

POWER PROFILE

Customer: Jefferson X-Ray Group

Location:

Glastonbury, Connecticut

Customer Business Issue:

Power conditioning, uninterruptible power, and backup power supply for critical MRI equipment

Solution:

- Cat® Uninterruptible Power Supply (UPS) 300 kVA
- Cat 3412 550 kW Generator Set (with weather protective enclosure)
- Generator Set Start Module

Cat® Dealer:

H.O. Penn Machinery Co.
Newington, Connecticut



Jefferson X-Ray Group, located in Glastonbury, CT, offers a park like setting for patients and employees.

POWER NEED

Jefferson X-Ray Group (JXR), the largest private practice radiology group in Connecticut, required a continuous power system at its Glastonbury office to ensure seamless operation of critical MRI, CT, Ultrasound, Mammography, Nuclear Medicine, and Diagnostic Imaging equipment. Located in a remote region of the Hartford metropolitan area, the physical distance between the image center and the transformer contributed to frequent power outages, interference on the power line and other power quality issues. The sensitive nature of JXR's new MRI equipment made it especially important to implement a system that would insulate the power supply from common regional brownouts and power losses, one of which had previously damaged the facility's \$50,000 circuit board.

JXR's electrical contractor approached Cat dealer H.O. Penn Machinery Co. to supply a Cat generator set, Cat Uninterruptible Power Supply (UPS) and a generator set start module. "After determining our need for a power conditioning unit, we evaluated a variety of UPS models," said Mark Weathersbee, IT director at JXR. "We were impressed with the reliable flywheel-based technology offered by the Cat UPS over that of battery-based systems, and felt it would work most effectively to meet our power quality needs." The UPS provides constant power protection against surges, sags and power interruptions by canceling harmonic distortion. In addition to the UPS, the dealer also recommended the Cat generator set start module for maximum reliability. It provides up to 1,725 cold cranking amps at 24 VDC to assist and back up a generator set's starting batteries.

SOLUTION

H.O. Penn supplied a Cat 3412 550 kW generator set and Catset, Cat UPS 300 kVA and Cat generator set start module to meet JXR's power needs as defined by the electrical contractor. As the facility could not provide exclusive space for the UPS, the compact nature of the unit made it possible for it to be installed in an existing telephone room with little modification to the system. "The UPS itself had a smaller footprint, and it also did not require ancillary equipment or specialized temperature control," explained Weathersbee. "As such, we were able to easily accommodate it in an available space."

The Cat generator set start module provides redundant starting power that is supplied directly from the UPS output, providing a healthy and continuous power source that does not require replacement. AC power from the UPS output is supplied to the generator set start module, which converts the AC power to DC power. The generator set cranking batteries are connected in parallel with the DC output of the generator set start module, separated by an inline diode to provide isolation between the two DC sources. The engine starter is wired to the DC output of the module and can be supplied by either of its starting batteries, ensuring that the starter motor always has a strong and reliable DC source for engine starting.

The complete system was designed to condition power being supplied to all critical radiology equipment, including the new MRI machines, while also conditioning the power that enables the office's general operation. In addition, the generator set component of the system could provide backup power for the entire facility in the event of a longer-term power loss.

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As the manufacturer of JXR's new MRI machines expressed initial concern regarding the UPS unit's ability to meet the stringent voltage fluctuation requirements of its sensitive equipment, Cat dealer H.O. Penn Machinery Co. worked with the manufacturer to ensure these needs were met. "According to the manufacturer, the specialized MRI equipment recently installed at JXR would tolerate a maximum system voltage fluctuation of positive or negative two percent," explained H.O. Penn sales engineer Mike Thibault. "As the Cat UPS 300 kVA allows for the same tight output voltage deviation maximum of positive or negative two percent, the manufacturer was confident that the installation would be secure."

RESULTS

Since its initial installation in August of 2003, the Cat continuous power system has provided improved power quality that has insulated JXR from frequent utility power dips and sags. "Our monitoring system has shown a significant number of power fluctuations from the utility over the past year and a half few years," said Weathersbee. "Despite these fluctuations, the Cat UPS has delivered clean, conditioned power to our facility 100 percent of the time."

JXR has also additionally recently built a data center within the Glastonbury facility to benefit from the power quality and protection of the Cat continuous power system. The data center houses several servers that manage information for all five JXR radiology offices, as well as the company's central business office.

For more information, please visit cat.com/powergeneration



Cat® UPS 300 kVA (Uninterruptible Power Supply) unit with flywheel-based technology.