Uninterruptible Power Supply System Saves Downtime and Lost Materials for Carpet Manufacturer

The first placement of Caterpillar's 250 kVA Uninterruptible Power Supply (UPS) system at a plastic extrusion plant in Charlotte, NC, proved to be a powerful success. In November 1999, Shaw Industries' Plant 25 installed the new UPS system on one of its four extrusion lines. The first power interruption occurred on Jan. 6, 2000, the second on Jan. 23. During both interruptions, the UPS system kept power supplied to the extrusion line, preventing downtime and lost materials. In 1999, power anomalies were the second-leading reason for Plant 25's downtime, with more than 150 hours attributed to all four lines.

Shaw Industries manufactures about 3,100 styles of tufted and woven carpet for residential and commercial use. Carpets are sold under a variety of brand names. Plant 25 has been in operation since 1970 and became a part of Shaw Industries when Shaw bought the Armstrong Carpet Division on Jan. 1, 1990. The Shaw Industries application is a joint effort between EPRI (Electric Power Research Institute), Palo Alto, CA; Duke Power, Charlotte, NC; and Caterpillar, Inc., Peoria, IL. EPRI was searching for a site to demonstrate the new UPS technology when Duke Power brought Shaw Industries, the world's largest carpet manufacturer, to the group's attention. Although Duke Power has worked closely with the plant to keep power consistent, the problem of momentary outages and voltage sags continued to be a problem.

A utility-power voltage surge, sag or outage disrupts the entire extrusion process. This means uneven quality: plastic threads can break, incomplete spools roll up, and equipment can become 'gummed-up' with plastic.

"If a line goes down, waste occurs and the process has to start over," says Don Hill, maintenance manager of the carpet division at Shaw Industries. "If we had not had the UPS system in place on Jan. 6, the line would have gone down and the plant would have lost 139 minutes of production plus the amount lost for scrap material on startup. But the flywheel performed exactly as expected, and we are now discussing placing additional UPS systems on our three other lines."

When the Cat UPS System senses an abnormal voltage or interruption, the flywheel begins to supply power. The flywheel bridges the gap between power quality fluctuations, which often last less than a second, and service reliability, which includes voltage or current anomalies lasting up to a minute or longer. The system can also be configured to send a start signal to a standby genset. At maximum kVA load, the flywheel will provide power for 10 to 15 seconds, allowing time for the genset to start and assume the load. After the event, system operation returns to normal.

The new Cat UPS system is designed and manufactured to Caterpillar specifications and tested with a genset for total system integration. Convenience features include an easy-to-read LCD panel, audible alarms, paging, and a microprocessor-based operation allowing for programmable genset walk-in and other set-up parameters. Remote UPS monitoring through Internet or direct-dial access is also available. The

Cat UPS system can also provide additional protection during capacitor switching transients or voltage fluctuations, from normal customer operation.
Caterpillar, Inc., 100-T N.E. Adams St., Peoria, IL 61629; 309-675-1000.

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