A Cat® Dealer Publication for Power Professionals SUMMER 2025

RUNREADY™

BEHIND the HERD

Cat® power protects livestock health

OFF THE GRID. ON THE MONEY

Hybrid system powers remote facility with clean energy

DUAL-FUEL ENGINE KITS OPTIMIZE DRILLING FLEET

DGB upgrade kits extend longevity of Cat® 3512C engines

A NEW LEASE ON LIFE

H&H Marine repowers U.S. Army Corps of Engineers' towboat

Taking Stock

Standby power can be utilized in many applications, and is available in varied sizes to meet diverse needs. At a cattle feed yard in Dodge City, Kansas, five smaller generator sets back up various parts of the operation, while a larger 3512 generator backs up the feed mill. The cover story details the critical nature of standby power for an operation that supports 36,000 head of feeder cattle.

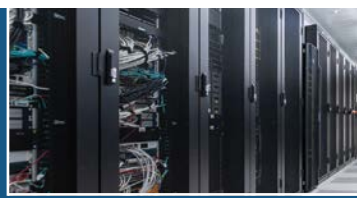
Also in this issue, a microgrid has replaced a diesel generator at the guard gate of Caterpillar's Tucson Proving Ground, which is not connected to the utility grid. The switch is saving a substantial sum on fuel and generator maintenance—not to mention providing a quieter, cleaner working environment for the guards who staff the gate.

In a similar vein, a guest column outlines key considerations for establishing remote power in off-grid locations. Another story about Battery Energy Storage Systems (BESS) sheds light on adding extra energy storage capacity when and where its needed most.

Another story details an interesting alliance between a utility and a manufacturer that operates two facilities in the Canadian province of Ontario. Twelve generators are deployed in a behind-the-meter configuration. During periods of peak grid demand, energy costs are reduced through the deployment of Cat® AMP distributed energy resources (DERs).

Enjoy the summer weather while you read the diverse lineup of stories in this issue of ***RunReady***.

DID YOU KNOW?



ACCELERATED GROWTH IN MICROGRID CAPACITY

At the end of 2023, operational microgrid capacity in the U.S. reached 8.6 gigawatts (GW), expanding at an annual growth rate of 32%, according to a study by Wood Mackenzie, a global provider of data and analytics. The surge was driven by increasing demand for energy resilience, integration of renewable energy sources, and the need for decentralized power solutions.

In 2022, the commercial and industrial sector accounted for 48% of microgrid customers, followed by the governmental sector at 22%, residential at 16%, and education at 13%.

The growth of microgrids is closely linked to advancements in energy storage technologies. In 2023, the U.S. energy storage market added 5,597 megawatt-hours (MWh) in the second quarter alone, setting a new quarterly record. The integration of long-duration energy storage enhances the resilience and efficiency of microgrids, providing for better management of energy supply and demand.

MICROGRID REDUCES GHGS FOR WEST AFRICA TELECOM OPERATOR BY UP TO 80%

Orange Mali, the largest telecommunications operator in West Africa, has completed the demonstration of a hybrid microgrid power system at a mobile tower site in Kéniéba, Mali. The system significantly lowers total cost of ownership, while also reducing associated greenhouse gas emissions by up to 80%.

Engineers for Neemba, the local Cat® dealer, installed and commissioned the solution designed by Caterpillar. It integrates a Cat® C2.2 diesel generator set, solar photovoltaic (PV) panels, and lithium-ion energy storage to supply up to 6 kW of power for the site, previously supported by a diesel generator set.

The system features a modular design that enables the addition of components to increase power output for rising traffic and network upgrades over time.

"Orange Mali is dedicated to building a more responsible digital world by achieving net zero carbon emissions by 2040," said Mahamadou KEITA, project manager for Orange Mali. "The hybrid microgrid system developed by Neemba and Caterpillar exemplifies our collaborations with innovative companies."

Over the past decade, Neemba has supplied Orange Mali with more than a thousand Cat generator sets ranging in size from 15 kVA to 1 MVA. The Cat dealer currently provides maintenance for power solutions at hundreds of telecom towers through extended customer service agreements.

"Neemba has supported the transformation of enterprises in West Africa for nearly a century, and this hybrid microgrid demonstration for Orange Mali shows how we can leverage advanced Cat power solutions and our industry expertise to support our customers through the energy transition," said SANOU Baba Nestor, energy sales manager for Neemba.

"Caterpillar helps customers achieve their climate-related goals by providing products, technologies, and services that deliver energy flexibility, increase efficiency, and reduce emissions.

"The energy transition requires resilient solutions that maintain superior power availability and reliability while reducing associated costs for the customer," said Neil Smith, growth strategy manager for Caterpillar Electric Power. "One size doesn't fit all, and our collaboration with Neemba and Orange Mali proves how we can combine our deep portfolio with our knowledge of the telecommunications sector to help customers excel in every aspect of performance."

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IN THE SPOTLIGHT:

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Southwest Kansas is subject to ice storms, wind surges, tornadoes and straight-line winds. Behind the scenes at the massive Wilroads Feed Yard in Dodge City is a quietly reliable system keeping things moving—even when the lights go out. Power is the lifeblood of the livestock operation. Without it, everything grinds to a halt—and the consequences can be immediate and serious.

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OFF THE GRID. ON THE MONEY

Hybrid system powers remote facility with clean energy

In the sun-drenched Arizona desert, Caterpillar is proving that remote energy systems can be cleaner, more efficient, and drastically cheaper to run.

At its Demonstration and Learning Center and Tucson Proving Ground (TPG), located 40 miles south of Tucson, the company has installed a compact hybrid microgrid at its guard gate that is already delivering dramatic results since it became operational in early February.

The project combines solar panels, a battery storage unit, and an existing diesel generator—transforming how the site is powered.

The guard gate is located several miles up the road from the Demonstration and Learning Center and TPG facilities where conferences are held, and large construction machines are tested and demonstrated for prospective customers. With 330 days of sunshine each year, the Green Valley location is an ideal proving ground.

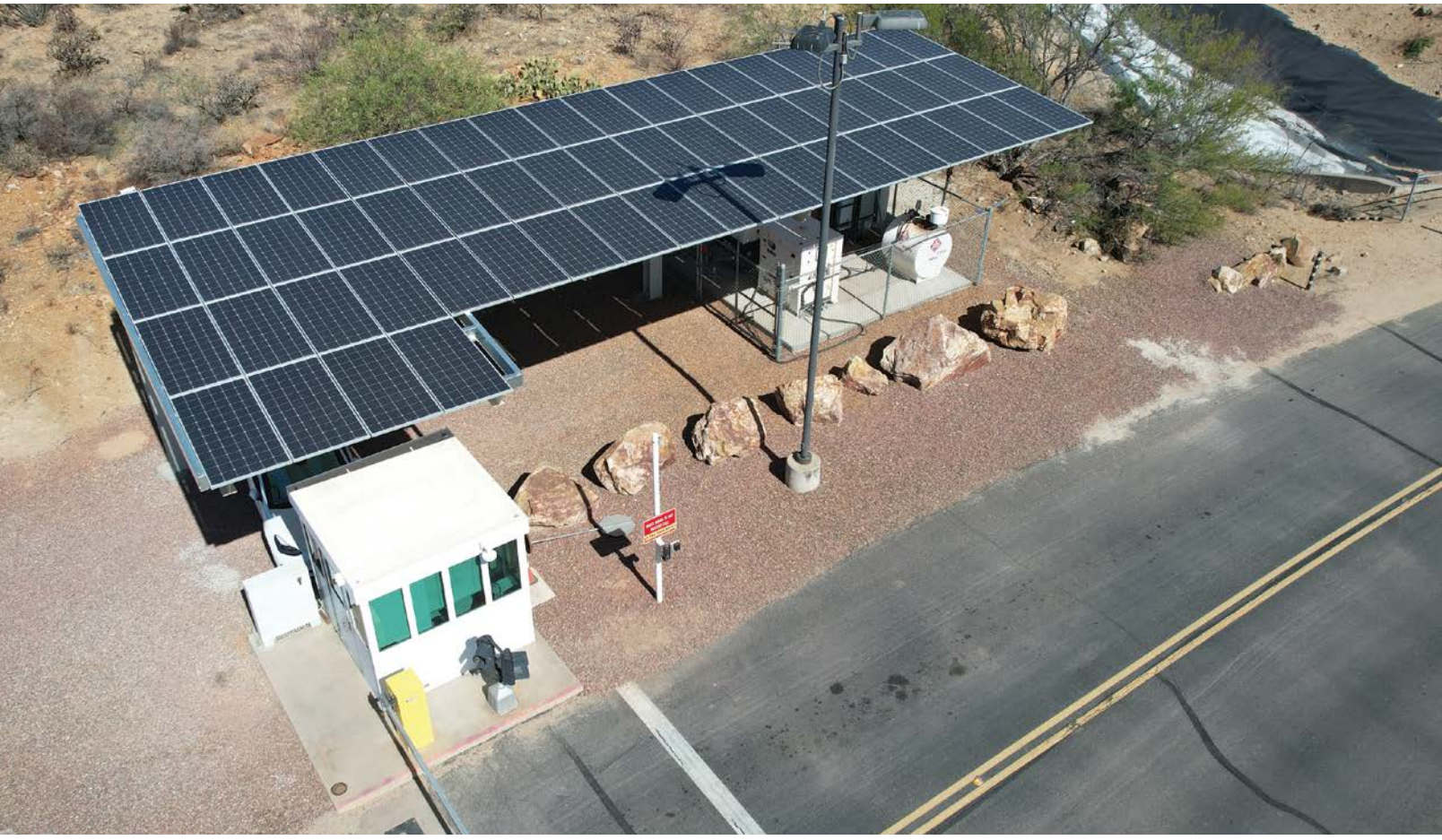
CUSTOMER PROFILE

TUCSON PROVING GROUND (TPG)

Location: Green Valley, Ariz.

Cat® Equipment: XES60 Compact Energy Storage System (ESS), 20 kW Mobile Genset

Cat® Dealer: Empire Southwest



"There's no utility out here. There's nowhere to plug in your electric car or run an air conditioner," says Paul Newman, a microgrid sales and business development manager for Caterpillar Electric Power. "We've been running off-grid for more than 30 years here, but we knew it was time to convert to a cleaner, more renewable solution."

The diesel generator powering the enclosed guard house had logged over 150,000 hours, and was already rebuilt once and due for another overhaul.

"When the A/C was running inside the small guard house, the old generator just guzzled diesel fuel its entire life," says Thomas Schwartz, a project systems engineer for Caterpillar Electric Power. "That generator is probably older than I am. And because it was running so lightly loaded, it had a very bad performance curve in terms of fuel efficiency."

Rather than performing another round of maintenance on the generator, the team opted to install a hybrid microgrid system using Caterpillar's latest technologies.

"The project had been paused for a time, but with the sustainability journey that we're undergoing here at TPG, we brought it back to life," says Jacob Twitchell, a facilities project engineer at TPG. "We wanted to invest in a more renewable energy source and avoid running the generator all the time."

The upgrade includes 58 solar panels mounted on top of a carport-type roof. (The solar canopy also shades the guard house, reducing the cooling load while providing a place to park in the shade.) The centerpiece of the system is the Cat® XES60, a mobile, rental-ready battery unit rated at 25 kVA. It includes a built-in microgrid controller and accepts both DC input from solar panels and AC input through traditional inverters.

"The solar charges the battery, and the battery runs the site, including the guard house, all day and night," Newman explains. "In the first month of operation, the backup generator produced only 50 kilowatt hours (kWh)—20 kWh of which were logged during testing."

Serving as the brains of the system, an accompanying web portal provides constant updates that are delivered via a cellular connection.

"So, we benefit from all of the telemetry associated with the microgrid," Schwartz says. "It tells us what's happening today, or what happened yesterday. It's reporting a lot of data, and you can basically see everything that's going on with the system. And it actually forecasts what the solar output will be the next day."

Major savings

With the previous setup, the diesel generator ran nearly 24/7, often under low load—an inefficient and costly approach.

"Based on the initial results, we're probably saving close to $6,000 a month just in diesel fuel," Newman says. "And that's not even counting the time, labor, and maintenance costs of fueling and servicing the generator."

"With our sustainability journey that we're undergoing here at TPG, we wanted to invest in a more renewable energy source and avoid running the generator all the time."

JACOB TWITCHELL, Facilities Project Engineer
Tucson Proving Ground

The guard house requires power for all communications and Internet connections. It also operates all the signage and gate controls. Beyond fuel savings and dramatically reduced emissions, the new setup provides a more pleasant working environment, says security officer Mike Hjerpe, who staffs the gate.

"I no longer hear a noisy generator running 12 hours a day, and I don't smell the diesel fuel anymore," Hjerpe says. "Now it's nice and peaceful and quiet out here."

Twitchell says the project has proven to be a great value to the facilities staff.

"With the operational success of this project, we're currently evaluating other locations within the property where we can utilize small solar structures and a battery storage unit to eliminate other generators that are providing power here."

The installation was handled by local Cat dealer Empire Southwest, which provided a turnkey solution including engineering and construction.

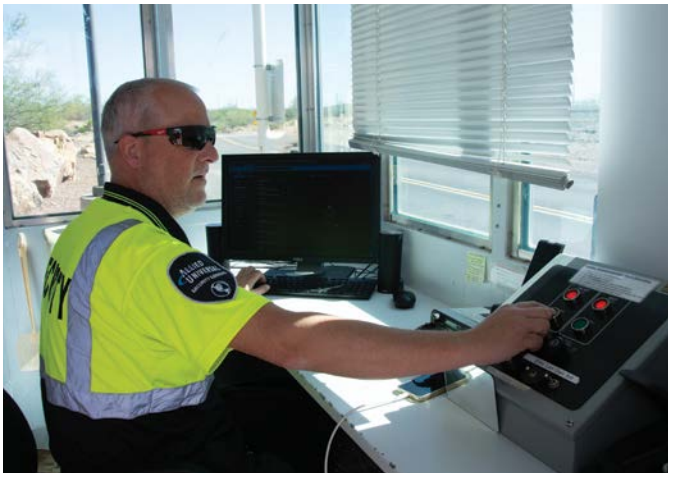
"The generator is still there as a backup, and the microgrid includes a battery, so the generator only has to run if the solar output is not sufficient to charge the battery unit," says Joel Smith, a commercial sales engineer for Empire Renewable Energy. "For the most part, it serves as an autonomous,

Continued on page 6

off-grid system for all the power needed at the guard gate. The generator is there solely as a backup system."

From his vantage point, Smith is starting to see an uptick in microgrid installations.

"We have some off grid-installations that serve water pumping stations, where we have solar PV, Cat generators, and Cat battery storage," he says. "The solar panels are installed on either parking canopies or ground-mount systems. From a renewable standpoint, we've installed up to a 10 MW ground mount and a 4.8 MW rooftop system. We've been doing a lot of carport canopy installations, such as one with 200 spaces at an affordable housing project."



Real-world applications

Newman sees widespread potential for similar setups in off-grid locations such as construction sites, cell towers, remote radio stations, and water wells.

"We're seeing a lot of interest in hybrid microgrids—on-grid or off-grid," he says. "Anywhere customers want to save money on energy, or where power access is limited, this kind of system makes economic and environmental sense."

The hybrid application is well-suited for regions that have a lot of sunshine and poor utility or no utility connection, Schwartz, says.

"The first thing that comes to mind is the islands in the Caribbean, where hurricanes are a constant threat and power from the grid is unreliable," Schwartz says. "In places like Puerto Rico or the Dominican Republic, think about the compromised power grid they face, and then throw in long-term outages from a hurricane. Following a hurricane, they may be without the grid for several months. So this type of installation is an example of how a small mobile device can run when the grid is down.

"We've had inquiries from convenience store/gas station vendors down there," Schwartz adds. "They have a very lightly loaded grid, but what an impact they could have if they were the guys selling gas after a storm rolls through there, because they've got a battery system and some PV (photovoltaic) panels that survived."

It's also applicable for venues that require power without the accompanying noise from a generator set.

"A generator would disturb a music festival, and might potentially disturb customers at a food truck," Schwartz says. "This product is perfect for those applications where ambient noise is unwanted. And you can run clean because there's no exhaust emissions or anything coming from it." RR

CAT® BATTERY ENERGY STORAGE SOLUTIONS

ADD EXTRA POWER CAPACITY WHEN AND WHERE YOU NEED IT MOST

Battery storage, or battery energy storage systems (BESS), are devices that enable energy from renewables, like solar and wind, to be stored and then released when businesses and industries need power most.

By introducing more flexibility into the grid, energy storage can help integrate more solar, wind and distributed energy resources. It can also improve the efficiency of the grid by increasing the capacity of existing generation and transmission resources.

Energy storage can provide backup power during disruptions on the utility grid. Storage can also smooth out the delivery of variable or intermittent resources such as wind and solar, by storing excess energy when the wind is blowing, and the sun is shining, and delivering it when the opposite is happening. It's not uncommon for clouds to block the sun and cut half to as much as 90 percent of the power generated from a solar array, and it does so quickly. Energy storage can be used to fill in those voids, pulling the stored energy from the battery to normalize loads.

How does BESS work?

To store energy, BESS products need to be charged. Multiple power sources can charge BESS, such as renewables (solar/wind), diesel or gas generator sets, and mains power. BESS products can run solely on their own, powering a site with near-silent power.

In more common applications, BESS is used in conjunction with a generator set and/or renewables. BESS can help maintain engine health, preventing the generator set from running on a non-optimal load.

Dispatching BESS

When it's time to call upon your energy storage, whether it's to discharge your energy quickly for grid stability or a slower transition from renewable sources to battery, your BESS product can either manually or automatically dispatch power.

You can even monitor energy market conditions and avoid energy peak charges. All of this is made possible with Distributed Energy Resource Management (DERM) software, Cat AMP. Watch the Cat AMP demo to see how your Cat dealer can help you.

Covering the cost

When it comes to installing a new energy solution, cost is naturally top of mind. There are many ways to pay for your BESS solution. Here are some of your main options:

An EaaS Package: Opting for this removes the risk of owning or maintaining the power assets, alongside upfront costs. To learn more, visit the EaaS page (cat.com/en_US/by-industry/electric-power/electric-power-industries/energy-as-a-service).

Finance Options: Cat Financial can help you finance your energy solution enabling you to pay for it over time, reducing upfront capital costs.

Rent Before You Buy: Often the best way to prove your cost and resiliency theories is to pilot the solution without the commitment of buying it. Installing a temporary power solution will help you prove the benefits of your new solution.

To learn more, contact the power systems experts at our dealership.

REMOTE POWER

Key steps for establishing reliable off-grid power >>>

By Denzil Cotera, Business Development Manager, Cat® Electric Power

From mining to oil and gas to infrastructure development, every remote project relies on one essential factor: Power. It's essential for establishing an isolated site off the grid.

In my work helping operations set up remote power, I've identified a few key factors that make the difference between success and setback. Once you have evaluated your power demands—baseload, peak loads and load fluctuations for your remote project—here's how to lock in an efficient, reliable power solution for your remote project.

Diesel could be your best option

If you can't access a utility grid or pipeline gas, diesel is usually your lowest-cost fuel source.

It's easy to transport: Diesel fuel can be transported to remote areas safely and easily by land, sea or air if necessary.

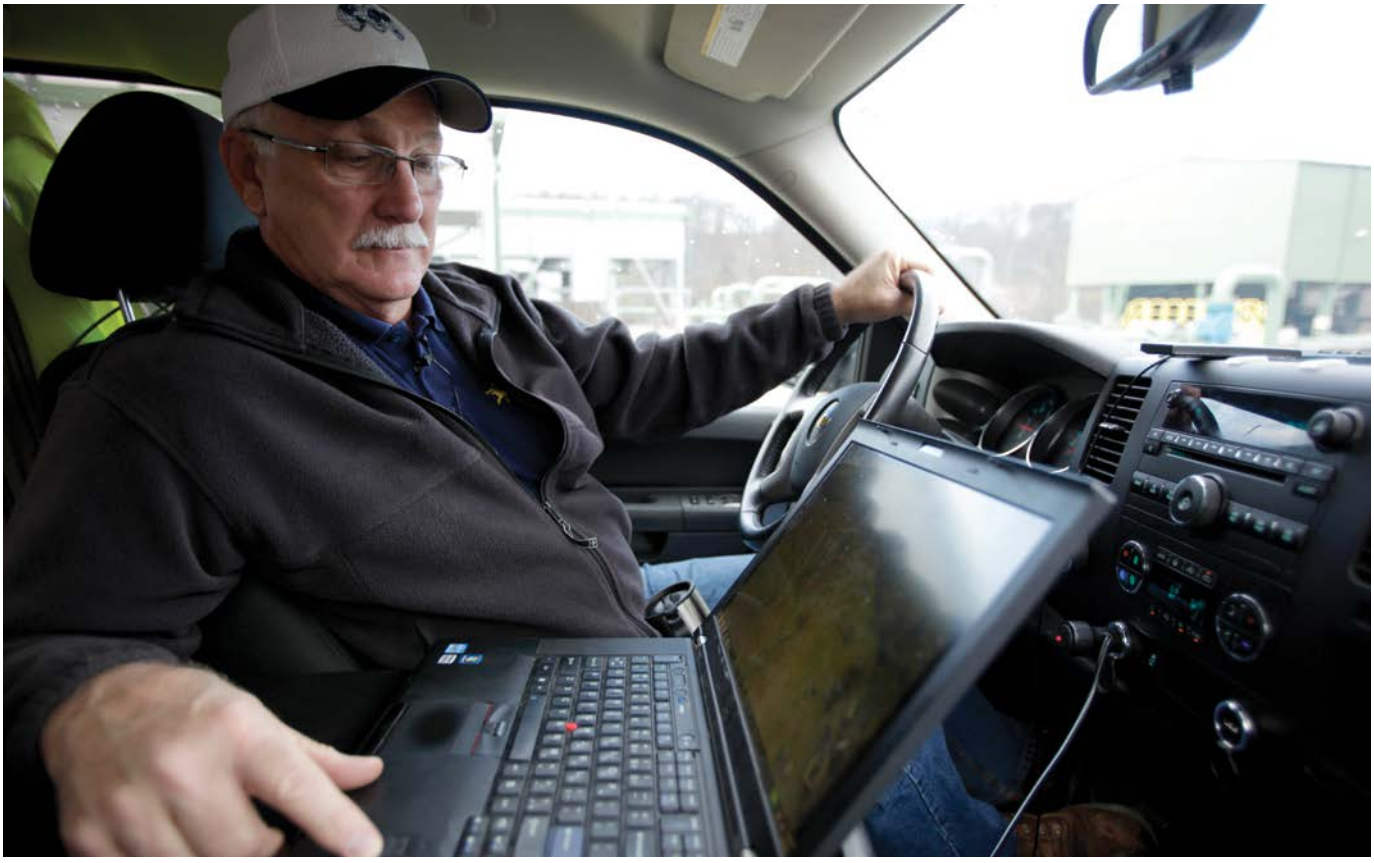
It's power dense: You typically need less diesel than other fuels to generate the same amount of power, which reduces both costs and storage requirements.

It's reliable even in extreme conditions: Diesel-powered gensets are known for their reliability, durability and fuel-efficient performance even in harsh, remote environments, including extreme temperatures and high altitudes.

Include A Backup Plan

Many remote sites rely on an "N+1" setup — basically adding one more generator than what's required for full capacity. Why? So, you always have a spare available in case of planned or unplanned downtime.

Without building in redundancy at your site, you're gambling with potential blackouts or power shortages. In remote locations, when a unit goes down, you need to establish a backup plan.



Remote monitoring = peace of mind

Early intervention is critical in remote locations, where it can take days or even weeks for expert service technicians to arrive. Think of remote asset monitoring as an extra set of eyes on your assets 24/7. You can log in from anywhere on your desktop or mobile device, access real-time data and confirm that your asset is running as expected.

More importantly, today's remote monitoring technology includes condition monitoring capabilities. It can analyze data from your assets, identify trends and alert you to potential issues before they turn into expensive breakdowns. With condition monitoring, you can identify the root cause, order the right parts and plan for service proactively—all of which cost less in time, money and hassle than after-failure repairs.

Select a power supplier with remote challenges in mind

Your power supplier's job shouldn't end with the equipment sale. In fact, that's just the beginning. Ongoing maintenance, parts and service support are crucial to the smooth running of any off-grid site. If you're setting up a remote project, you should seek a company that has:

- **A solid performance history with remote projects.** Seek out a supplier who understands the logistics and challenges associated with providing and supporting off-grid power. That includes working with you to find solutions that meet local emissions requirements.
- **A strong service network.** You need access to parts and experienced technicians, no matter how remote your site. Can your supplier quickly dispatch what you need, when you need it? Will the supplier work with you to expedite deliveries or supply an inventory of critical parts you can keep on hand for emergencies?
- **A flexible approach.** Every off-grid site is different, so don't settle for one-size-fits-all support. You might need dedicated onsite technicians. You may benefit from a service agreement with locked-in parts and labor pricing.

Your supplier should be willing to listen to your needs and work with you to tailor a support solution that keeps your power plant running efficiently.

Expert support for off-grid success

In remote locations, power isn't just another box to check. It's the backbone of your entire operation. Caterpillar and Cat dealers will help you get it right. We've worked with dozens of operations across industries to select, install and support off-grid power solutions, and our team is ready to help you secure reliable power for your remote project.

If you have questions about potential energy sources, regulatory issues, environmental factors or serviceability, contact the power systems experts at our dealership.

COST CUTTER

CAT® DERMS HELPS MANUFACTURER OPTIMIZE ENERGY USAGE

As the largest municipally-owned electric utility in Canada, Alectra Energy Solutions serves more than one million homes and businesses and 17 communities in Ontario's Greater Golden Horseshoe area.

It's commitment to innovation and understanding of the changing energy sector enables the utility to provide the products and services that will help customers meet the energy challenges of tomorrow.

Under a 15-year power purchase agreement (PPA), Alectra recently deployed 12 Cat® G3500 series natural gas generator sets to provide behind-the-meter power production for diversified manufacturing facilities in Guelph and Windsor, Ontario that are operated by Linamar Corporation.

During periods of peak grid demand, energy costs are reduced through the deployment of distributed energy resources (DERs).

The turnkey power systems are dispatched through Caterpillar's distributed energy resource management system (DERMS) software solutions to reduce Linamar's energy costs.

DERMS software solutions from Caterpillar can help customers monitor, manage, and monetize on-site energy assets. The Cat Active Management Platform (AMP) monitors usage patterns from the grid and client facilities, analyzes opportunities in energy markets, and then dispatches DERs to maximize results without disrupting normal business operations.

Headquartered in Guelph, Linamar is Canada's second-largest automobile parts manufacturer. Linamar's extensive manufacturing capabilities include precision metallic powertrain systems, advanced aerial work platforms and durable industrial and agricultural assemblies.

With more than 33,000 employees in 75 manufacturing locations, global operations are divided into regional groups with vertically integrated operations combining expertise in light metal casting, forging, metal forming, machining and assembly, for both the global electrified and traditionally powered vehicle markets.

The fully integrated power solution supports Linamar's goal of operational excellence and energy efficiency, while reflecting the company's commitment to sustainability.

"These capabilities from Caterpillar and Alectra support our long-term sustainable business model through an innovative and efficient energy solution that reduces our operational costs and enhances our position in a highly competitive industry," said Jim Jarrell, CEO & President of Linamar Corporation.

"Alectra Energy Solutions is committed to being a trusted advisor and long-term energy partner for our customers," said Ammar Nawaz, Vice President of Distributed Energy Solutions for Alectra. "This solution supports Linamar's balanced approach to business growth by stabilizing long-term energy costs and enhancing resiliency amid rising power prices."

The project included construction financing facilitated by Cat Financial, while local dealer Toromont Power Systems completed the engineering, procurement, and construction.

To learn more about how DERMS can help your business optimize your energy usage, contact the power systems experts at our dealership.

Cleveland Brothers CAT

www.clevelandbrothers.com

ELECTRIC POWER PRODUCT SUPPORT

When you purchase a Cat® generator set, it's the start of a lasting partnership. That's why having the right partner makes the difference. Cat services extend the life of your generator sets, increase original generator set performance, and are designed to reduce your owning and operating costs.

Caterpillar and our dealership are dedicated to making sure you get the most from your equipment with outstanding service and support. Supplement your capabilities with these services.

Customer Value Agreement (CVA)

A CVA is a service and maintenance agreement between you and your Cat dealer featuring individualized solutions for your power system, such as parts, services, and digital enablers. Our CVAs range from convenient planned maintenance to total cost performance guarantees. No matter which service option you choose, you can expect Caterpillar and our dealership to keep your power system running. CVA customers develop a relationship with their Cat dealers to optimize their generators and operations. Partner with a team that keeps your costs down and your power up with customized options. Modify your CVA service contract at any time.

With Cat® Connect, you're in control

Connect your electric power assets using hardware, data streaming technology, and digital tools that enable you to monitor and manage your generator performance, costs, and operational efficiencies. Gain even more value with help from Cat dealer experts who can monitor your generators in real time. Minimize downtime, reduce costs, and have peace of mind that your generator sets will run when they are needed.

Three components are necessary to deliver the benefits of connection:

Hardware: Multiple hardware options are available to send and receive data to and from the remote user interface. Selection depends on application and other factors.

Cat Remote Asset Monitoring (RAM) Technology: Cat RAM is Cat Connect's interface technology. Use Cat RAM to leverage real-time access to performance and health data, identify issues early, accelerate troubleshooting, and work remotely with site managers to resolve problems before failure.

Cat RAM Subscriptions: Data streaming subscriptions, protected by strong cybersecurity technologies and practices, alert the dealer and the customer regarding the need for parts and service.

Caterpillar Warranty

You count on your Cat electric power equipment to get the job done. Your Caterpillar warranty protects your investment so you can focus on running your organization.

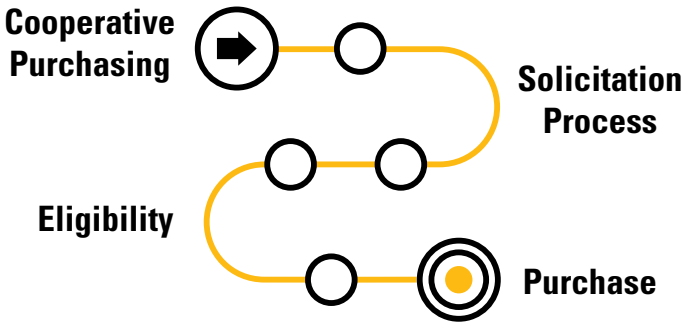
Extended Protection

Get total peace of mind with unrivalled support that goes beyond your warranty. With Extended Service Coverage options for a variety of applications, we've got you covered through the life of your equipment.

To learn more about these value-added services, contact the power systems experts at our dealership.

BUY CAT® ELECTRIC POWER SOLUTIONS FROM SOURCEWELL

CATERPILLAR®



- **Cooperative Purchasing:**
  Enables agencies to access pre-negotiated contracts, streamlining procurement and achieving cost savings through group buying power
- **Solicitation Process:**
  Sourcewell's solicitation process involved public RFPs, ensuring competitive pricing and compliance, then awarding contracts accessible to member organizations nationwide.
- **Eligibility:**
  Available to all government, education and non profit entities.
- **Purchasing:**
  Scan to register with Source**well**, find contract and contact Cat dealer.

EP PRODUCTS

Register to view more inventory

Cat® GC18 DG500

Cat® C2.2 Diesel

Cat® C32

Cat® C7.1 Diesel

WHAT IS IT?

- Offers solutions to completely solicited contracts for government, education, and nonprofits
- Assists in meeting specific needs which are more efficiently delivered cooperatively than by an entity individually

TOP VENDOR

- Caterpillar is the #1 vendor on Sourcewell
- Contract #092222-Caterpillar provides access to all electric power generation equipment

#092222-CAT

OUR DEFINITION OF WINNING

- **Reliable:**
  Trusted process, satisfy bidding steps, high quality Cat products
- **Quick:**
  No-cost registration, completes steps for you, finds the best bid
- **Informative:**
  Control cost, manage risk, full catalogs, buying power of 50,000 agencies, volume discounts

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CAT® CVA GENERATOR SERVICE CONTRACT

Industry studies show that nearly 90% of the time, generator failures could have been prevented—and that's money out of your pocket.

Protect your generator set investment and peace of mind with a service contract designed to ensure your power equipment performs. With a Cat® Customer Value Agreement (CVA), you get a tailored generator service agreement between you and our dealership for a hassle-free ownership experience.

You benefit from individualized solutions for your power system, such as parts, services, and digital enablers. Our CVAs range from convenient planned maintenance to total cost performance guarantees.

CVA customers develop a relationship with their Cat dealer to optimize their generators and operations. Partner with a team that keeps your costs down and your power up with customized options. Modify your CVA service contract at any time.

Coverage without interruption-Extended Service Coverage

- Protect your investment with coverage for parts and labor expense on covered components.
- Avoid unexpected repair costs caused by unscheduled repairs.
- Budget for unexpected repairs and lock in costs up front.
- Ensure repairs are done right the first time, with factory-trained technicians using genuine Cat parts.
- Return your electric power systems to their original operating specifications, meeting all requirements for safe use and environmental compliance.
- Combine extended service coverage (ESC) with a Customer Value Agreement for complete maintenance and repair protection.

A variety of coverage options

New ESC: Coverage for electric power prime generator sets is available in 24- to 60-month terms (24- to 120-month terms for standby generator sets and automatic transfer switches), if purchased before the end of your factory warranty.

Advantage ESC: Coverage is available in 12- to 60-month terms after the end of the factory warranty period and before the first overhaul. Coverage can be extended up to 25 years from delivery date for standby generator sets, and up to 10 years for prime.

Overhaul ESC: Coverage is available in 12- to 60-month terms after a qualifying overhaul has been completed by an authorized Cat dealer in accordance with the Overhaul ESC Checklist.

Get more out of your power system by minimizing downtime and extending the life of your generator with our preventative maintenance contract.

Contact out dealership to learn more about coverage level flexibility, allowances and long-term options, or go to: cat.com/epsupport.

POWER, AIR, & TEMPERATURE CONTROL

WHEN YOU NEED MORE THAN A GENERATOR

From disaster relief to scheduled power system maintenance, often customers need advice, recommendations, and, in some cases, additional products such as:

- Battery Energy Storage
- Air Compressors
- HVAC units (Temperature Control)

To keep operations running smoothly, our trained experts and extensive dealer network are ready to create a power design that can be fully optimized for your application.

Battery Energy Storage System

Combine traditional mobile rental power with a new mobile battery energy storage system equipped to provide uninterrupted power for a wide range of applications.

Air Compressors

Air compressors are often referred to as the "fourth utility," joining electricity, natural gas and water as an essential service in most industrial and commercial facilities.

Temperature Control

Air conditioning, humidity control, heating, and air handling systems are just some of the vital requirements needed for residential, commercial, industrial and governmental facilities.

Expert Guidance & Support

From fast installation and easy setup to site survey quality, the power systems specialists at our dealership are standing by to ensure your rental solutions are effective and save you time.

To learn more, contact the power systems experts at our dealership.

Cleveland Brothers CAT

www.clevelandbrothers.com

NEW ENERGY CONTROL SYSTEMS

ECS 300 & 400 HELP SCALE ENERGY SOLUTIONS

Two new Cat® Energy Control System (ECS) solutions, the ECS 300 and ECS 400, provide advanced benefits that seamlessly integrate with sites using singular or multiple power generation assets such as generator sets, battery storage, and renewable sources.

Designed to deliver reliable power and enhance energy efficiency, these solutions enable customers to optimize energy management and achieve cost savings.

The ECS 300 features mains/utility paralleling, enabling customers to monitor and control up to four power generation assets concurrently, with or without the utility. This capability provides the flexibility to utilize on-site power generation assets more effectively, such as during hours of high energy consumption.

Additionally, the ECS 300 provides closed transition with soft load/unload, or open transition with mains/utility operation for emergency standby, providing reliable backup power in the event of a grid failure.

The ECS 400 is engineered for advanced microgrid solutions, with the capability to monitor and control up to 32 power generation assets. This system not only enables customers to expand their existing sites by managing additional power generation assets, but also helps maximize the use of renewable energy sources, leading to reduced fuel consumption and lower overall energy costs.

Extensive and integrated solutions

The expansion of the Cat ECS portfolio underscores Caterpillar's commitment to delivering comprehensive, customer-focused solutions that encompass equipment, controls, technology, and local support. This holistic approach includes power generation assets, remote-monitoring technology, distributed energy storage management systems (DERMS), switchgear, controls, and local expertise, all focused on helping you secure reliable and affordable power.

"As the energy landscape evolves and energy needs become more complex, customers are developing plans to secure power for both the near-term and the future" said Melissa Busen, senior vice president for Caterpillar's Electric Power Division. "The Cat ECS portfolio helps customers scale and future-proof their sites, as these control systems are designed to adapt and grow in support of their future needs."

Expanding Cat ECS range

The new controllers join two existing ECS solutions, the ECS 100 and ECS 200, already on the market. The Cat ECS 100 delivers a valuable control system for new standby, fast-response and prime power generator sets.

All controllers are now available at Cat dealers worldwide with retrofit kit options for the ECS 100 and ECS 200. Caterpillar also offers services for control customization, including system design and hardware and software configuration, providing solutions for site-specific needs.

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

BEHIND the HERD

Cat® power protects livestock health

Nestled in the cattle-dense heartland of southwest Kansas, operations like Wilroads Feed Yard aren't just a part of the local economy—they're the primary economic engine that makes everything else possible.

Just a few miles outside of Dodge City—the legendary Old West town in southwest Kansas made famous by the exploits of lawman and gambler Wyatt Earp—Wilroads operates a vast facility dedicated to feeding and finishing cattle for major beef processors like Tyson, Cargill, JBS, and National.

Wilroads Feed Yard has been a staple of the region since its establishment in 1962, originally holding just 4,000 to 5,000 head of cattle. Over the decades, ownership changed hands and the operation expanded. Today, under the leadership of Keith and Tessa Bowman, and with day-to-day management by Travis McGuire, the yard currently supports 36,000 head—and that number is growing.

"We're in the process of expanding up to 46,000," McGuire says. "We take cattle that weigh anywhere from 500 to 750 pounds and finish them to about 1,400 to 1,600 pounds before sending them to harvest."

Working at Wilroads for 15 years. McGuire has overseen much of this transformation. It's a huge, complex operation, involving the import of corn, precision steam flaking for feed preparation, and water systems that keep tens of thousands of animals hydrated. It's a 24/7 enterprise that doesn't have the luxury of waiting for the local utility to restore power following an outrage.

CUSTOMER PROFILE

WILROADS FEED YARD

Location: Dodge City, Kansas

Cat® Equipment:
Gas gensets: DG125 (3), DG150;
Diesel gensets: D150GC, 3512C

Cat Dealer: Foley Power Solutions

Reliable backup power

Behind the scenes of this massive operation is a quietly reliable system keeping things moving—even when the lights go out. Power is the lifeblood of the operation. Without

it, everything grinds to a halt—and the consequences are immediate and serious.

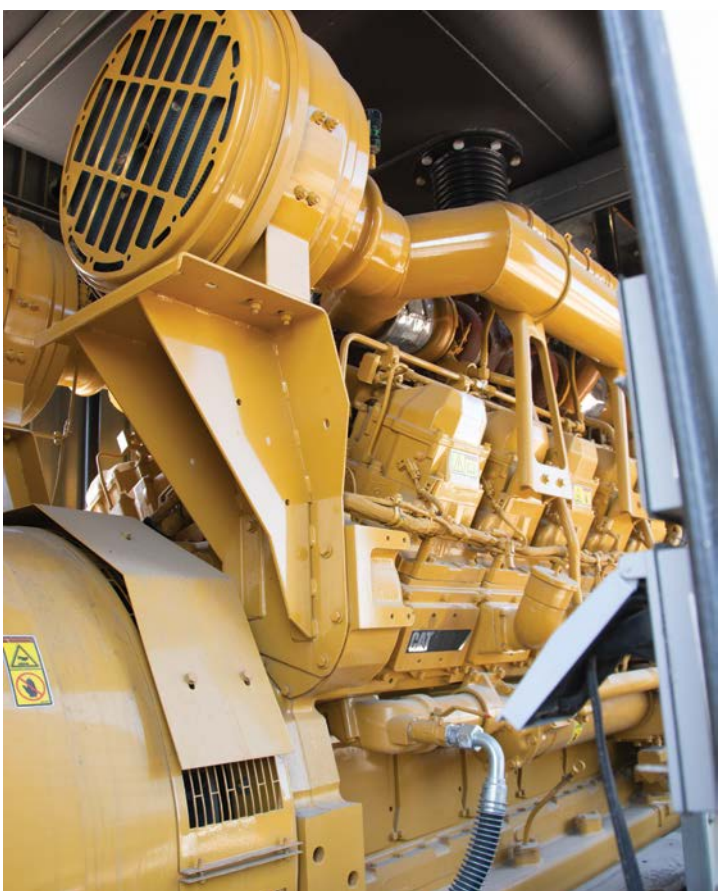
"In southwest Kansas, it's very desolate, and we're at the mercy of the weather—ice storms, wind surges, tornadoes and straight-line winds," McGuire says. "Without power, we can't deliver water, we can't run the mill, we can't feed the cattle. It impacts everything from our office operations to our doctoring pens."

That's where Cat® standby generator sets come in—including a D150 GC model housed in a well facility. Installed with the help of Foley Power Solutions and specified by contractor Max Jantz Excavating (MJE), the generator acts as an insurance policy for one of the yard's most critical water wells.

Altogether, Wilroads has six Cat generators serving in various capacities. Four are fueled by natural gas, while the D150 GC unit runs on diesel fuel.

"The D150 GC backs up this well, which provides water throughout the yard—not just for drinking but also

Continued on page 14



> **"We like to be able to see them tested with a load, it's nice to know they run, but more important to know they'll run under pressure. We do the basic checks—make sure nothing's leaking—but we leave the serious stuff to Foley. That's why we have a service agreement with them."**
>
> **TRAVIS McGUIRE,** Manager
> Wilroads Feed Yard

for irrigation to grow the feed," explains Cliff Gamblin, a territory sales manager with Foley Power Solutions. "Its main function is to make sure we can continue to water the feed yard and keep the cattle comfortable during power outages."

D150 GC Generator

While smaller in size, the D150 GC is a robust, reliable solution tailored for industrial-scale needs like those of Wilroads. It's part of Caterpillar's GC series, designed to provide solid performance with user-friendly operation and reduced installation costs.

"This diesel GC unit will accept 100 percent block load in one step, based on the voltage and frequency dips allowed," Gamblin says. "It will operate in ambient temperatures up to 131 degrees, which is essential with the weather that we experience during southwest Kansas summers."

One of the standout features is the unit's GCCP 1.2 control module.

"It's very user-friendly," Gamblin says. "It's got a simple start/stop/auto function and integrates directly with the transfer switch. So the generator starts and stops automatically based on utility availability."

This reliability isn't just theory—it's verified before the generator even leaves the factory.

"Every generator is tested at the Caterpillar facility to ensure it meets performance standards," Gamblin adds. "By the time it's installed, we already know it's ready to work."

The six Cat standby generators positioned across the facility support different critical systems—from the feed mill to processing barns and water pumps.

The decision to include the diesel-powered D150 GC was intentional, providing a layer of redundancy in a network that had previously relied on natural gas-powered units. (The 3512C diesel generator backs up power to the feed mill.)

"The other generators on site are natural gas for easier maintenance and fuel supply," Gamblin says. "But we wanted to bring in a diesel option to provide redundancy. If the gas service ever goes down, we can use this diesel unit to keep things running."

That forward-thinking approach is essential for an operation of this scale.

"Every square foot of a project is valuable," Gamblin notes, referring to the smaller footprint of the GC generator. "We wanted to make sure we're maximizing space while still delivering performance."

Reliable dealer support

At the core of Wilroads' successful deployment of backup power is its long-standing relationship with Foley Power Solutions—and specifically with Gamblin.

"Cliff and I know each other outside of work," McGuire says, reflecting the close-knit fabric of a town with 27,000-plus inhabitants. "He's always served us well. He sold me the first generator we installed. He works well with our electrical contractor, WesKan Electric, and he always answers the phone—or finds someone who can."

That sentiment is echoed by Aaron Jantz, CEO of MJE, the general contractor handling Wilroads' latest expansion, which will grow the head count from 36,000 to 46,000 cattle.

"We've worked with Foley for years—on equipment, rentals, and now backup power," Jantz says. "Cliff has been essential in helping us size generators appropriately. We'll say, 'Here's what we're building,' and Cliff comes back with exactly what's needed for power. We rely on that."

In a previous expansion at Wilroads, MJE's turnkey design and construction experience resulted in the creation of a state-of-the-art processing and monitoring facility. After consulting with livestock experts, the project incorporated features that better protect cattle and cowboys alike. According to Jantz, the decision to use Foley to install and maintain backup power was easy.

"We chose them because of the service," he says. "We know the product is top-notch, but if anything ever goes wrong, Foley has our back and will be here fast."

Gamblin echoes that commitment: "Our dealership is just two miles down the road, so we have service techs who can come out quickly. Between Caterpillar's extensive parts support and that of our dealership, we can have equipment operational within 24 hours—and usually much less—98 percent of the time."

Keeping It ready

Backup power is only useful if it's ready when you need it, which is why Wilroads takes generator maintenance seriously. Each unit is tested monthly under load for about 30 minutes, and Foley technicians perform annual inspections, checking fluids and running diagnostic tests.

"We like to be able to see them tested with a load," McGuire says. "It's nice to know they run, but more important to know they'll run under pressure. We do the basic checks—make sure nothing's leaking—but we leave the serious stuff to Foley. That's why we have a service agreement with them."

Ultimately, the stakes are high at Wilroads. Every delay in feed or water impacts cattle health, performance, and ultimately, profitability.

"This region couldn't survive without the cattle industry," Jantz says. "There are more cattle than people here, and operations like Wilroads are the backbone of the local economy."

The reliability of power—both from the grid and from standby solutions like the GC generator—ensures that this engine of economic growth never stalls.

As Wilroads Feed Yard marches toward its 46,000-head goal, it does so with the quiet confidence that comes from experience, preparation, and dependable partnerships. The Cat generators may not be the most prominent machines on the yard, but they're some of the most vital.

"With Foley and Cliff, we know we're in good hands," McGuire says. "They've been with us for the long haul, and we trust them to keep things running—no matter what."

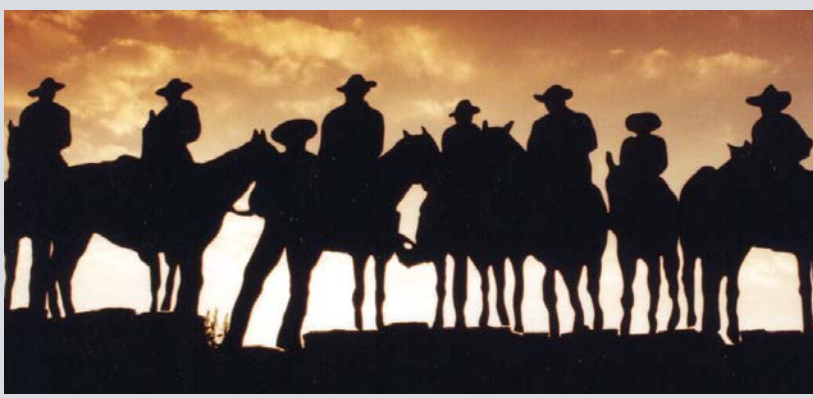
In a business where every minute of downtime costs thousands, and every day is a high-stakes race to feed America, Wilroads Feed Yard isn't just feeding cattle—it's feeding progress, powered by planning, partnership, and a fleet of hardworking, dependable Cat generators.

DODGE CITY: A Colorful Past

In the wind-swept heart of the Kansas plains sits Dodge City — a name that once made cowboys and outlaws alike tip their hats or check their holsters. In the late 1800s, Dodge City was the end of the trail for longhorns driven up from Texas; a raucous railhead where dust, whiskey, and gun smoke mingled beneath gas lamps.

Back then, herds poured through town by the thousands, feeding the growing nation and fueling fortunes overnight. Keeping order in this cattle-soaked chaos was no small feat, but men like Wyatt Earp tried anyway. Earp, a young lawman and quick-tempered gambler, wore his badge alongside a deck of cards—ready to settle a dispute at the saloon table or in the dusty street outside.

Legends say Earp's calm stare and steady Colt .45 helped tame Dodge City, though the stories stretch as wide as the prairie itself. Even today, visitors can stroll Front Street and feel the echo of spurs and laughter drifting from the old saloons.



Located on Wyatt Earp Boulevard in the city center is the Boot Hill Museum—a living tribute to Dodge's wild and lawless heyday. There, the Old West flickers back to life: a glimpse of painted ladies, lawmen's badges, and wooden coffins for those who didn't play their cards right.

Modern-day Dodge City hums quietly now, but under the prairie wind, you can almost hear the cattle bawling and the distant bark of Wyatt Earp telling troublemakers to get out of town—or else.

DUAL-FUEL ENGINE KITS OPTIMIZE DRILLING FLEETS

DGB upgrade kits extend longevity of Cat® 3512C engines

Helmerich & Payne, Inc. is an American petroleum contract drilling company engaged in oil and gas well drilling and related services for exploration and production companies headquartered in Tulsa, Oklahoma, with operations throughout the world. Their FlexRigs, introduced in 1998, have been used extensively in drilling unconventional shale formations, such as the Bakken formation in North Dakota and the Permian Basin and Eagle Ford formation in Texas.

H&P is the largest on-shore driller in the United States with over 20% of the American land drilling market share and over 40% of the super-spec American land drilling market share.

For more than a century, Helmerich & Payne (H&P) has streamlined its drilling technologies and processes to deliver better outcomes for onshore operators in the Lower 48. It strives to be a force multiplier of advanced drilling technologies that drive greater efficiency as the oil and gas industry evolves, and operators work to reduce greenhouse gas (GHG) emissions.

To futureproof its rig engines with lower-emissions technology, H&P engaged Caterpillar Oil & Gas to perform a major overhaul across its fleet. The company upgraded selected rigs with the Cat® Dynamic Gas Blending™ (DGB) Gen 2 Kit technology to capitalize on the latest generation of performance features, while extending the longevity of driller's existing Cat 3512C engines.

The DGB Gen 2 upgrade provides important fuel flexibility, delivering a high diesel displacement rate. This enables H&P to operate rigs with field gas or even compressed natural gas (CNG) to minimize diesel use, resulting in lower operating costs.

CUSTOMER PROFILE

HELMERICH & PAYNE, INC.

Location: Tulsa, OK

Application: Drilling

Cat® Equipment: 3512C engines, DBG Gen 2 Kits

Balancing rising diesel costs with reduced consumption—and utilizing natural gas as an alternative fuel source—the Cat DGB Gen 2 Kit has been a valuable technology for H&P, improving performance with innovative port-injected technology to transform efficiency on site.

As drillers enter the engine overhaul cycle, they can benefit from optimizing their current fleets with a cost-effective

and efficient upgrade solution that offers fuel-flexible advantages—without the added costs of investing in new engines. As H&P replaces a significant portion of its modern fleet with DGB engines, the driller saw value in upgrading to the latest DGB Gen 2 kits to leverage Caterpillar's innovative port-injected technology for improved thermal efficiency and higher diesel displacement.

"Adding the DGB Gen 2 Kits was a positive disruptor for our drilling operations," said Sonny Auld, Product Manager at H&P. "This streamlined technology has enabled us to upgrade our existing rig engines during overhaul, saving us millions by reducing capital and operational costs, while also lowering diesel consumption to support our GHG emissions-reduction goals."

DGB Gen 2 Kit drives efficiency

H&P upgraded selected rig engines to the DGB Gen 2 Kit to optimize performance at its Eagle Ford operations, where the fleet was subjected to hot, ambient temperatures in an extreme heat season during a 15-day trial. H&P evaluated the DGB Gen 2 upgraded engines' impact on costs and efficiency, and noted that the dual-fuel capabilities helped reduce fuel consumption while increasing rig uptime.

The driller observed that operating rigs with a diesel and natural gas combination positively impacts fuel efficiency, while port injection capabilities enable real-time performance optimization. With precise air/gas ratio control at the individual cylinder level, H&P experienced faster response times and reduced unburned gas.

During the 15-day job, positive results were witnessed as CNG powered one engine while a second engine used field gas. With the DGB Gen 2, H&P achieved an average diesel displacement rate of 65% and saved more than 69,000 gallons of diesel on just one rig. The driller then leveraged Cat Smart Engine Management System (EMS) data to further enhance efficiency by reducing engine runtime to conserve fuel and limit engine wear, as well as lower diesel consumption. Collectively, these positive outcomes helped H&P decrease the number of days on-site and the cost per well.

"By reducing fuel consumption and costs and lowering overall emissions with diesel displacement, the DGB Gen 2 dual-fuel technology enables us to deliver operational excellence in both drilling performance and productivity, effectively bringing well expenses down," said JT Brady, Senior Manager, FlexRig Support Department at H&P.

> **"The DGB Gen 2 kit solution enables us to substitute pipeline or wellhead, CNG or LNG gas, which not only lowers our diesel consumption but also lets our motor hands work on higher value tasks."**
>
> **TODD FOX,**
> Director of Product Management at H&P

Powering rigs in a dynamic environment

Upgrading rigs with the DGB Gen 2 Kit positions H&P to meet evolving industry requirements while reducing fuel costs. H&P can utilize its current assets and enjoy extended maintenance intervals. With plans to equip more than 60 Cat engines with the kit, the driller has eliminated the need for top-end overhauls and prolonged overhaul servicing periods.

"The DGB Gen 2 kit solution enables us to substitute pipeline or wellhead, CNG or LNG gas, which not only lowers our diesel consumption but also lets our motor hands work on higher value tasks," said Todd Fox, Director of Product Management at H&P. "The Cat Smart EMS also improves our operational efficiency by automatically stopping and starting our engines as needed."

Implementing the DGB Gen 2 kit also supports H&P's climate-related objectives to maintain or reduce GHG emissions per drilled distance compared to 2018.[1]

Based on the positive results experienced to date, H&P plans to upgrade an additional 48 Cat 3512 engines with DGB Gen 2 Kits in 2025.

[1]H&P. "2023 Sustainability Report" www.helmerichpayne.com/media/general/HP_2023_Sustainability_Report.pdf

A NEW LEASE ON LIFE

H&H Marine repowers U.S. Army Corps of Engineers' towboat

The U.S. Army Corps of Engineers (USACE) leverages its engineering expertise to promote stability and improve quality of life. It provides public engineering services to strengthen national security, energize America's economy, and reduce damage risks caused by hurricanes and storms.

In Mississippi, the USACE's Mat Sinking Unit (MSU) places hundreds of thousands of articulated concrete squares which are tied together to form mats, also known as a revetment, along the Mississippi River to provide flood control, prevent riverbank erosion, and prepare navigable waterways for commercial transportation.

The unit's work spans the Memphis, Vicksburg and New Orleans districts' jurisdictions and more than 900 river miles. Normally, 4x25-foot sections of squares are tied together to make a mat, and 35 squares form a launch. Each supply barge holds 533 squares of mat, consisting of 950 tons of concrete.

CUSTOMER PROFILE

H&H MARINE SERVICES

Location: Mississippi

Segment: Inland Waterway

Solution: Repower

Scope of engine use: Cat® C4.4 (Electronic)

Dealer: Puckett Power Systems

The main job for the towboat M/V Harrison is pushing mat barges and tending the MSU. Built in 1988, the vessel's Cat® 3304 engine-generators had been overhauled twice. As the engines had accumulated 90,000 hours of service, USACE sought to give the 1,200-horsepower towboat a new lease on life.

Dockside Turnkey Repower Saves Time and Costs

USACE awarded a contract to Vicksburg, Mississippi-based H&H Marine Services for handling the repower project. Having been awarded previous overhaul projects for the M/V Harrison, H&H Marine was familiar with the towboat and understood the technical requirements needed to enable the vessel to perform the intense mat work.

A pair of Cat C4.4 engines was recommended to repower the gensets for several reasons. With its newly redesigned cooling system, the two C4.4 engines enabled the repower to be performed dockside, rather than at a shipyard, saving considerable time and cost.

As a standardized plug-and-play package, the Cat C4.4 ensures parts availability for the life of the engine while delivering the robust, reliable performance USACE had experienced with its previous Cat engines. Additionally, Cat dealers are located no more than 75 miles from any point on the Mississippi River, ensuring quick and easy access to parts and skilled service support when needed.

Responsive, Skilled Support

Having performed 20 repowers over the past 10 years, H&H Marine turned to Cat dealer Puckett Power Systems to facilitate the dockside project. For more than 20 years, Puckett has provided H&H Marine with dependable and responsive support, supplying parts, drawings and technical expertise for every type of project.

Puckett provided the fittings, hoses and other components to make the generators drop-in ready. Only a day was needed to remove the Cat 3304. The compact, self-contained design of the Cat C4.4 engine enabled H&H Marine to use the existing skid, saving the time and expense of having to cut the skid from the boat.

The engines repowering the genset matched all the existing plumbing and electricals, speeding the installation process. Additionally, the newly redesigned cooling system not only reduced project costs, but also eliminated the need to install new piping; important for older boats' limited room.

With the installation complete, Puckett performed the startup and commissioning services. The entire project took just 10 working days—much faster than typical shipyard repowers.

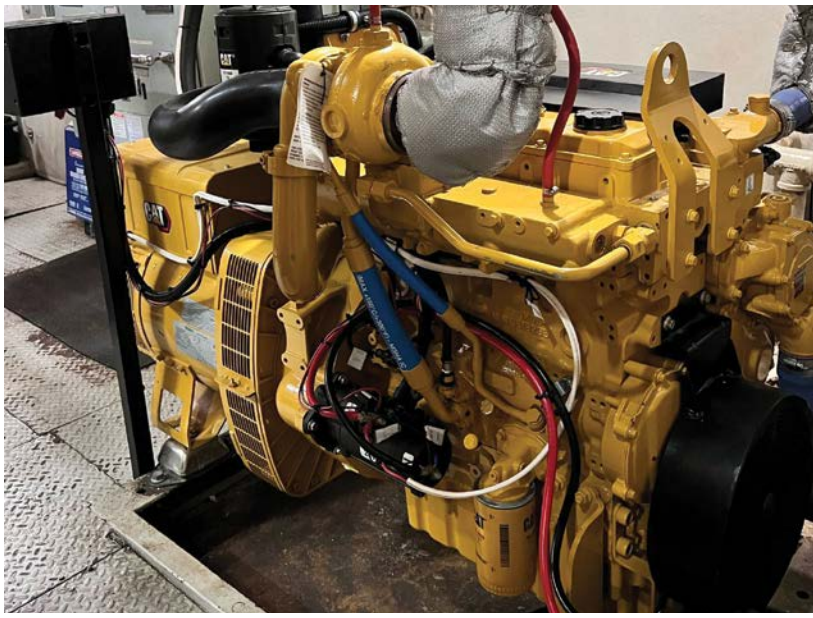
Plug n' Play ease

The M/V Harrison is currently in operation and based on the long life of the previous genset, the USACE looks forward to many hours of use in support of their operation.

"The Cat C4.4 packs a lot of power in a drop-in package, providing the reliability and serviceability workboat operators need," said Paul Henson, owner of H&H Marine Services. "Working with Puckett Power Systems enables us to perform dockside repowers quickly and cost-effectively."

Gary Sarrat Jr., Caterpillar Marine inland & tug segment key account manager adds:

"The trim design and single circuit cooling system allow the electronic Cat C4.4 engine to be a turnkey genset solution that keeps repower costs low and meets today's towboat operators' needs."



> **"The Cat C4.4 packs a lot of power in a drop-in package, providing the reliability and serviceability workboat operators need."**
>
> **PAUL HENSON,** Owner, H&H Marine Services

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Lantz Corners, PA
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Manada Hill, PA
336 Fairville Ave.
717-526-2121

Mansfield, PA
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Milesburg, PA
1025 N Eagle Valley Road
814-355-3500

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190 Cleveland Brothers Road
570-538-2551

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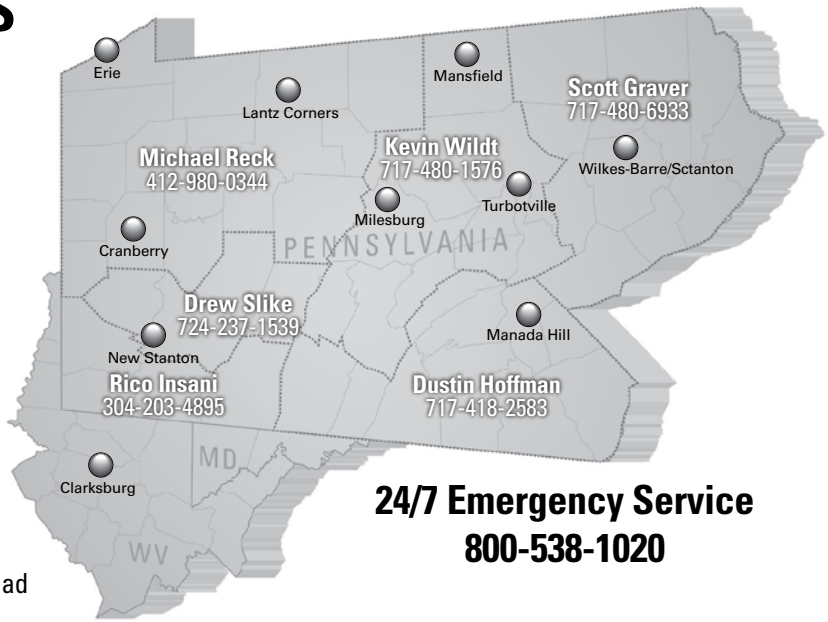
Contact Your Local Parts & Service Sales Rep:



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NEW G3500K SERIES GAS GENSETS

If you're looking for reliable, quick-responding, high-efficiency prime or continuous power, choose the new Cat® G3500K series gas gensets. They're designed for reliable performance in a wide range of applications and demanding environments including high altitudes and higher ambient temperatures.

The first product in the series, the G3520K HR (High Response) is available now with four additional models to be launched later this year. Rated at 2.5 MW of continuous power and available in 50 and 60 Hz packages, the G3520K starts quickly and accepts high loads quickly, ramping up to 100% faster than previous models.

To learn more about the benefits of the new G3500K series and its suitability for your application, contact the power systems experts at our dealership.