RUNREADY™

TOROMONT Power Systems
CAT®

www.toromontpowersystems.com

BASIC FUEL SYSTEM CHECKLIST ☑

Startup issues are the number one cause of generator set failures. While battery failures are a leading cause, you need to also pay close attention to the fuel system. Old or contaminated diesel fuel, a clogged fuel filter and old or cracked hoses are factors that can prevent your genset from starting.

To ensure reliable startup, inspecting the fuel system on your generator set should be performed on a weekly basis. The best way to keep track of maintenance intervals is to use the run-time meter on the generator set to keep an accurate log of all services performed.

The following is a basic checklist you can follow to keep your fuel system in good working order.

☑ Inspect the fuel supply lines, return lines, filters, and fittings for leaks. Check any flexible sections for cuts, cracks, and abrasions, and make sure they are not rubbing against anything that could cause breakage.

☑ Ensure there is no air in the fuel system. This is a common problem with newer generators that are not run on a regular basis. Closer tolerances within the fuel systems designed to meet today's emission requirements make fuel systems more susceptible to air affecting startup.

☑ Diesel fuel is inherently unstable, and this instability causes diesel fuels to form sludge and/or insoluble organic particulates. Both asphaltene compounds (sludge) and particulates may contribute to build up in injectors and particulates can clog fuel filters, plus add to the service issues common to diesel engines. Change fuel filters every 200 to 250 hours, depending on environmental conditions and how clean the fuel is. At a minimum, change the filter on an annual basis.

☑ Use a diesel fuel conditioning or cleaning system. Such cleaning and recirculation systems are available from your Cat dealer. These systems typically use well-known, multi-stage separation processes, including coalescence and/or centrifugal principles to clean larger volumes of fuel.

☑ Make sure that mechanical fuel-level gauges are functional and accurate.

☑ Make sure fuel-level alarms are tested for functionality.

☑ Ensure that you have a reputable and reliable fuel supplier, particularly one that receives their fuel as close to the pipeline as possible.

For assistance with maintaining and checking your fuel system, contact our dealership.

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DESIGN FOR SAVINGS

TAKING A STEP BACK CAN MOVE YOUR GREEN DESIGN FORWARD

Would you like to save five percent per year on your data center energy bill?

Designing a site for power distribution will have a significant impact on your energy bill. Re-thinking site design, as well as considering your many options for power distribution equipment (transformers, switchgear, panel boards and UPS) can yield real energy savings.

Green design philosophies and mission critical facility designs often have conflicting goals. Green designs look to operate equipment at peak efficiency ranges, often near 100 percent of the equipment rating. Mission critical designs focus on 24/7/365 availability.

To achieve high levels of availability, design engineers are using redundant components—N+1, N+2 and 2N are not uncommon. In a 2N design, power distribution equipment operates at loads of 50 percent (or less) of the equipment nameplate rating, which may decrease the equipment efficiency. Take a typical double conversion UPS. At rated load, the UPS will operate at 92 to 95 percent efficiency, but at half load the efficiency of the UPS could be as low as 85 percent.

There are several benefits to a green power distribution design, including:

- Increased equipment utilization, operating at higher efficiencies
- New efficiencies gained through atypical technologies
- Reduced energy usage
- Decreased carbon footprint

There are also associated challenges above and beyond traditional designs:

- Gaining acceptance to utilize (or even consider) newer, high efficiency technologies that are not normally applied in mission critical applications
- Designs become more complex to achieve the same level of reliability

If you decide the green path is the right direction for your facility, taking a little extra time on the front end will likely result in the best (and most cost-effective) solution.

Considerations when developing a new mission critical design include:

1. *Define and understand your loads.* Make sure you know the average and peak power consumption—not just the nameplate rating.

2. *Once the loads are defined, determine how critical each one is.* Does the load truly require uninterruptible power, or can a momentary power outage be tolerated? What about outages of up to 30 seconds?

3. *Develop initial designs,* with special attention to the selection of each and every component to drive incremental improvements in efficiency. For example, you may consider using a high-efficiency flywheel UPS as part of your power system.

4. *Once equipment has been selected,* work with the equipment suppliers to determine if additional efficiency gains can be achieved.

For more information on designing your data center, please contact our dealership.

SUSTAINABLE SOLUTION

CAT® MICROGRID REDUCES POWER COSTS FOR OFF-GRID TUCSON PROVING GROUND

Nearly 25 years ago, Caterpillar opened a proving ground about 30 miles southwest of Tucson, Ariz. The facility consists of large open-air test areas, where Caterpillar conducts field trials of large mining equipment before being brought to market. The proving ground site also includes workshops and an office building.

The Green Valley area outside of Tucson is an ideal testing location for Caterpillar's mining division, but the site is too remote to be easily connected to an existing utility grid.

To generate electricity, Caterpillar relied on three Cat® C15 diesel generator sets that ran continuously all year long, using approximately 250,000 gallons of diesel fuel each year. It was clear the facility needed an alternate power solution to reduce costs and align with the organization's sustainability efforts.

Launched in 2016, Cat Microgrid technology offers an integrated suite of environmentally friendly solar panels, state-of-the-art energy storage and advanced monitoring and control systems; along with Caterpillar's traditional line of power generation equipment, including Cat generator sets, switchgear, uninterruptible power supplies and automatic transfer switches.

At the Tucson Proving Ground (TPG), facility managers worked with local Cat dealer, Empire Power Systems, to install 528 kWp DC (500 kWp AC) of photovoltaic (PV) solar panels and 500 kW of short-term energy storage in the form of batteries and ultra capacitors to supplement the power generated by the existing generator sets.

Empire Power Systems was the original installer of the generator sets at TPG and is responsible for complete microgrid maintenance at the site.

"With the declining cost of renewable energy sources and rapid advances in

CUSTOMER
Caterpillar Tucson Proving Ground

LOCATION
Tucson, Ariz., USA

CUSTOMER BUSINESS ISSUE
Reduce power generation costs for off-grid mining equipment test facility

SOLUTION
Cat Microgrid Technology Suite

- 500 kW solar array
- Energy storage system with lithium ion and ultra capacitors

CAT DEALER
Empire Power Systems

energy storage technology, the time was right to provide an integrated application for remote power at the Tucson Proving Ground," said Rick Rathe, general manager of new ventures for Caterpillar's Electric Power business. "Cat Microgrid technologies deliver an innovative, financially viable way to incorporate sustainable sources of energy into our existing portfolio of traditional power generation offerings."

In a hybrid microgrid—like the one at TPG—renewable sources of energy can account for any percentage of the load depending on conditions. Excess energy produced by renewables is stored for stabilization, as well as for use during unfavorable conditions, such as cloudy days and nighttime. Generator sets supplement the system by powering the microgrid when energy from other sources is unavailable.

Located in a remote Arizona desert, the sun conditions at TPG are ideal for solar power generation. The site has both fixed solar panels and tracking solar panels, which follow the movement of the sun throughout the day.

With the addition of solar panels and energy storage to its microgrid, TPG expects to reduce its diesel fuel use by 33 percent and its generator set operation by 25 percent.

Besides reducing fuel and operating costs for the facility, the microgrid at TPG is a real-world application of Caterpillar's latest technology for the commercial market.

Available worldwide through the Cat dealer network, Cat Microgrid technologies can be purchased as turnkey installations or design-to-order solutions. This suite of technologies is ideal for a broad range of applications such as powering telecommunications towers, industrial facilities,mining installations, remote villages and islands, rural communities and off-grid sites like TPG.

DATA CENTER INNOVATION

RELIABLE POWER WITH LOW OPERATING COSTS

CUSTOMER PROFILE

ENN ENERGY SERVICE (SHANGHAI) CO., LTD.

Site Location: Shanghai, China

Cat® Equipment: Two Cat G3520H gas generator sets

The Shanghai Tencent Cloud Data Center (TCDC) is one of the most advanced service platforms for cloud computing and cloud storage infrastructures in the Asia-Pacific region.

TCDC uses the latest modular data center technologies and other advanced cloud computing technologies. It serves the needs of TCDC, while simultaneously providing cloud platform integrated services for third-party enterprises and domestic Internet users, and e-commerce services for the local government.

A total grid supply capacity of 40 MVA is provided to TCDC by the local state grid. However, this only supports Phase 1 and 2 of TCDC's operations. Phase 3 and 4 faced significant shortfalls in terms of power, which then required an alternate source of reliable, steady and cost-effective power to simultaneously provide cooling load capacity.

TCDC has four independent data center blocks. Each block has two 10 kV bus

bars connected to the grid with eight 2,500 kVA transformers at 50% load capacity. Each block also has five 2,000 kW diesel fueled generator sets providing standby power. This is coupled with a 7.5 MW uninterruptible power supply (UPS) system for emergency power. The load distribution includes 7 MW for the servers, 0.5 MW for the auxiliary equipment, and 2.5 MW for the HVAC, office and lighting systems. The total operational capacity is 10 MW.

ENN is the energy management company for the Shanghai TCDC. ENN specializes in using natural gas as the fuel for its distributed generation (DG) projects. ENN invests, designs, builds and operates its own DG sites throughout China.

With gas engine generator sets as the basis for power generation, ENN recovers the waste heat (from both the jacket water and the exhaust) in the form of hot water and exhaust gas, which together feed into lithium bromide (LiBr) absorption chillers to produce chilled water for the heat recovery system. By recovering the waste heat while producing power, the combined cooling, heating and power (CCHP) system is able to simultaneously provide both power and chilled water to TCDC, meeting all power and cooling needs.

TCDC is one of the very first to use natural gas power CCHP systems for its power and cooling needs. The advanced natural gas based CCHP system provides a clean, green, efficient and cost-effective solution for demanding data center requirements.

The TCDC CCHP cascade energy utilization system is only possible with the use of an integrated energy management system incorporating advanced natural gas engine generator sets and LiBr absorption chiller technologies.

The solution

The Shanghai TCDC natural gas distributed generation project has an installed capacity of 10 MW. For Phase 1, two Cat® G3520H gas engine generator sets with a full load rating of 2,500 kW were installed. Commissioning was completed in August 2016. Their high reliability, efficiency and low operating and maintenance costs deliver maximum benefits.

The gas generator sets are parallel to the municipal grid, connected with no injection mode. The produced power provides partial power to the data center, while the thermal energy from the high-temperature exhaust gas and hot jacket water is recovered in the absorption chiller to produce 7°C cooling water to meet the data center's cooling load demand. Additionally, the system is equipped with cold storage tanks used to improve cooling system reliability for peak shaving.

The Cat G3520H gas generator sets can operate with a variety of load conditions. They also can operate under island mode and with black start function, so they can start and operate without any external power supply. Island mode operation is designed for 200 hours annually.

The engine is capable of NOx emissions of 250 mg/Nm3 (at 5% O2) meeting the current local air emissions regulations. There is also reserved space for the installation of a de-NOx system, should it be necessary in the future.

To further minimize environmental impact, the G3520H gas engine generators are housed in an acoustic attenuation enclosure, allowing compliance with local industrial environment sound/noise regulations.

The adoption of a DG CCHP system not only secured the stability and reliability of the power supply for TCDC, but it also uses heat recovery to make possible a cost-effective chilled water supply. This highly efficient use of the natural gas as the energy resource reduces the carbon footprint of the existing conventional utilities.

Results

When compared to conventional coal-fired power plants of the same capacity, 3,470 tons of conventional coal burning is saved with a reduction of 23,300 tons of CO_2 emissions (or 48% reduction in CO_2 emissions), and also the reduction of 466 tons of SO_2 and 79 tons of NOx emissions (or a 60.8% reduction in NOx emissions).

This project provides both energy savings and emission reductions. Compared with conventional coal-burning energy systems, the adoption of DG CCHP systems has the potential to save more than 18% in overall energy. Emissions of various pollutions, such as PM2.5 particulates, were reduced by over 60% and the annual emission reduction of CO_2 is roughly 23,300 tons.

G3512 GENERATOR SET

New Cat® genset for continuous applications

The latest variant of the Cat® G3512 is targeted for flexible applications, where a single unit is used for both standby and load management operations.

The G3512 is engineered to meet a full suite of critical market standards including NFPA 110 Level 1 Type 10 compatibility, a UL 2200 listing, as well as NSPS Non-Emergency emissions requirements. Rated for continuous power at 750 kW or 1000 kW at 60 Hz, the generator set is a good match for the non-emergency emissions market in North America.

Ideal for load management and hybrid applications, the G3512 is well suited to meet the power requirements for office buildings, data centers, retail complexes, schools, government buildings, universities and research facilities.

With an updated package design, the G3512 is modeled after the diesel solution to minimize installation costs and commissioning time on-site. A high-power density 12-cylinder engine offers market-leading load acceptance and transient response. Designed for reliability, this engine is built on the established 3500 engine platform technology and features a robust design with steel pistons and a protection monitoring system.

Featuring Caterpillar's new EMCP 4.3 generator set controller, the G3512 easily integrates with building management systems. The expanded set of features also includes complete SR5 generators, gas train, package-mounted radiators and simplified wiring connections.

The G3512 is compatible with NFPA 110 Level 1 Type 10 applications, where backup power is required for mandatory building functions such as egress lighting, elevators, ventilation or data equipment. The G3512 generator set starts and accepts power load in as quickly as 6.5 seconds, depending on conditions at the site.

Cat gas standby generator sets are designed for industry-leading dependability and rapid response. Each one is factory tested and backed with Cat dealer support. Gas standby generator sets are backed by a two-year standard standby warranty—up to 500 hours per year.

For more information, contact the power systems experts at our dealership, or visit www.cat.com/GasStandbyGenerators.

FUELING INNOVATION

MUNICIPALITY INSTALLS BI-FUEL GENSET IN THE WAKE OF SUPERSTORM SANDY

Five years after it devastated the East Coast, the impact from Superstorm Sandy is still reverberating in the greater New York-New Jersey metro area.

For the City of Linden, New Jersey—a municipality 13 miles southwest of Manhattan with a population of more than 40,000—the storm underlined the need for a new source of emergency power.

"Immediately after Sandy hit, we were down for the better part of two weeks—for about 10 days we were 100 percent without grid power," recalls Al MacDonald, director of public property and community services for the City of Linden.

"So we relied on a generator that dates back to the 1970s that was only for emergency power in the building and our 911 call center," MacDonald said. "Our electrician was running around putting in smaller generators just to get other offices up and running, and it was just not a feasible situation."

Linden's city hall building houses the police department, municipal court, the tax and treasury offices, along with engineering and the mayor's office. It also houses the 911 dispatch center, and is the central location for most of the servers for the city's computer system.

Continued on page 10

"It was obvious that city hall had a generator issue because of its age and what it lacked in power," MacDonald says. "We've had interruptions in the past, and fortunately we were pretty lucky with that old generator. We didn't lose the critical systems like 911 dispatch and our computer system, but everything else pretty much came to a standstill at city hall."

City officials discussed getting a new generator as far back as 1999, but budget constraints and other priorites kept them from taking action until recently. The experience gained from going through Superstorm Sandy was the catalyst that prompted Linden officials to take action, MacDonald said.

CUSTOMER PROFILE

City of Linden

Site Location: Linden, N.J.

Application: Emergency backup power, demand response

Cat® Equipment: C27 Bi-Fuel Generator Set

The City of Linden, NJ

***(L)* A Cat C27 generator set is placed on a pad behind the City of Linden parking structure. *(M)* The genset enclosure is lowered into position. *(R)* Finished product blends in with surroundings.**

Dual fuel option

Based on the recommendation of engineering firm CME Associates, this spring the City of Linden opted to install a Cat® C27 generator set equipped with bi-fuel technology that enables the genset to run on both diesel and gas fuel.

"We felt that it would be economically advantageous to have a bi-fuel generator with the capability to provide power during emergency utility outages, as well as for non-emergency purposes," MacDonald said. "Our environmental consultant, Greener By Design, advised us that a bi-fuel generator with emissions controls would provide flexibility to participate in non-emergency energy market applications such as demand response, as well as mitigate risks related to diesel fuel delivery that had been an issue in the past."

Demand response helps to relieve stress on the utility grid by incenting customers to reduce utility power consumption. During times of peak demand, such as hot summer days, demand can exceed generating capacity from the utility.

When a demand reduction request is signaled, the customer may adjust power demand by postponing some tasks that require large amounts of electric power, or may decide to pay a higher price for their electricity. Some customers may switch part of their consumption to alternate sources, such as on-site power generation.

"Our research showed other facilities that have done a similar setup have offset their costs tremendously over a long period of time," MacDonald said.

"We felt that it would be economically advantageous to have a bi-fuel generator with the demand response capability."

AL MacDONALD
Director of Public Property and Community Services
City of Linden

"By participating in the energy market programs during times of peak usage, we anticipate recovering our cost over the long term."

Bi-fuel generators extend run times and mitigate refueling issues by operating on a mixture of diesel and natural gas. A large percentage of the diesel fuel is substituted with pipeline natural gas. This results in extended run times. In fact, a bi-fuel can provide at least twice the amout of run time from a stored volume of diesel fuel. That means less onsite diesel fuel is required.

In the wake of Sandy, which knocked out the utility grid for anywhere from five to 10 days in the New York metropolitan area, scores of backup diesel generator sets ran out of fuel, their users unable to receive another shipment of fuel due to blocked roads and delays at terminals.

Foley Power Systems in Piscataway, N.J., provided the City of Linden with the Cat gensets.

"During events like Sandy where they were down for 10 days, a bi-fuel system equipped with a multi-day tank of diesel fuel could have provided them full-time emergency power without having to fill the diesel fuel more than once," said Scott Yappen, Director of Business Development with Foley Power Systems. "So this bi-fuel solution should keep the City of Linden run ready for decades to come."

Because Linden intends to use the generator in emergency and non-emergency modes, the municipality is required to have emissions exhaust reduction equipment in order to comply with environmental regulations. This was accomplished by mounting a Selective Catalytic Reduction (SCR) system on the roof of the generator enclosure.

The Cat generator is located outdoors in a sound-attenuated enclosure behind the municipal garage, and faces a residential area.

"We were concerned about the level of noise from a generator of this size, especially if we are running in the middle of the day," MacDonald said.

A third party contracted through Foley Power Systems provided a sound-attenuated enclosure, which more than meets the local noise standard and will be sufficiently quiet such that the neighbors won't be bothered when the generator runs.

Eric Lavin *(L)* of Foley Power Systems reviews plans with Al MacDonald.

Co-op purchasing

The city was able to save time and money—plus get a quality piece of equipment—by utilizing National Joint Powers Alliance (NJPA) cooperative purchasing.

As a national municipal contracting agency, NJPA is a public agency serving nearly 50,000 member agencies across the country. NJPA establishes and provides nationally leveraged and competitively solicited purchasing contracts from industry-leading vendors. These cooperative contracts offer both time and money savings for their users by consolidating the efforts of numerous individually prepared solicitations into one national, cooperatively shared process.

"The bidding process with a municipality or any other government agency is lengthy, and you don't always get exactly what you originally specify," MacDonald said. "So if you don't go over the bid with a fine-tooth comb, you can potentially wind up with some issues, and we have had some experience with that in the past from other vendors.

"With NJPA, the bidding is already done for you so you know that you're getting the best price for the piece of equipment that you spec out and that you want," he said. "So not only did we get the best price, we got exactly what we specified."

The City of Linden will rely on Foley Power Systems to maintain the C27 genset through a Customer Support Agreement.

"I think that's the way to go for a very small amount of money," MacDonald says. "For a piece of equipment this critical to the continued operation of vital city systems and departments, it would have been foolish for us to not go with a maintenance agreement."

While the City of Linden has had a mutually beneficial relationship with Foley in procuring and maintaining Cat construction equipment, this was their first experience with Foley Power Systems.

"They've been on top of the entire project from front to back," MacDonald said. "They facilitated the interconnection with the electric utility—which required a lot of coordination—and also with the gas utility. "We've really had to do very little as far as the municipality is concerned other than just provide basic assistance.

"We're more than pleased with how the whole project has been handled."

MOST DEPENDABLE

WHEN IT COMES TO GENERATOR SALES, SERVICE AND SUPPORT, LOUISIANA'S LEADING ELECTRICAL CONTRACTOR PARTNERS WITH THE BEST

For more than 70 years, Ernest P. Breaux Electrical has remained dedicated to meeting the electrical contracting needs of the Gulf Coast region.

Based in New Iberia, La., E.P. Breaux specializes in commercial, utility, industrial and communications projects, and has the resources to provide the industry's highest quality at a competitive cost.

With a staff of 370 employees, E.P. Breaux is licensed in 13 southern states. The commercial division does electrical work in stadiums and sports arenas, hospital complexes, retail buildings, municipal facilities, roadway and bridge projects, just to name a few.

The electrical utility division is capable of providing complete substation installations including site preparation, fencing, foundations, framing, structure erection, electrical equipment installation, wire pulling, conductor testing, buss work, concrete pull boxes, duct banks, HV and control wiring, control building, stone surfacing and line commissions up to 500 kv.

The industrial division performs work at airports, wastewater treatment plants and installs street lighting. The communications division is equipped and ready to complete large and complex communication projects including fiber optic cable installation and data projects.

"We strive to be the most qualified, best trained and most competitive electrical contractor, providing reliable professional services in a timely and cost effective manner," says David Bell, president of the commercial division, which accounts for about 60 percent of


Lafayette General Medical Center

sales. "Our goal is always to provide a best-in-class installation at a competitive price, on time and on budget."

For six decades, the company has been recognized by customers as the "Most Dependable" electrical contractor in the region, and has earned a reputation for providing the best quality service available in the industry.

"I would say we're a legacy company," Bell says. "E.P. Breaux started out very family-oriented and grew over the years. It has transitioned through some acquisitions and buybacks to a company with annual revenue of about $90-$100 million."

The contractor offers design/build services, preliminary project estimates, cost/contract negotiations, and can provide firm bid quotations relative to project requirements.

It also has a complete electrical supply warehouse on site and an onsite electrical training center to produce the most knowledgeable, skilled and dependable staff in the industry.

"A big part of our core values is our training program," Bell says. "We have probably the strongest training program in the state. We also have our own in-house apprenticeship which is is an ABC-certified program. We train about one-third of the apprentices that are trained through ABC in the entire state. And we train in house, so that's our key."

Additionally, E.P. Breaux's electrical service department provides 24-hour, on-call service with the ability to travel out-of-state when customers require it.

The company places a premium on safety, making it a point of emphasis as part of its apprentice program. All employees go through OSHA 10 training, and foremen receive OSHA 30 training. E.P. Breaux recorded 1.2 million man hours without an incident.

"We have a staff of field inspectors, but we don't look at it that way," Bell says. "The way we view it, every employee is part of a safety inspection. We look out for each other at all times. Next to our completed projects in the field, our biggest accomplishment is safety."

Vendor relationships key

E.P. Breaux places a high value on relationships with employees and customers.

"Business is about relationships, and we treat our vendors as customers—they help us," Bell says. "We operate in high-bid markets, so vendor relationships are crucial. Vendors are really a key player at bid day, and the relationship that we develop with them helps us get work. We partner well together and it brings a great benefit."

E.P. Breaux has maintained a vendor relationship with Louisiana Cat for about 15 years. Engineering firms have a preference for Cat® generator sets, as more often than not they appear in the specifications when a genset is called for on a project.

"We always try to secure prior approval for a Cat engine package if it's not already specified," Bell says. "The good thing is the relationship we have with local engineering firms is very solid, and with Louisiana Cat as well, so the Cat product line is usually already included in the specifications.

"With Louisiana Cat, you have a combination of the product, startup and support services that are the strongest in the field," he adds. "And then it gets down to relationships we have with the sales, design and engineering teams that they have in house."

E.P. Breaux is often selling not just generator sets, but integrated gear packages. So when it involves two paralleling generators and switchgear,

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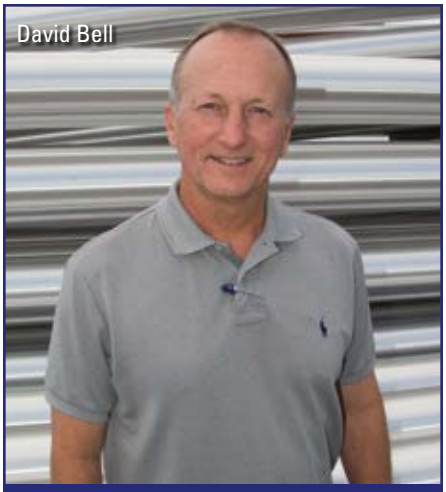
David Bell

CUSTOMER PROFILE

Ernest P. Breaux Electrical

Location: New Iberia, La.

Role: Electrical contractor

that requires a design change as well as offering in-house switchgear products, Bell says.

"So we try to package that as much as we can," he says. "And the relationships we have outside of sales, when you get into engineering and design is a real benefit to us."

Commissioning assistance

In a larger project that includes one or more generator sets, E.P. Breaux technicians will do the installation and make the electrical connections. Then it becomes a team effort for final connection, commissioning and startup with the technicians from Louisiana Cat assisting.

"We'll go through each part of the switchgear and the generators, double check everything and make sure it has oil in it and make sure the fuel levels are right," says Corey Dupuis, a sales rep with Louisiana Cat Power Systems. "Then we do the startup and get the package commissioned before it's turned over to the end user."

When it comes to hospital installations, the commissioning process is especially critical due to the large electrical service involved, and the fact that continuous power is required to keep some patients alive.

"Having a product that has been pre-checked, and pre-functioned at the factory is a big part of the success we've had with Cat gensets," Bell says.

"The commissioning and startup service from Louisiana Cat is by far the strongest in our area, so that's a real benefit for us," he adds. "Our foremen probably know all the service techs by name. So there's a lot of confidence in the service side from Louisiana Cat after the sale."

Wide range of choices

Another advantage Bell cites is the wide spectrum of Cat generators from which to choose. Ranging from smaller generator sets to larger units, and from natural gas to diesel, the product line is extensive and provides E.P. Breaux with plenty of options on various projects, Bell says.

E.P. Breaux has installed more than 100 Cat generator sets within its commercial division, and still more within the industrial sector, Bell says.

"The reason for it is product quality and product support," Bell says. "Once you start selling Cat products you see that you have outstanding service from the dealer after the sale of a product.

"Then you have an owner that says they have a lot of satisfaction and a lot of reliability with the generator packages, such as in hospitals. And that's huge for us, because it can result in repeat business."

> **"Having a product that has been pre-checked, and pre-functioned at the factory is a big part of the success we've had with Cat gensets."**
>
> **DAVID BELL**
> President of Commercial Division
> E.P. Breaux

Our Lady of Lourdes Regional Medical Center

FACTORY ACCEPTANCE TESTING

At Caterpillar, we welcome the opportunity to demonstrate our state-of-the-art generator set testing and engineering facilities. Every Cat® generator set undergoes a rigorous series of factory tests, and this also applies for a customized solutions package.

More than twenty test cells are dedicated to special testing, with the capacity to test open, canopied, and containerized generator sets at both inductive and resistive loads.

Using up to 12 MW resistive capacity, a 3 MVAr inductive capacity and a 750 kVAr capacitive capacity, we can test low and high voltage generator sets and multiple units synchronized together, running with their associated controls and switchgear equipment, simulating site conditions and installations.

We offer cooling system performance, vibration, noise, a full range of special electrical tests, and monitor fuel consumption during a factory acceptance test. The facility also has a dedicated area to build and test special control panels, complete PLC and switchgear suites.

During the testing of your generator sets, a video monitoring system is available for you to comfortably and safely watch the test. A Cat project manager is assigned to each project from the point of sale. This person will arrange your factory acceptance test and guide you through the process.

The test begins with a health and safety induction, where all personal protective equipment required throughout your test is supplied. Next, you'll be taken to the test cell for a visual inspection of your generator set.

Test Procedure

We begin by testing the impact load acceptance to demonstrate that the response of the generator to loads meets the specified limits of rated voltage, frequency, and recovery time. You can monitor the transient graphs for voltage and frequency in real time.

During the second stage, we prove the full functionality of the generator by simulating the protection alarms and shutdowns, so you can visualise the operation and safety of your generator set, giving you total confidence that it won't let you down in the field.

The final stage is the load-proving test. We demonstrate the capability of your generator to continuously carry rated load for a period of time, depending on the required continuous or standby ratings. Key parameter readings are taken at regular intervals specific to your requirements.

See for yourself why your Cat generator is your best investment. We invite you to come and see our industry-leading facilities and witness your generator package being tested.

For more information on factory witness testing, please contact our dealership.

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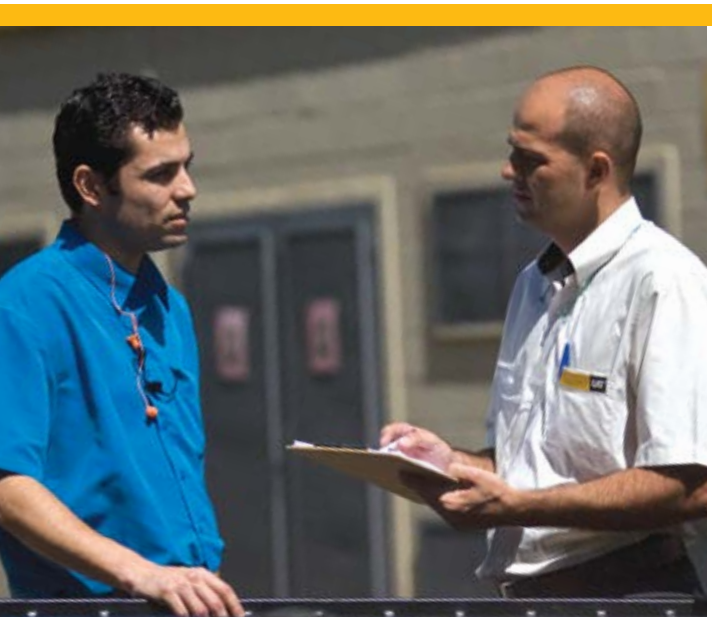

OUR EXPERTS WILL HELP YOU GET THE JOB DONE—RIGHT

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 it. Depend on our experts to help you:

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

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