMEA has assembled a portfolio of power supply ownership and long-term purchase power agreements.

Second project in Illinois

St. Charles represents the second agreement between Altorfer and IMEA that utilizes solar PV power to help diversify the authority's power generation capabilities. Last year, Altorfer Power Systems commissioned a 1 MW solar PV facility in Rantoul, Ill., which produces 1.65 million kilowatt-hours of electricity per year.

Constructed on the former Chanute Air Force Base in Rantoul, Altorfer sells the facility's electric output to the IMEA under a 20-year power purchase agreement, thus ensuring a carbon-free power source for the benefit of all IMEA-member cities. IMEA has the option of purchasing the facility after six years of operation.

Continued on page 14

CUSTOMER PROFILE

Illinois Municipal Electric Agency

Location: St. Charles and Rantoul, Ill.

Application: Solar power

Cat® Equipment: Thin-film solar voltaic panels



The facility is located on an eight and a half-acre site near Heritage Lake Park and the University of Illinois Transportation Lab in the southeast area of the former Chanute Air Force Base, and features a solar photovoltaic (PV) system powered by advanced thin-film solar modules that are setting the industry benchmark with improved performance over conventional silicon solar panels.

The Rantoul solar field system that produces the estimated 1.65-million kilowatt hours of electricity per year is enough to power about 145 homes, which is about two percent of Rantoul's need.

"You would need about 40 of these to match our summer peak load," Rantoul Public Works Director Greg Hazel told the *Rantoul Press*.

Rantoul's role is primarily to serve as a host site on an underutilized area of the former base, Hazel said. Other than providing the land for the demonstration site, the village's role has been to extend an electric distribution line about 700 feet to the solar field.

The project is a learning process for everyone involved — "Not only of the technical operation, but also the collaborative nature of the agreements and the success of the contractors in developing these sites," said Hazel.

Future expansion of the solar field is a possibility.

"We're just blessed to have the available space at the time of need," Hazel said. "We're excited to get this type of renewable (facility) in our community and serve as the host site for it."

High-performing PV panels and decreasing capital costs are making solar power an increasingly affordable and attractive option for forward-looking municipalities that are seeking to diversify their portfolios with clean, sustainable sources of power, said Tom Schmit, sales manager for Altorfer Power Systems.

"IMEA and the City of St. Charles have clearly demonstrated their leadership and foresight as pioneers in municipal power generation through their growing support of solar technologies."



Cat Microgrid technology

The Cat Microgrid suite is an innovative lineup of power systems that add environmentally friendly solar panels, state-of-the-art energy conversion and storage technologies, and advanced monitoring and control systems to Caterpillar's traditional line of reliable power generation equipment, which includes heavy fuel oil, natural gas and diesel generator sets, switchgear and automatic transfer switches.

The Cat Microgrid technology suite is designed to reduce fuel expenses, lower utility bills, decrease emissions, and reduce the total cost of ownership, while increasing energy efficiency in even the most challenging environments.


The Cat Master Microgrid Controller (MMC) keeps loads continuously energized with high-quality power at the lowest cost. It manages the flow of power from every source in the system, including the main grid when connected. The Cat MMC determines optimum recharge times for the energy storage systems while managing power during times when solar energy is not available.

Cat Connect Remote Asset Monitoring offers real-time collection and remote monitoring of site performance data in Cat Microgrid applications. Providing data, visualization, reporting, and alerts

from anywhere in the world through an easy-to-use web interface, this technology helps operators and Cat dealers track and manage the operation of the system, confirm desired cost savings, flag potential problems, perform remote troubleshooting, offer long-term archives of site performance history, and identify opportunities for further operational or system enhancement.

The Cat Bi-Directional Power (BDP) converter uses a world-class insulated gate bipolar transistor (IGBT) to seamlessly control the charge and discharge of energy storage options, which can range from traditional lead-acid batteries to lithium-ion applications and ultracapacitors.

The facilities in St. Charles and Rantoul illustrate Caterpillar's growing impact in the market for solar power solutions, said Rob Schueffner, sales manager for Caterpillar's Global Power Solutions Division.

"By combining our technologically advanced solar solutions with the expertise and responsiveness of the Cat dealer network, we can offer a robust solar offering that delivers the same performance and reliability that customers have come to expect from our traditional power generation lineup," Schueffner said. 

EXTENDED SERVICE COVERAGE

PROTECT YOUR CAT® ENGINE & GENERATOR SET

Your operation depends on reliable power, which is why you trust Cat engines and generator sets to keep your business moving forward. With added support from us, you can secure additional coverage that's just as durable and long-lasting. Extended Service Coverage (ESC) for new, used and overhauled prime and rental generator sets protects your investment and provides peace of mind.

||||| Choosing coverage is as easy as following these four steps: |||||

1. Choose from a variety of coverage options

Extend your protection beyond the original factory warranty by choosing the coverage option that's right for your situation.

- **New ESC:** Coverage for engines and generator sets is available in a variety of increments, if purchased before the end of your original factory warranty.
- **Advantage ESC:** Coverage is available after the end of the original factory warranty in various increments, before the first overhaul.
- **Overhaul ESC:** Coverage is available in a variety of increments, and eligibility is determined once a qualifying overhaul has been completed by an authorized Cat dealer in accordance with the Overhaul ESC Checklist.


2. Identify your coverage needs

Next, determine the age and current operating hours of your engine or generator set since the delivery or overhaul. You'll also need to calculate the expected annual hours of use to choose the best ESC coverage terms to fit your needs.

3. Select your coverage level

Then, choose from our Silver, Gold, Platinum or Platinum Plus coverage levels (New and Advantage ESC only) to get the exact amount of protection you need. Overhaul ESC options are also available. Contact our dealership for details.

4. Purchase and register your ESC

Work with our dealership to complete the coverage process—and get the protection and peace of mind you deserve. 



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OUR EXPERTS WILL HELP YOU GET THE JOB DONE—RIGHT

Whether you're installing a backup generator for your small business, working with an engineering firm to upgrade your manufacturing plant, or designing a new power station from ground up, our Power Systems experts can provide the right level of expertise and support—when you need them. Depend on our experts to help you:

- Reduce risks and delays that could impact your timeline
- Understand and assist with obtaining the necessary permits and approvals
- Manage proper installation
- Provide startup services and reliability testing
- Provide training to facility personnel as necessary

Contact the Power Systems experts at our dealership for more information.