RUNREADY™

SPACE SAVER

Onboard paralleling reduces cost and footprint

Read the story: 4

TOROMONT Power Systems

CAT®

www.toromontpowersystems.com

ASSESSING CHP

IT ALL COMES DOWN TO PROJECT ECONOMICS

While local power reliability can be a key driver behind choosing a combined heat and power (CHP) system, the decision to proceed with a project generally comes down to economics: Will savings on energy costs and revenue from electricity generated provide an adequate return on the investment in the equipment and its operation?

A key factor that can favor gas-fueled CHP is the spark spread—a common metric for estimating the profitability of natural gas-fired electric generators. The spark spread is the difference between the price received by a generator for electricity produced and the cost of the natural gas needed to produce that electricity. It is typically calculated using daily spot prices for natural gas and power at various regional trading points.

The outlook is most favorable where the spark spread is large: fuel prices relatively low and electricity cost relatively high.

A key component of the spark spread equation is the heat rate, or measure of efficiency, of a generating unit. A generator that uses 7,000 BTU to produce one kW has a conversion efficiency slightly below 50 percent. Less efficient units have higher heat rates and therefore require more natural gas to produce a kW of electricity.

For project financing, lenders typically require a project to generate 1.5 times the cash needed to cover the debt obligation—after taxes and all expenses—during each year of the project loan.

A project lender will require a detailed financial model that clearly shows all assumptions and follows generally accepted accounting principles to portray the project economics accurately. The model should be user-friendly to enable the lender to review various "what-if" scenarios and test the strengths and weaknesses of the project economics.

Revenue side

Base revenue amounts on the value of the net kilowatt-hours and therms produced and sold. That, in turn, depends upon:

- **Availability -** Revenue is lost anytime the CHP equipment does not operate, such as during maintenance and repairs, or at times when the fuel supply is reduced or interrupted.

- **Load factor -** Ideally, the generating equipment operates at full-rated load; a fuel supply shortfall or a decline in fuel quality will restrict output and revenue.

- **Derates -** Overheating, high ambient temperature and high altitude may keep the generating equipment from achieving its nameplate capacity rating.

Revenue also includes incentives such as government grants and tax breaks and utility-sponsored rebates or special renewable energy tariffs.

Expense side

On the opposite side of the ledger are owning and operating expenses:

- **Fuel -** This typically is the largest item at 60 to 80 percent of project operating cost (unless an "opportunity fuel" is available).

- **Capital expense -** This includes the initial cost of generating and heat recovery equipment, fuel production, interest during construction, legal and development costs, funding for cost overruns, interest rate, loan amortization, and management of the project schedule.

- **Operating expense -** This includes staffing, replacement components, supplies and consumables, engine/generator set and facility maintenance and repairs, periodic engine overhauls, and taxes.

From the total of these costs, a thermal credit is deducted—the economic value of the recoverable heat.

Maintenance and repairs are an expense over which project owners

WHEN DOES CHP PROSPER?

- The system operates with a high electrical and heat and/or chilling load factor
- Electric and thermal loads coincide during a typical day
- The site requires high reliability and power quality
- The CHP system can double as a standby power source
- Low emissions are important

RunReady™ is published by High Velocity Communications Inc. on behalf of your Cat® Dealer. Publisher, Mark Sell • Editorial Director, John Rondy • Senior Art Director, Eric Valk • Director of Client Services, Kelly Pemper. Every attempt has been made to ensure specifications are accurate. Because specifications are subject to change without notice, check with us, your Cat Dealer, for the latest information. Some photography provided courtesy of Caterpillar Inc. CAT, CATERPILLAR, their respective logos, "Caterpillar Yellow," and the POWER EDGE trade dress, **BUILT FOR IT** as well as corporate and product identity used herein, are trademarks of Caterpillar and may not be used without permission. High Velocity Communications Inc., 1720 Dolphin Drive, Suite D, Waukesha, WI 53186-1489. RunReady is a trademark of High Velocity Communications Inc. Phone 262.544.6600. Please submit address corrections and changes via email to: Kelly@HighVelocityCommunications.com. **Volume 9, Number 3.**

have substantial control. Predictive maintenance can help extend generator set service and overhaul intervals and reduce service costs by up to 15 percent.

Good predictive practices include regular oil analysis to help optimize service intervals; monitoring trends like valve recession, oil consumption and emissions to fine-tune overhaul schedules; and use of tools like vibration analysis and infrared thermography to detect trouble before failures happen.

Any economic analysis needs to consider potential revenue stream risks (decline in gas volume or quality, power line outages that interrupt power sales) and upsides (more and better-quality gas than expected, favorable renegotiation of the energy purchase agreement or fuel supply pricing, greater-than-expected equipment availability).

One way to simplify a CHP project is to work with a partner well qualified to manage a number of the basic risks—such as an engine-generator manufacturer with a diverse technology portfolio, a well-developed dealer network and a strong financing arm. Caterpillar and its worldwide dealer network bring to bear the following:

- **A variety of generating technologies** in a broad range of power ratings to suit many applications. This can include engines designed specifically to operate on low-energy biofuels, and engines custom engineered for local ambient conditions, altitude, fuel quality, and site-specific performance objectives.

- **Dealerships with broad experience** in operating and maintaining power generation equipment and with locally based service technicians. Such dealers can offer a wide range of service programs, from basic planned maintenance and overhauls to comprehensive long-term service agreements.

- **Dealerships that are able to manage whole-project engineering,** procurement, and construction and supply all engines and generators, plus transformers, heat recovery equipment, switchgear, gas treatment systems, and other ancillary equipment.

- **Diverse financing capability** that includes intimate knowledge of the special needs of power projects in general and CHP projects in particular. This can include expertise in financing small projects ($5 million or less); knowledge of development processes, project economics, and incentive programs in each country; capacity to finance entire projects rather than equipment only; and flexible financing approaches to suit specific customer needs.

To determine if a cogeneration system fits your needs, contact the power systems experts at our dealership.

GET ONBOARD

PARALLELING GENERATOR SETS WITHOUT SWITCHGEAR SAVES VALUABLE SPACE, AND COST

Less than two years ago, Mercy Health Muskegon installed a backup power system on its hospital campus in West Michigan that includes the use of onboard controls to parallel four 1 MW gensets.

The onboard controls from Caterpillar eliminate the need for traditional paralleling switchgear, enabling the system to have a smaller, space-saving footprint. Another benefit of integrating discrete paralleling control devices and programmable logic controllers is a lower project capital cost.

"Mercy Health was looking at all the newest technologies, and they decided that the onboard paralleling system was the best way to give them what they needed and still have the reliability and the footprint that was required with the space they had available," said Mark Wild, an account manager with Michigan Cat, which supplied the generator sets and onboard controls to Mercy.

CUSTOMER PROFILE

Mercy Health Muskegon

Location: Muskegon, Mich.

Application: Hospital standby power

Cat® Equipment: C32 diesel 1 MW generator sets (4), Multi-Generator Data Link system (MGDL) for onboard paralleling utilizing EMCP 4.4 control system

MERCY HEALTH

Four new Cat® C32 diesel generator sets were commissioned in late 2016 as part of Mercy Health's 11-story tower expansion, which will open in phases beginning this fall. The generators were sized to meet the load of the expanded hospital, and replaced two 1970's vintage Cat gensets that the hospital relied on for 47 years.

The decision to utilize onboard paralleling and forego traditional paralleling switchgear was driven by limited space in Mercy Health's new power building, said Jerry Booth, environmental care leader for the 267-bed hospital.

"We didn't have much room to work with here," Booth said. "We had to build a separate place to store everything, and Michigan Cat helped us with the planning. Cost is a huge deal in all hospitals.

"We weren't sure if we were comfortable with it in the beginning, but after meeting with the engineers and Michigan Cat, and talking to some other people who successfully utilize it, we felt comfortable with the decision to forego the switchgear," Booth said. "We've used onboard paralleling for a year and a half now and it works great, we've had no issues. Onboard paralleling of the generators has been awesome, and was the right decision."

Efficient load sharing

In facilities with a high demand for power, such as a hospital or data center, communication among generator sets is crucial for maintaining power levels. In these types of applications, generator sets can be electrically connected to help efficiently manage power to meet the large need. Paralleling generator sets helps ensure more efficient load sharing and load response within a network.

One way to operate power systems with paralleled generator sets is to use dedicated multi-function engine generator set controllers with integrated paralleling controls on the generator set. With the Cat® EMCP 4.4 control system, the individual controllers communicate with each other by way of an Ethernet backbone, synchronizing the generator sets through a connection to a single Ethernet switch.

According to Milo Amundson, a veteran technician with Michigan Cat, setting up the multi-generator data link (MGDL) system is essentially a plug and play exercise. The genset control panels are connected by Ethernet cables, and five different parameters are programmed through the MGDL.

"You instantly have all your generators communicating together, and then it's just a matter of establishing your set points and programming what you want," Amundson says.

"We can adjust load demands depending on the hospital's load," Amundson continues. "If the generator is under a light load, you can drop generators so that you're not running too light of a load. If the load increases, the generator will automatically start up and come on to the bus and share load with the other generators. The percentages of where that generator is going to drop and start back up and close to the bus are programmable depending on what the customer's needs are."

Continued on page 6

"It's very user friendly as far as programming and installation. That's due to the fact that it's based on the Cat ET electronic technician service tool that is used to program everything, and something that every Cat service technician is familiar with."

MILO AMUNDSON
Field Service Technician
Michigan Cat

During commissioning, Michigan Cat conducted a load bank test with all four generators paralleled at once. They were tested at 100 percent load, or 4,000 kW with a reactive load bank. A four-hour load test with reactive and resistive load at 100 percent met National Fire Protection Association (NFPA) 110 regulations.

The NFPA 110 installation acceptance test stipulates that the building load or other loads simulate the intended load for 1.5 hours, followed by a five-minute cool down period. Next, load is applied for a two-hour full-load test, with building load permitted to serve as part or all of the load, supplemented by a load bank of sufficient size to provide load equal to 100 percent of the nameplate kW rating of the emergency power system.

"We were able to make sure that the generators would share the bus," Amundson said. "Everything went well—we ran 100 percent for four hours with no issues.

"We had a pretty easy startup procedure with the 4.4 control panel," Amundson adds.

"It's very user friendly as far as programming and installation. That's due to the fact that it's based on the Cat ET electronic technician service tool that is used to program everything, and something that every Cat service technician is familiar with."

Mercy expansion

"By choosing to go with onboard paralleling, it means we were able to fit these gensets into a building where space was at an absolute premium."

JERRY BOOTH
Environmental Care Leader
Mercy Health Muskegon

Stabilizing system performance

If communication between the generator sets is lost, the Failsafe Adaptive Load Sharing/Droop Operation approach using EMCP 4.4 safely maintains stability of the emergency power system, seamlessly transitioning into failsafe mode with gradual, stable movement to a new equilibrium point.

Under this approach, the failsafe mode is triggered if communication messages from one or more EMCP 4.4 units are not received following a specified time interval. The communication loss can result from conditions such as broken wires, improper configuration, power loss to the Ethernet router or hub device, or power loss to an EMCP 4.4 unit.

If communication between controllers is lost for any reason, the patented control system intelligently switches the affected units to Failsafe Adaptive Droop, while the remaining units operate in Failsafe Isochronous Load Sharing mode. Units operating in droop mode will continue to sense load on the bus and share load proportionately to the other generator sets on the bus. Ultimately, the operating modes of each generator set in the event of a loss of communications are updated to best serve the emergency power system and protect the operating loads.

Seamless integration

Another advantage of onboard paralleling is the seamless integration that comes from utilizing one equipment vendor for a factory-installed control system. In a traditional installation, the switchgear is often provided by a third-party supplier, requiring additional setup time, site integration and maintenance.

"It represents a cost savings when it comes to preventive maintenance on these generators since they're all seamlessly integrated with Cat," says Brian Schiellerd, a product sales and service representative for Michigan Cat.

"It's Cat controls, generators and Cat engines—everything is Cat equipment," Schiellerd says. "There

is no third-party switchgear involved. When you have seamless integration like the 4.4 panel provides, then you can have a Cat technician come out who knows the whole system, and that provides a tremendous amount of value.

"It reduces the responsibility for the facility because they don't have huge costs and different vendors to deal with," Schiellerd adds. "They deal with one vendor who can handle the whole power envelope. When our technicians come out, they can work directly with everything that is part of the power system. So for the next 20, 30, or even 40 years, we can communicate and update with new firmware updates—whatever is required to ensure that the generators are run ready and up to date at any given time."

Schiellerd believes eliminating traditional paralleling switchgear in favor on onboard paralleling is an emerging trend in the healthcare industry, and potentially other applications where space is at a premium.

"When you can put the onboard controls in place and take the switchgear out, you can put something else in that footprint that a hospital or a data center might need," he says. "For these facilities, that's pretty crucial space. So anytime you can shrink that down and make things seamless and integrated, that's typically a win for the customer."

For Mercy Health's Jerry Booth, the upgrade to the new Cat gensets with onboard paralleling gives him peace of mind.

"By choosing to go with onboard paralleling, it means we were able to fit these gensets into a building where space was at an absolute premium," Booth says.

"And having the new Cat generators has just been a huge load off of our shoulders," he adds. "It's a critical piece when you're running a hospital with vulnerable patients and surgeries going on. I can sleep at night with no worries. It's just a very reliable system."

CAT® INSPECT

MAKE INSPECTIONS EASY, RIGHT IN THE PALM OF YOUR HAND

This easy-to-use application enables users to download and complete inspections and include additional information such as pictures, comments, and ratings. With machine-specific Preventive Maintenance (PM) checklists, performing recommended services at the appropriate intervals has never been easier. Never lose another paper inspection—complete and share your inspections electronically with Cat Inspect.

- Digital inspections provide real-time information for review, retention, and printing
- Optimized for mixed fleet owners: Secure inspection results for Cat and non Cat assets in one place
- Red, Yellow or Green ratings allow for quick identification of actionable items
- Prioritize repair spend-budget based on inspection results and status
- Help screens available within the inspections for applicable information
- Assign inspections and review results from various employees
- Add ratings, make comments, and take pictures during inspections
- Integrated with other systems like VisionLink® for a big picture view of your fleet

DOWNLOAD the APP

SIMPLIFY THE INSPECTION PROCESS

There is no cost to download the mobile app. The app is available for Apple devices on iOS 10 and newer, and Android devices on version 5.2 and newer.

Watch the tutorial videos to get started using the Cat Inspect mobile app or Cat Inspect Web.

cat.com/en_US/support/maintenance/cat-inspect.html

AGENT for CHANGE

CANADIAN FACILITY SAVES ON ENERGY WITH COGENERATION, BACKED BY THREE DECADES OF PRODUCT SUPPORT FROM ITS CAT® DEALER

Located on the western shore of Lake Ontario, Canada Centre for Inland Waters (CCIW) is considered one of the world's leading freshwater research facilities.

Established by the government of Canada in 1967, CCIW occupies a large waterfront site in Burlington, Ontario, just inside Hamilton Harbor. The CCIW facility houses more than 600 staff from Environment Canada, the Department of Fisheries and Oceans, the Canadian Coast Guard, and the Royal Canadian Mounted Police.

The 48,000-square-meter freshwater research facility is owned and operated by Environment and Climate Change Canada (formerly known as Environment Canada), a federal agency that is responsible for coordinating environmental policies and programs as well as preserving and enhancing the natural environment and renewable resources.

As one of two main centers within the National Water Research Institute (NWRI), CCIW is a laboratory facility that provides Environment and Climate Change Canada and the federal Department of Fisheries and Oceans (DFO) with shared facilities for environmental research and development, as well as monitoring, resource management and navigational charting.

Scientists at CCIW play a critical role in providing the knowledge necessary for the management of the Great Lakes and other aquatic ecosystems. The Freshwater Quality Monitoring

Continued on page 10

CUSTOMER PROFILE

Canada Centre for Inland Waters

Location: Burlington, Ontario, Canada

Application: Combined heat and power (CHP)

Cat® Equipment: G3516 gas generator set

Canada


Canada Centre for Inland Waters

and Surveillance Division monitors freshwater quality and ecosystem health in the Great Lakes and Hudson Bay Watershed basins. Through systematic measurements of physical, chemical and biological conditions, temporal changes and emerging issues are tracked and the results of remedial measures and regulatory decisions reported.

Energy efficiency retrofit

In partnership with electric utility Burlington Hydro, the facility has received a number of awards for energy efficiency initiatives. But 25 years ago, about 50 percent of CCIW's total annual operating and maintenance costs was spent on electricity, gas and water, totaling $1.5 million a year.

In 1993, NWRI contacted the Federal Buildings Initiative as it sought to improve its energy and water use efficiency. Two years later, it undertook a comprehensive $7.5 million energy performance improvement retrofit.

A centerpiece of the plan was the installation of an 800 kW gas-fired generator set installed by Cat® dealer Toromont Power Systems. First commissioned in 1995, the cogeneration system has resulted in substantial energy savings for CCIW over the last 23 years.

In conjunction with other efficiency measures that were undertaken as part of the energy retrofit, energy savings average $950,000 per year. What's more, CCIW has reduced greenhouse gas emissions by an average of 6,700 tonnes per year.

"Being an Environment and Climate Change Canada building, we try to be as efficient as possible by utilizing the heat that comes from our Cat generator," says Rod Khaled, a project manager in the engineering department. "As we are running the cogen and producing power for the facility, we're also heating the building. So we rely on the generator a lot. It's a primary source of heat for us, and it's never down unless it's for scheduled maintenance."

Waste heat from the generator permits the facility's main boiler to shut down for a six-month period during the summer months.

"Six months out of the year we're not running any of our boilers," Khaled says. "So, all of our steam boilers are down, the hot water boilers are down, and the heat derived from our cogen system is enough to keep the building running."

Jacket water heat is recovered from the generator and is used to heat all of CCIW's closed loop systems, including glycol loops that heat the building, and hot water. Heat from the exhaust is used

"Being an Environment and Climate Change Canada building, we try to be as efficient as possible by utilizing the heat that comes from our Cat generator."

ROD KHALED
Project Manager
Canada Centre for Island Waters

to make steam, which supplements the building's heat system.

Approximately 500 kW of electric power from the generator is utilized to power CCIW's internal grid, in concert with another 1,200 kW that comes from the municipal grid.

On occasion, the Cat G3516 genset is also relied upon to power the facility's life safety and critical loads during a power outage from the grid, which occurs periodically due to high winds off the lake. The life safety areas include all of the facility's emergency power systems, exits and fire pumps. The critical areas include freezers and lab equipment.

"Members of our staff have collected samples from the lake dating back to 1972, and they keep them in freezers," Khaled says. "Then they can analyze and compare between now and then and see the differences in the fish or the water or the soil and how things have changed over the years. That's why it's very important to have emergency power for our critical lab equipment, because it's a lot of work that people put in and we don't want to lose it."

180,000 hours, and still going strong

To date, the Cat G3516 gas genset has accumulated 180,000 operating hours, and remains in peak operating condition. Over the life of the generator set, all maintenance has been performed by technicians from Toromont Power Systems. Every six weeks an oil change is done by Toromont based on the manufacturer's recommendations. At that time, the technician also changes the spark plugs.

"We have a good relationship with Toromont," Khaled says. "They're always here on time if we have any sort of issue with our cogeneration system. We definitely rely on them to keep our engine going. I think having a good contract that covers all our maintenance needs is important, and we are very satisfied with the service they provide."

It doesn't hurt that over the last 20 years, the same Toromont technician has serviced CCIW's Cat genset.

"Jasper knows the engine inside out, and we're very happy with him," Khaled says. "Having that relationship and knowing that we can rely on somebody who's so knowledgeable, we feel good about having him here."

CAT® CONNECT

TECHNOLOGY HELPS YOU CONTROL COSTS, IMPROVE PERFORMANCE

With rising costs and pressure to perform, your margins are constantly being squeezed. You need hard facts about your equipment. Cat Connect can tell you how your assets are performing, if they are ready to run, when they need service, and more.

Cat Connect can give you the timely information you need to help manage your operations. Using data from your assets and easy-to-use analysis tools from our dealership, you can make well-informed and timely business decisions that can help you control costs, improve performance and reduce risk.

Control Costs

Using the data generated by your equipment helps you keep your equipment in top shape and avoid unplanned downtime. Cat Connect can help you reduce the lifecycle costs of your equipment in many ways. Here are just a few examples of how technology and data can help control your costs:

- Track all recommended maintenance, service and eliminate unnecessary site visits.
- Utilize your investment properly by running at peak performance.
- Remotely monitor usage to spot training opportunities.
- Eliminate the need for third party monitoring.

Reduce Risk

From managing resources to unplanned downtime, things beyond your control can affect your power units and your performance. Smart technology and equipment data help you deal with uncertainties more effectively. You can use it to:

- Match the right resources, at the right time, with the right capabilities.
- Maximize uptime and extend equipment life.
- Take advantage of equipment data event logs.
- Receive alerts on simple-to-correct conditions.

Improve Performance

When you have the opportunity to analyze performance across your operation, you can determine the most efficient and cost-effective ways to improve. Here are just a few examples of how Cat Connect can help improve your performance:

- Use equipment data to ensure power units are properly loaded and online.
- Use equipment data to monitor run hours and fuel consumed.
- Use electronic inspections, performance data, and alerts to catch potential problems early.
- An overview on your fleet can identify inefficient maintenance practices, and potential technician-development needs.

To learn how Cat Connect can help you build success, contact the power systems experts at our dealership.

READY FOR TAKE OFF

Photo by Metropolitan Knoxville Airport Authority

MCGHEE TYSON AIRPORT IS A STUDY IN EMERGENCY PREPAREDNESS

As plane passengers go through the airport routine of checking baggage, passing through security and waiting for their flights, they're blissfully unaware of the work behind the scenes that provides a safety net around their impending travel. With thousands of flights arriving and departing at McGhee Tyson Airport every year, passenger safety is always top-of-mind for the airport's managers, who know that safety is all in the details.

Continued on page 14

Take the grass that surrounds any given airport—it's not just well-manicured, but meticulously monitored by a wildlife biologist. The goal is to prevent the grass from providing food—either in its seed head or the bugs drawn to it—for birds, said Trevis Gardner, vice president of operations for the Metropolitan Knoxville Airport Authority. Birds, of course, are unwanted around planes as they can be sucked into the engines and cause other problems.

It's little things like keeping the grass cut to a certain height that keep passengers safe, and none of it is taken for granted at an airport. Gardner spends his days preparing the airport for any scenario that could befall it. Periodically, more than 300 emergency responders participate in an emergency preparedness exercise at McGhee Tyson Airport as part of its Airborne Emergency Plan.

Every day, the airport employs 38 public safety officers to not only keep the peace, but also respond to any sort of emergency. These officers are not just law enforcement certified, but are also aircraft rescue firefighters.

"Aircraft rescue firefighting is a completely different science than structural firefighting," Gardner said.

CUSTOMER PROFILE

McGhee Tyson Airport

Location: Knoxville, Tenn.

Application: Standby power

Cat® Equipment: 450 kW C15 Standby Generator Set, 350 kW 3406 Standby Generator and 1100 kW 3512 Standby Generator

MCGHEE TYSON AIRPORT KNOXVILLE

In short, they are trained to mitigate hazards and also evacuate aircraft and rescue passengers should such a situation arise. McGhee Tyson's officers are carefully selected for their expertise—they either have a background in law enforcement or firefighting—and then trained extensively. Officers are on shift for 24 hours and housed on-site so they can be called upon at any time during that period.

In the community

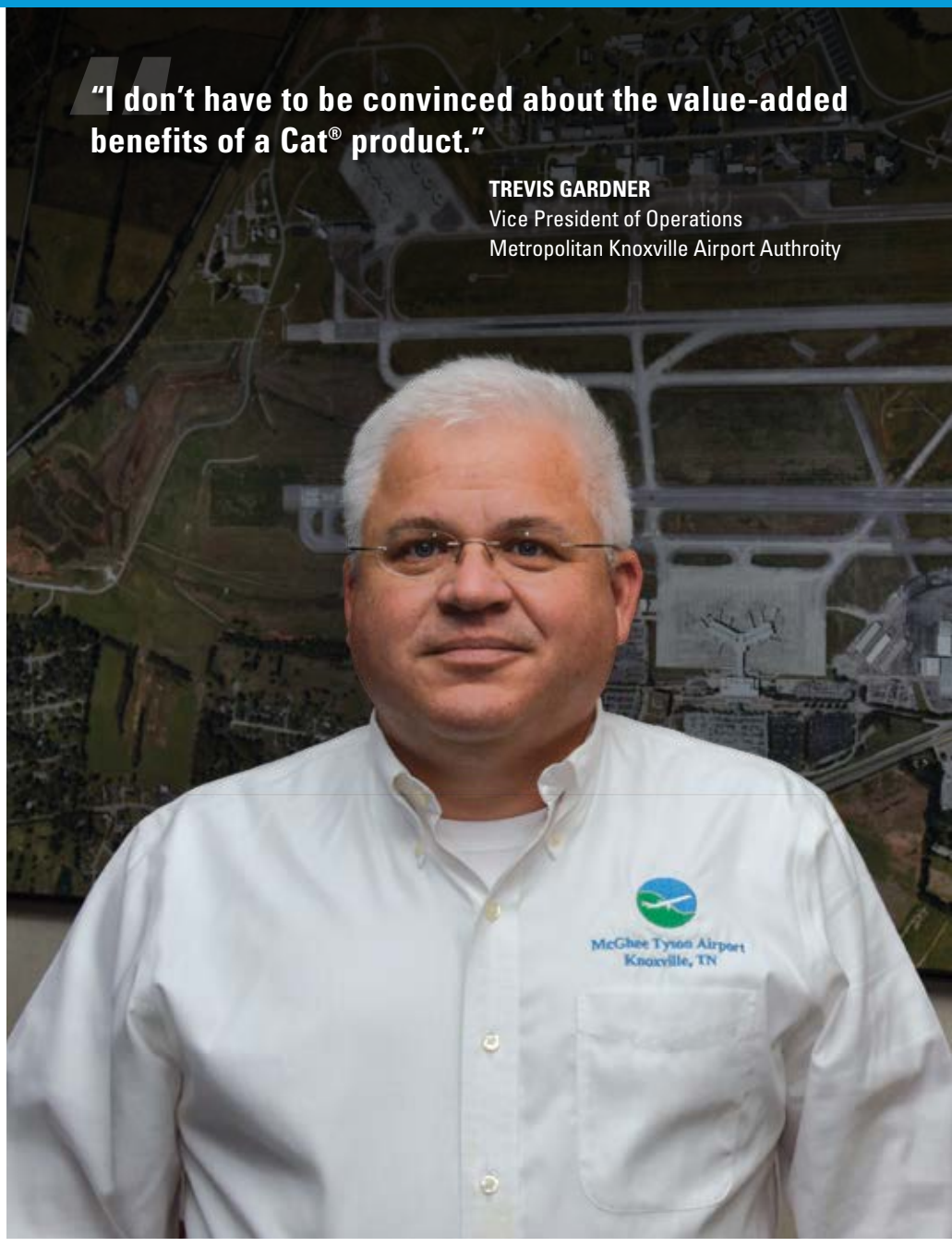
The Airport Authority also works with emergency responders from surrounding communities during preparedness exercises at the airport, though it is more frequently the case that the airport's officers or emergency vehicles assist during crises outside the airport. One such example occurred in 2013, when a burning pile of mulch in Knoxville could not be extinguished through typical means. The airport sent one of its specialized fire trucks that is capable of extinguishing very hot fires and successfully put out the flames.

Much of the airport's infrastructure is driven to support the Tennessee National Air Guard's 134th Air Refueling Wing located there. The Guard rents part of the airport and aviation services, making it a joint-use military facility.

Gardner says that the Metropolitan Knoxville Airport Authority is somewhat akin to a mall owner in that it owns the building and runways, but service providers are responsible for most of what happens at an airport. More than 3,800 people come to work at the airport, but only about 170 of those work for the Airport Authority.

Providing power

Standby power also plays a big role in the airport's emergency preparedness. McGhee Tyson's generators provide standby power for the navigation aids, airfield lighting, air traffic control tower, emergency operation centers and the passenger terminal.



"If commercial power goes off, then passengers can keep boarding," Gardner said, noting that it can cost the airport tens of thousands of dollars per minute when flights are delayed.

As for purchasing several Cat® generators to provide standby power, Gardner said he knew he was getting a great product with long-lasting support.

"I don't have to be convinced about the value-added benefits of a Cat product," he said.

Gardner says he finds even more value from the support he gets from Stowers Power Systems for the Cat generators at the airport. He also appreciates that Wes Stowers, president of Stowers Machinery, is an avid aviator.

"I get all the normal safeguards that you have with the Cat brand, and I know that Wes Stowers and his family have a vested interest in maintaining the operational integrity of McGhee Tyson Airport to continue to serve its customers."

TOROMONT CAT POWER SYSTEMS
268 ORENDA ROAD
BRAMPTON ON L6T 1E9

YOU HAVE THE POWER OF CHOICE

TOROMONT Power Systems CAT

www.toromontpowersystems.com
powersystems@toromont.com

TOROMONT CAT POWER SYSTEMS
THE POWER TO BE PREPARED

- 24/7/365
- Generators 20kW-2000kW
- Load banks
- Transformers
- Distribution equipment
- Transfer switches
- Temperature control equipment

1600 DEALER OUTLETS

Delivers the power you need, when you need it, where you need it. Trust Toromont Rental Power to deliver the equipment, manpower, service and confidence you expect from Cat.

24 HOUR CALL US ON OUR RENTAL HOTLINE
1-866-667-5544

BUILT FOR IT.™

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.