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# A CUSTOMIZED APPROACH TO POWER

Professional Power Products Inc. designs and manufactures completely customized power plants for engine and gen-set dealers



Working with engine and generator dealers and distributors, Professional Power Products Inc. (PPPI) customizes complete power plants, manufacturing many of the components such as enclosures, UL 142 and 2085 rated fuel tanks from 25 to 15,000 gal. capacities, load banks, switchgear and gen-set control panels in-house.

**BY DAWN M. GESKE**

**T**he power generation market has a wide breadth of standby and continuous power generation applications — each one different from the next. These unique and sometimes challenging projects have very specific requirements that require very customized packages, including custom-built enclosures, specially wired control panels and custom-manufactured switchgear and load banks. In addition, the growing size and power output of these power generation packages make transport and installation of engines, generators, switchgear, load banks and fuel tanks a challenge.

Professional Power Products Inc.

(PPPI) specializes in unique power generation applications, creating completely customized on-site power plants. Working with engine and generator set dealers and distributors such as Caterpillar, Cummins, Kohler, Detroit Diesel, GE and Waukesha Engine, PPPI uses, in most cases, the dealer's engine and generator, integrating it into an enclosure with the other required power components.

"We work with a number of different engine manufacturers to design and package their product to include anything from an enclosure, fuel tank, load banks, paralleling switchgear and controls," said Ken Trent, vice president of sales at PPPI. "We build,

service and test the items around the engine-generator set.

"We really are vertically integrated. We have our own metal stamping, metal forming, welding, panel wiring, enclosure wiring, blasting, painting, plc programming and test cells. We have more than 30 engineers between mechanical and electrical to design these highly customized projects."

PPPI manufactures the enclosures, UL 142 and 2085 rated fuel tanks from 25 to 15,000 gal. capacities, load banks, switchgear and gen-set control panels in-house. The company works directly with the engine or generator dealer to meet the specifications from its customers. The dealer typically doesn't have the capacity to produce the full power plant, which can range from 1 to 3.5 MW.

The level of customization PPPI provides is dependent on the requirement from the dealer. In some instances, PPPI uses the controls already equipped on the engine and generator. In other instances, it is instructed to design control panels from the ground up and create a control room for an operator as well as producing specified switchgear and load banks.

"We can design the whole system," said Trent. "It really gives the application simplicity since everything is here. And, we test everything here before it ships so we're not dealing with issues in the field. We really provide the dealer a one-stop shop."

At its Darien, Wis., facility, PPPI designs and builds the enclosure, equipping it with all the specified power components per the requirements of the project. The 175,000 sq.ft. facility allows PPPI to set up the full system — produced in modules — which can be moved and transported to the site.

High ceilings also allow PPPI to



Typically, PPPI receives the engine and generator from a dealer and designs the power system to the dealer's customer's requirements. It works with Caterpillar, Cummins, Kohler, Detroit Diesel, GE and Waukesha Engine, etc., dealers and distributors.

move modules up and over each other, using eight ceiling cranes with 200,000 lb. pickup capacities. With the ability to completely set up the power plant, PPPI can test the system before installation and avoid any issues that could arise, making site installation smooth.

While PPPI initially started off in 1992 as a switchgear and controls company, it quickly branched out to this niche power generation market in 1997. "Data centers, telecom, hospitals, industrial office buildings, financial centers are really what drove the growth for us for a long time," said Dan White, mechanical engineering manager at PPPI.

Over the last year, PPPI has remained busy with a flurry of on-site power installations including a 10 MW backup power system for a data center at an international government institution located in New York City, N.Y. Working with a Caterpillar dealer in New York, PPPI constructed one enclosure to house four 2.5 MW Caterpillar 3516C gen-sets. The generators were built with redundancy, and the enclosure features additional space for expansion.

"This is a little bit different than

normal," said White. "Most places would have just four enclosures. On this project, the end user wanted everything under the same roof in modules that go side by side in a massive package. There's also a switchgear enclosure on the side. Basically, you can start at one end and walk from engine to engine to engine to engine and then end up in the switchgear room. It's a pretty

neat design."

Another challenge of the project was sound attenuation. Because the customer wanted one enclosure for the whole assembly, PPPI worked to attenuate the added sound created by four engines running in parallel.

"The sound is kind of a challenge because there are four engines running side by side," said White. "Anytime you have an identical sound source, it adds to the overall sound level. If you have two identical sound sources it can be up to 3 decibels higher than what you started with. By the time you get four (engines) in a line, it makes it a lot harder to sound attenuate."

To ensure the noise ratings for the generators reached the aim for this project or any project PPPI is involved with, it worked with an independent test lab to provide accurate sound ratings for all the components used. For the project in New York City, the company installed special baffling and insulated hoods in the enclosure, taking the unit to 75 dB(A) at 3 ft.

With 40% of PPPI's business focused on the international market, the company recently secured 20 3 MW backup power installations in Africa. PPPI mated 4500 hp GE diesel engines and AVK generators together using the engine frames as the base



PPPI prides itself on being a vertically integrated company. It produces products such as switchgear and load banks from the ground up. It also does its own metal stamping, metal forming, welding, panel wiring, enclosure wiring, blasting, painting and plc programming.



With an in-house test cell, PPPI is able to test all of the components within a power system to ensure there are no issues when the power plant arrives on-site for installation.

of the enclosure. In addition to the enclosures and bases, PPPI is supplying the load bank, switchgear, and engine and generator control panels for the project.

Each of the 20 units ships in three pieces, with 12 units already on-site. The engines operate at 900 rpm, which PPPI said increases the longevity of the system.

PPPI is also working on a cogeneration system installed in Manhattan, N.Y., for an office building as part of a green initiative. Three 2050 kW Caterpillar 3520C natural gas generators are mounted to the roof of the building, providing electricity, heat and hot water 12 hours a day, independent of the grid. The cogen plant is built at PPPI and shipped to New York in 16 modules. The generators are fueled from the city's natural gas supply and are designed to capture exhaust from the engines to produce steam for heat and hot water.

On-site, PPPI assists with the installation, which was prepped in advance by plumbers and electricians to bring power, hot water and steam to the facility. The project was completed in October.

"We think the payback with cogen-

eration is quite efficient, especially with the available incentives," said Trent. "Cities are big on green initiatives right now. A lot of city grids can only support so much power, so a lot of these utility companies are actually urging these types of applications for peak shaving."

PPPI also has plans for growth with a new plant that sits on 12 acres in Reno, Nev. The site will service the West Coast and help to offset the rising cost of freight.

"This year we've been fortunate," said Trent. "We're still living off of backlog built up over 2008. What we have found is a lot of our business has moved a large function overseas — that's really kept us growing. We see customers looking for packagers that can assist with the full package — not just the fuel tank, enclosure, load bank or switchgear — someone that can help tie all these items together in a package that answers all of the customer's needs in a single package." **dp**

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