



An Isuzu-driven generator set is providing power for a Northern California school and camp complex that is dedicated to helping troubled teen boys and girls heal from some of society's worst problems. The gen-set, which went online in February, is used to generate 65 kW of prime power. The unit was supplied by JG Engine & Generator, a Sacramento, Calif.-based dealer for Valley Power Systems Inc.

POWER TO HELP TROUBLED TEENS

Isuzu gen-set package provides prime power to remote boarding school dedicated to rescuing young lives

BY MIKE BREZONICK

It's not uncommon for power generation sets and systems to literally mean the difference between life and death in some circumstances, such as standby power systems at hospitals, fire and rescue operations, etc.

Yet one generator set in Northern California is operating in a different sort of life-or-death situation. There, an Isuzu-driven unit is providing power for a school and camp complex that is dedicated to helping troubled teen boys and girls heal from some of society's worst problems, including homelessness, physical, emotional and sexual abuse, exploitation and drug and alcohol abuse.

The Julian Youth Academy is a fully accredited, private Christian residential boarding school for teenagers in need of full-time supervision and redirection located in the Mt. Lassen region of Northern California. It is operated as part of Teen Rescue, a 21-year-old nonprofit organization dedicated to providing support services to families with teens in crisis, as well as a nationwide referral service to other treatment programs. The school is intended to provide firm but loving intervention, interactive education and life skills training, and it's open to all families regardless of race or religion. Tucked into a placid, natu-

ral surrounding, the school seeks to provide education and counseling, along with fun activities such as hiking, swimming, water sports, etc.

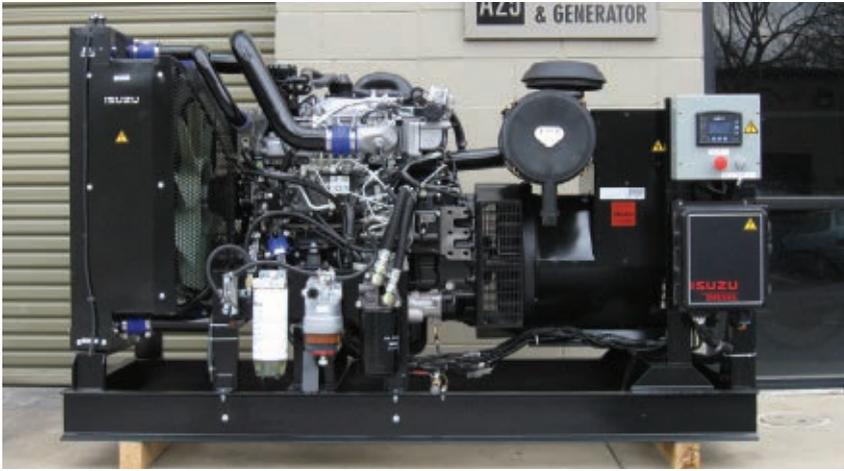
The JYA camp is essentially a self-contained city with an electrical grid approximately three-quarters of a mile long. The 245 acre complex encompasses a total of 30 structures, including housing units, a kitchen that seats 250, classrooms, a maintenance shop and offices. It also includes a sewer pump station running the county-permitted sewer system. Three-phase, 480 V power is delivered to transformers at each structure that convert it to normal building voltages, with single-phase power sent to some remote buildings as well.

Because of its remote location, the facility relies on generator sets to address its power needs. A system of three gen-sets has been used, with the newest an Isuzu-powered unit supplied by JG Engine & Generator, a Sacramento, Calif.-based dealer for Valley Power Systems Inc., the Isuzu engine distributor headquartered in City Of Industry, Calif.

"Approximately six years ago, I received a call from Steve Stanley, the person that maintains the generators, along with the municipal sewer, water and electrical system for the camp," said John Graesser, dealer principal of JG Engine & Generator. "He was running a pair of large gen-sets under very light loads. He had heard that Isuzu engines had exceptional fuel economy and long life from other off-grid customers.

"When we penciled out the savings on fuel, we found that a 60 kW gen-set powered by an Isuzu 4BG1TRV engine would pay for itself in less than one year on fuel savings alone. He purchased one and the savings proved to be true."

That set ran reliably — it currently has more than 25,000 hours on it, Graesser noted — but when it was determined a larger gen-set was needed, the customer opted for a different manufacturer's engine on the unit that was again packaged by JG



The generator set is based on a Tier 3 Isuzu 4HK1XYGV01 diesel engine rated 173 hp standby, 155.6 hp prime at 1800 rpm, that drives a Stamford Newage UCI274E generator rated 128 kW. Also included in the package is an oversize Donaldson air cleaner, Denso side-by-side radiator/charge-air cooler module and DynaGen GSC400 controller.

Engine. "They were buying more on weighted-initial price on that one," Graesser noted. "They would run the larger 180 kW set as needed, with the Isuzu set being the main unit."

"Due to the fuel consumption of the other gen-set, they decided to focus

on total cost savings and purchased a new Isuzu unit to realize similar fuel savings and reliability as with the first Isuzu set."

The new Isuzu-powered gen-set was installed earlier this year and at this time has more than 1400 operating

hours running continually. "This generator set was first proposed to the customer two years ago," Graesser said. "In December of '09, we received the order. The unit was completed Feb. 5 and delivered to the customer Feb. 8. It was installed over the next week and started 24/7 operation on Feb. 15."

The current electrical load is approximately 65 kW, but Graesser said it is expected to rise to approximately 90 kW in the summer.

The generator set is based on a Tier 3 Isuzu 4HK1XYGV01 diesel engine rated 173 hp standby, 155.6 hp prime at 1800 rpm. The engine package also includes an Isuzu-supplied oil filter system with an Isuzu-supplied fuel filter system incorporating 4 µm pre-filter and 2 µm final filter, along with a Ren oil makeup system. The oil change interval is 500 hours, which is standard for most Isuzu industrial engines.

Intake air is delivered to the engine through an oversize 11 in.

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Donaldson FRG air cleaner with pre-filter. Graesser said the Donaldson assembly was chosen because forest fires are not uncommon in the area "and this gives the engine more running time before a plugged air cleaner could cause a problem to keep the water system running to fight any fire threat they may have."

The cooling package consists of an Isuzu-supplied Denso side-by-side radiator/charge-air cooler module with a 26 in. blower fan directly driven off the front of the engine. The cooling system also includes a fuel cooler, through which the fuel return line is routed. This, Graesser said, ensures that fuel returned to the day tank is at a stable temperature, which reduces the chance of damage to the engine's common rail fuel system and results in improved reliability.

The engine drives a Stamford Newage UCI274E generator from Cummins Generator Technologies

rated 128 kW. The generator incorporates a 12-lead high Wye winding to provide 480 V, three-phase power.

The engine and generator are mounted on a welded steel frame, with four Korfund RDC2-425 fail-safe elastomeric mounts used for isolation. The radiator assembly is mounted to the welded steel frame using a pair of two-piece, center-bonded, through-bolt mounts.

"The radiators are mounted to the skid frame, not the engine," Graesser said. "Engine mounts and generator mounts are unique to the vibration characteristics of each unit. All panels are skid mounted for customer convenience and also to keep them from being affected by vibration."

The gen-set is operated through a DynaGen GSC400 controller that communicates with the engine CAN system to monitor engine parameters such as speed, oil pressure and engine temperature. It will display a series of preset codes that help in diagnostics and troubleshooting. For this application, the controller is programmed to scan engine parameters, speed, frequency, voltages, Amps and hours every six seconds. "The person checking the unit knows everything they need to in a short amount of time," Graesser noted. "It also holds an event viewer for use in troubleshooting problems or just knowing start/stop times."

The system also includes a three-pole, 200 Amp Cutler Hammer FG3200 breaker for mains protection.

The gen-set is installed in a building just outside the school and housing areas. The exhaust is routed through a Hapco Super Critical Hospital Grade VCS series, side in, end out. Typical attenuation is 30 to 42 dB(A). Exhaust gases flow through the silencer in a vortex motion and noise reduction is accomplished by a combination of absorption and annulling of noise waves resulting in reduced silencer diameters. As the radiator exhaust is pointed away from the other buildings, no other sound attenuation measures are required.



An existing 60 kW Isuzu-powered generator set has delivered more than 25,000 hours of reliable service at the camp.

The gen-set utilizes two fuel tanks. A 5000 gal. main tank is outside the gen-set building within a containment structure. That tank feeds a 15 gal. day tank inside the gen-set structure. Fuel going from the large tank to the day tank passes through a pair of Racor filter/fuel-water separators, the first a 10 µm unit and the second 2 µm. The Racor units can be serviced with the generator running, Graesser noted.

All of the fabrication, machining, wiring, painting, assembling and testing was done by JG Engine & Generator, a full-service Isuzu dealer. About the only jobs not done in-house are boring, surfacing and powder coating, Graesser said.

Each unit is custom built for the specific application. "Packaging product is about 50% of our business," Graesser explained. "We typically package prime power products for 24/7 applications, with special applications being a large part of that."

Considering how this particular gen-set is helping to turn young lives around, it would indeed qualify as a special application. **dp**

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