

Manufacturing for Tomorrow

VOLUME 3 / ISSUE 1

GPU's Business Resource Center

Suppose as an industrial customer, you have a question for GPU Energy—on rates, energy efficiency, technology, or a host of other issues. The place to call is the GPU Energy Business Resource Center (BRC).

Designed to provide one contact resource for its industrial and commercial customers, the Business Resource Center offers all the current channels of communication:

- A toll-free telephone number
- An e-mail address
- Fax numbers
- A Business Resource Center web site on the Internet

The BRC is staffed by highly skilled Business Consultants who have expertise about GPU's infrastructure business and customer energy needs. These consultants can help with:

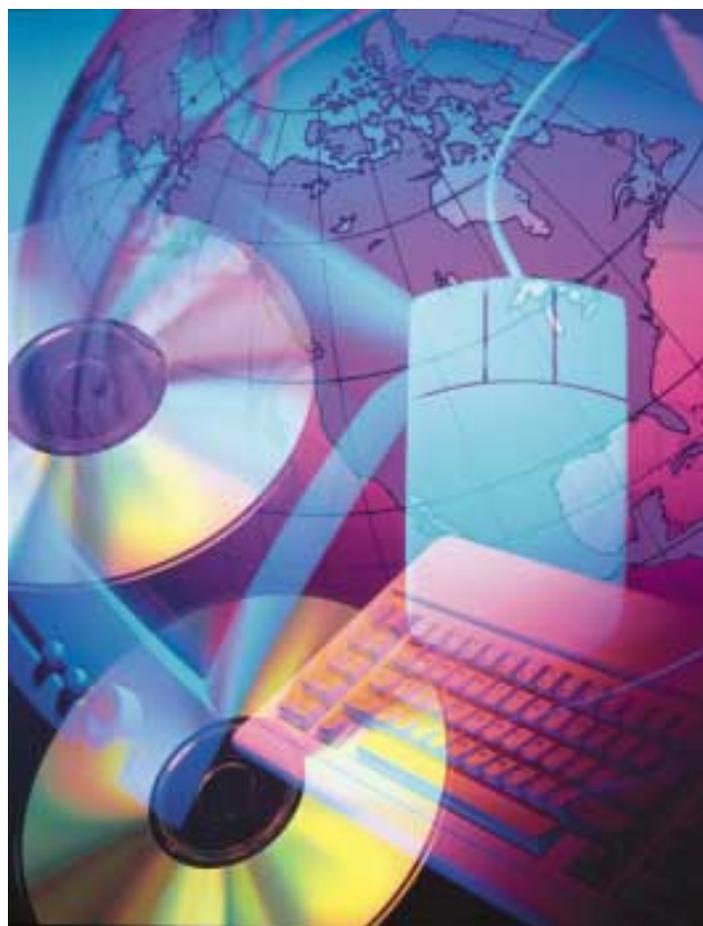
- Billing and account inquiries
- "Best rate" advice

- Energy efficiency programs
- Energy use analysis
- Load profile services
- Trade/professional allies information
- Power quality facts
- Y2K questions
- Deregulation issues

Technical questions are referred to *Questline*.

Member Card

Pennsylvania and New Jersey customers have been provided with a "Member Card" which contains their Member Number and Account Number, as well as, Business Resource Center phone and fax numbers, e-mail addresses, and the web site address. Through a series of targeted direct mailings, customers will learn more about the special services that the Business Resource Center has to offer.



Contact Information

The Center's business hours are 8:00 a.m. to 5:00 p.m., Monday through Friday. If you have any questions for the Business Resource Center or would like additional information,

please call 1-800-543-4655 or visit our web site at www.gpu.com/gpuenergy. Pennsylvania customers can e-mail the BRC at PARC@gpu.com. New Jersey customers can e-mail the BRC at NJRC@gpu.com.

Compressed Air Challenge

When looking for ways to save energy, don't overlook your plant's compressed air system. The Compressed Air Challenge has recently been created by the U.S. Department of Energy in response to its goal of decreasing our country's energy consumption and reducing greenhouse gases. This initiative is designed to build awareness among users of compressed air about the benefits and approaches for improving and maintaining compressed air system efficiency.

Seize the Opportunity

Compressed air systems offer a significant energy reduction opportunity. A common utility, compressed air transcends industry lines and can account for as much as 10 to 20% of a manufacturing facility's electricity bill. By seizing the opportunity to save energy, your operation's total plant electrical costs can be reduced by as much as 5%.

Leak Repair

When compared to other system optimizing measures, leak repair generally offers the most significant return on investment. Although leaks are continual, they should account for no more than 10% of total air usage. To reduce

leakage, check all of the plant's point-of-use connections for the slightest hissing sounds and practice a leak reduction program that is ongoing and comprehensive for insured effectiveness.

Lowest Possible Pressure

The pressure in the compressed air system should be kept at the lowest level that will allow satisfactory operation of the tools. Compressor efficiency decreases as output pressure increases and higher than necessary pressure causes higher leakage.

Larger Piping, Fittings, and Valves

The use of larger piping, fittings, and valves with low flow resistance will not only reduce pressure drop but will allow for system expansion. To save cost on labor and leaks, you can invest in some of the new piping products specifically designed to eliminate leaks by using non-corrosive materials and leak-free fittings.

Correct Sizing

Correct sizing of the motor drive will prove cost effective and will maximize efficiency. If you are replacing the motor on an existing compressor, do not assume that the replacement motor should be the same size as the existing motor. Size the motor according to your plant needs.

More Tips

Here are some additional efficiency tips to explore:

- Valves on a compressed air system should have minimum restriction and pressure drop when the valves are open. Also, valves should have firm air shutoff in the closed position.
- Use proper filtration and drying equipment.
- Separate compressor systems may be more energy efficient than a single system providing uniform high pressures if air equipment can be divided between low and high pressure applications.

- When purchasing new equipment, ask your vendor if they comply with CAGI (Compressed Air and Gas Institute) standards, so you can be assured of comparing apples to apples.
- Find ways to utilize waste heat off the compressor for the rest of the plant.
- Pressure regulators, boosters, and other equipment can provide point-of-use alternative pressure requirements.
- Look for places where compressed air is in use, such as blow-off applications. Check to see if a blower or fan could produce the same results.

The Commitment

To fully commit to the Compressed Air Challenge, quality maintenance is required on a regular basis, for consistent energy savings. Committing to preventive measures today will avoid problems in the future and will improve the air compressor's performance and efficiency for many years to come.

Multiple-stage compressors often offer significant power savings over single-stage compressors, and can offer paybacks of one to two years.

(Ingersoll-Rand Company)



Dip Proof New York Wire

When the lights flickered at New York Wire Company's plant in Mt. Wolf, Pennsylvania, the company knew it could mean trouble. Even a momentary voltage sag in electrical power could result in a shut down of the production line. It wasn't the production line itself that experienced the problem, but the complex system of environmental controls that oxidize the VOCs and other airborne contaminants to ensure that the company complies with environmental regulations. And with the pollution control system shut down, the production line could not continue to operate. Getting everything back into production would take hours.

While sags in electrical power only occurred two to six times per year, the resulting disruption was annoying and costly. Frank Gaiteri, VP of Engineering, made GPU Energy aware of the problem. GPU representative Bob Gallo suggested that New York Wire invest in a ride-through device like a Voltage Dip-Proofing Inverter (DPI) and helped determine what size would be appropriate. After a demonstration by Russell Holt of Dietrich & Associates, the company purchased and installed a unit in mid February. The DPI will help enable the company to ride through power dips or interruptions lasting up to 3.6 seconds.

GPU Adjusts Line Breaker Setting

The line circuit breaker at the substation serving NY Wire was

set to reclose at the standard five seconds after its first trip, due to temporary faults. Because there were not any components prohibiting the reclose time to be reset, Jim Sarver, Distribution Asset Strategy Engineer, reset the reclose time to one second to enable the company to ride through power dips.

A Preventive Solution

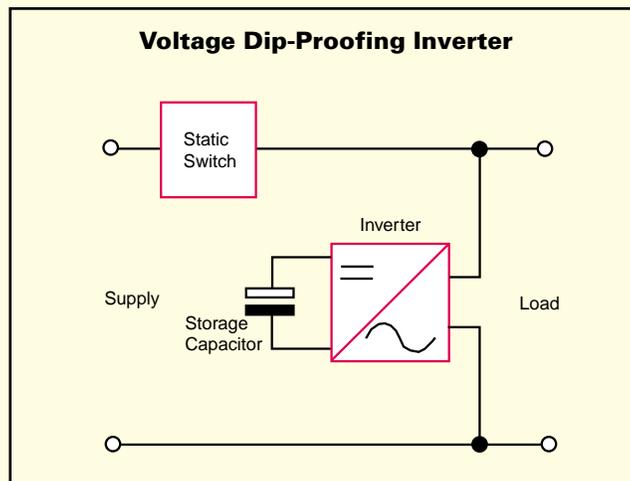
Designed specifically for use in industrial and commercial environments, the inverter provides a preventive rather

than a curative solution. It consists of a static switch in series with, and an inverter parallel to, the load. Switch over occurs in 600 μ s. Since energy is stored in a capacitor instead of a battery, there are no replacement costs, maintenance costs, or hazardous waste.

During the stand-by operation, the static switch supplies power directly to the load, the inverter is switched off and the capacitors are charged to the full operation voltage. The supply voltage is constantly monitored for

deviations; should there be a discrepancy of more than 35% from nominal (variable from 50% to 90%), the static switch is switched off and the inverter is activated.

Protecting an entire facility may include large, expensive systems such as common battery UPS systems or ferroresonant transformers (CVT's). However, problems with voltage sags and momentary interruptions can often be prevented with a less expensive DPI.



When a shut down occurs, labor and material costs alone are approximately \$800. When evaluating the potential financial losses incurred with power quality problems, the approximate cost of \$2700 for the DPI is worth the investment. Payback should be achieved in a relatively short period of time.

Dip Proofed

The lights flickered the last week of May—but instead of a shut down, New York Wire rode through the disturbance, thanks to its DPI.



New York Wire installed a Dip-Proofing Inverter similar to the unit above. The DPI should enable the company to ride through power dips and interruptions lasting up to 3.6 seconds.

What Is a Voltage Sag?

According to IEEE, momentary voltage sags are very different from service interruptions. An interruption is a complete separation of a load from the source of electric energy. A voltage sag is a sudden voltage drop while the load remains connected to the supply.

Voltage sags are usually caused by faults or sudden major load increases. Modern process controls are much more likely to be upset by sags than from power interruptions.

QUESTLINESM

Save time and money by utilizing *Questline*, a free service offered to GPU Energy customers.

Questline provides assistance regarding technical information or problem-solving information relating to environmental, economic, technical, vendor, and supplier questions.

In response to an employee suggestion box idea, a GPU Energy customer wanted to know the \$/kW cost of a trash-burning electric power generation system including the initial and operational costs involved in installing and running such a system.

Questline contacted various sources and the following cost information was provided:

- Approximate installation costs are \$260/kW.
- Approximate operational costs are \$65/kW.

Our company is installing an Italian-made induction furnace. The furnace takes 660V, three-phase power. We need to find a source of 1000V switchgear equipment to be able to install a feed off the primary for this furnace.

Questline found the appropriate company and contact person that provides the switchgear equipment with the specifications mentioned. We are faxing you their information should you wish to contact them.

Our company needs general information on protection from surges, black-outs, and brown-outs.

Electric power conditioning and protective equipment are available as transient or surge suppressors, voltage regulators, constant voltage or isolation transformers, or static, rotary, and hybrid uninterruptible power supplies. They are employed with sensitive electronic apparatus such as computers, controllers, and communications devices. Included in this category are static and rotary UPSs, isolation transformers, transient suppressors, and voltage regulators.

Computers and other sensitive electronic equipment such as programmable logic controllers (PLCs), process controls, communications equipment, and similar electronic apparatus are sensitive to fluctuations, disturbances, and interruptions in their power supply. Because malfunctions and failures in this type of equipment can be extremely costly, a wide variety of power conditioning and protection equipment has been developed to counter these problems.

Questline is sending you more specific information regarding your wide variety of options.



To better assist you, GPU Energy provides no-cost, confidential, fast-turnaround technical information and problem-solving assistance.

Phone 1-800-824-0488
Fax 1-614-848-8990
or visit www.gpu.com
www.questline.com/GPUEnergy

FREE STUFF!

GPU Energy has information for you. Just let us know what you would like and where to send it.

- Compressed Air Reference Guide, including:
Optimizing the Operation of an Existing Compressed Air System
- Power Quality Testing Network: Performance of an ASD Ride-Through Device During Voltage Sags
- TechCommentary*: Powder Coating and Curing
-
- Information on *Questline*
- Please have a GPU Energy service representative contact me.

Comments:

Please provide your name and address so we can respond to your request for information.

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Company

Address

City

State

Zip

Phone

Fax

E-mail

- My name should be removed from your mailing list.

Powder Coatings

Powder coatings are replacing liquid finishes and are finding an increase in usage on substrates that often are temperature sensitive, such as plastics, wood, or fiberboard. Companies often turn to powder coatings to solve emission problems. Then they discover that 95% of the powder coating ends up on the part to be coated. Usage rates with sprayed paint hover around 50 to 60%. Because of its material savings and other factors, powder coatings systems can have payback periods of 24 months or less. So by solving environmental problems and offering ways to save money, an increasing number of companies are finding new ways they can use powder coatings.

- New products and process development
- Proving technical feasibility or large-scale commercial viability of a new approach
- Troubleshooting customer problems

Because of its material savings and other factors, powder coatings systems can have payback periods of 24 months or less.

An Array of Ovens

A variety of curing ovens are maintained so that Morton can simulate the actual curing methods at customer sites or suggest the best combination to get the results the customer wants to achieve. The facility provides:

- Two 6'x6'x6' walk-in electric convection ovens
- A 6'x6'x6' walk-in gas convection oven
- An electric infrared oven that can cure with short, medium, or long wavelengths IR
- A flat ultraviolet line with emitters producing 600 watts/in²

Curing can also be sequenced in a variety of ways including a front-stage electric IR followed by UV.

Trends

Paul Horinka, Senior Applications Engineer, Morton Powder Coatings, sees a big

Total Finishing Solutions

To help their customers and potential customers find the right finishing solution, coating suppliers offer customers assistance in finding the optimum curing process. For example, Morton Powder Coatings maintains an array of different ovens at its application engineering laboratory in Reading, Pennsylvania. The ovens are used for:

- Testing samples and prototypes
- Customer demonstrations

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610-396-8522

attn: *Manufacturing for Tomorrow*

Or fold it on the dotted line, close with clear tape, and mail the form to GPU Energy.

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demand for powder coatings that cure at lower temperatures. Lower temperatures reduce energy costs and enable a wider range of substrates to be coated. He cited a recent example of a motor manufacturer that now powder coats all external surfaces of the entire motor assembly just prior to

it being boxed and shipped. By curing at less than 250°F, neither metal nor non-metal components

Lower curing temperatures reduce energy costs and enable a wider range of substrates to be coated.

are degraded. And coating just prior to shipping has many

production advantages including eliminating delays for curing in the production line and avoiding damage to the finish during manufacturing and transport.

Contact Information

If you are interested in learning more about how powder coatings can be used to solve your particular finishing situation, contact a powder coating vendor. You can phone Morton's Customer Service Center at 1-800-367-3318.

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Comments, suggestions or questions about Manufacturing for Tomorrow should be addressed to:

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Manufacturing for Tomorrow

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<http://www.gpu.com>

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