

Current

CARMEL-BASED MISO USES MARKET ST

Imagine if you woke up in the morning, flipped on the light switch and nothing happened. No lights, no microwave, no hair dryer and worst of all, no coffee to get you going. What the hey? You pick up your iPhone and call your local utility only to receive this recorded message: "We're sorry, but all of our available resources are in use at this time. We will restore power as soon as possible. Have a nice day."

Not likely to happen you say? You're right. Thanks to the folks at Midcontinent Independent Transmission System Operator (MISO), an independent regional transmission organization (RTO) headquartered in Carmel. MISO works 24/7 to keep the lights on—or in industry-speak "ensure the reliability of the electrical system."

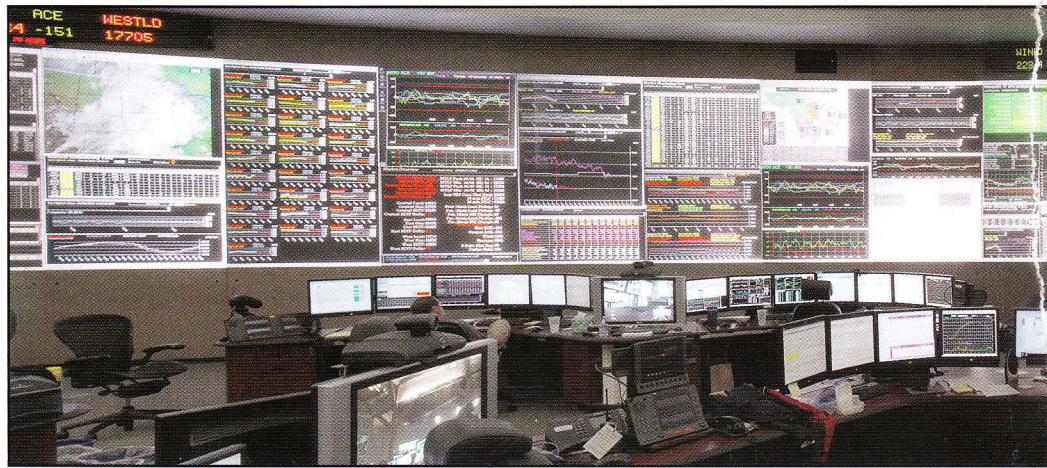
"Our goal is to provide reliable and efficient, low-cost energy to the approximately 42 million customers in our service area," says Marc Keyser, senior manager, Stockholder Affairs for MISO.

It's not a simple process. Unlike other sources of energy, electricity is the ultimate "just-in-time" deliverable. It can't be stored. It must be made (generated) as it is needed. Generate more, and you can potentially stress the system. Generate less, and you face an outage scenario. It's a delicate balancing act, matching supply and demand megawatt by megawatt.

Scope of responsibility

In December 2001 MISO received RTO approval from the Federal Energy Regulatory Commission (FERC), making it the first RTO in the nation. Currently John Bear serves as president and CEO and J. Michael Evans, chairman of the board.

How does an RTO operate? MISO is owned by Duke Energy, Indianapolis Power & Light, and other organizations which own



transmission lines—the big ones along the interstates; not the distribution lines that deliver electricity to your home. Non-owning members include utilities that need to purchase electricity and merchant operators (e.g. coal mines) who generate electricity. All members voluntarily give MISO the authority to coordinate, control and monitor the operation of the electrical system.

In return, MISO's 391 participants receive benefits that result in substantial savings: From 2007 through 2011 cumulative stakeholder savings were between \$4.3 and \$5.7 billion.

The footprint of the 501(c)(4), non-profit organization has grown to 15 states located in the Central, North and South Regions of the United States, plus the Canadian province of Manitoba. The Central and South Regions are controlled by MISO's Carmel headquarters, while MISO's Eagan, Minnesota control center oversees the North Region and the province of Manitoba.

MISO is the recipient of six NERC "Examples of Excellence" industry awards and the highly coveted Franz Edelman Award for Excellence in Operations Research.

MISO's wholesale market model

All the action takes place in the control room. Here, MISO brings together all the wholesale participants in its footprint—the buyers (organizations that provide customers like you and me with electricity), the sellers (companies that generate electricity) and the transmission owners that own

the transmission lines the electricity flows across—to ensure reliability.

One wall of the huge room is covered with a multitude of ever-changing, color-coded screens representing power grids, specific regions, current wholesale pricing information, the frequency (or health) of transmission lines and much more. Lights flash, alarms go off and the screens update according to the latest data. It's like a mini

...electricity is the ultimate "just-in-time" deliverable.

New York Stock Exchange except the desks are manned by NAERC-certified (North American Electric Reliability Council) operators instead of stockbrokers. In the MISO marketplace there are two markets. The real-time market reacts immediately to current conditions. For example, if a transmission line connecting Indiana and Michigan suddenly goes out of service, it would be difficult to get energy into Michigan, so MISO would increase the price paid to generators of electricity in Michigan so the demand (or load) can be met.

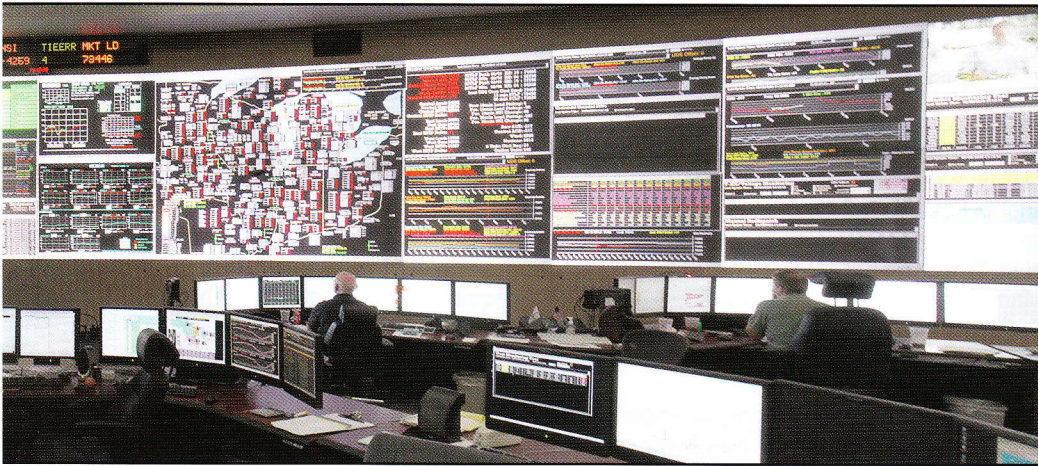
"We use the market to satisfy the reliability needs of the system," Keyser says. "And we do it efficiently, at the lowest cost to the consumer." With MISO providing and managing the market, pricing transactions are transparent to all market participants.



Events

By Shari Held
Photos courtesy
MISO

STRATEGIES TO MANAGE THE POWER GRID



The day-ahead market creates a financially binding market for the next day based on forecasts supplied from participants as well as its own research. Generators of electricity state the price at which they are willing to produce energy, and MISO selects the most economical set of resources to meet the anticipated demand, charging a very small per-megawatt transaction fee for its services.

Prices vary considerably depending upon the cost of generation and the cost of delivery. For example, it costs more to deliver electricity to rural areas than to urban areas.

While the control room is at the center of activity, many people contribute to its successful operation behind the scenes. MISO employs approximately 700 people—mainly in operations, engineering and IT functions. Many of them work on a shift rotation. A data backup satellite office is located in Sheridan.

“MISO is filled with people who are very passionate about what they do,” Keyser says. “They are interested in doing the right thing—getting electricity to the right place and helping satisfy customer demand as efficiently as possible.”

Planning for the future

Besides reliability, MISO’s other primary function is long-term transmission planning. It is another balancing act.

“The cost to deliver energy to a different location in our footprint is very dependent

upon how much transmission is available to take energy to that spot,” Keyser says. “If you try to flow too much electricity through a small transmission line, that line will heat up and potentially burn down. We need to plan the right transmission model so we’re not spending too much money on building transmission, but we can get energy from the generator to the load.”

Building a transmission line can take five years or more, so planning needs to be done for five, 10 and 20 years in advance. Coordinated regional planning requires negotiations and buy-in on a state-by-state basis.

One owner’s perspective

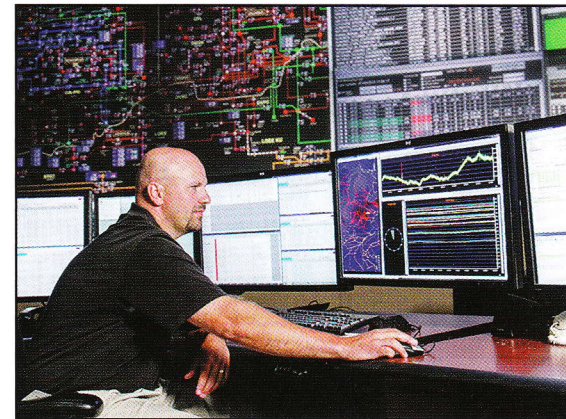
NIPSCO (Northern Indiana Public Service Company), a transmission-owning member of MISO, turned functional control of its transmission assets to MISO. “We still own the assets,” says Bill SeDoris, director MISO integration for NIPSCO. “We still generate revenue off those assets. We still maintain them. But MISO gets to direct who runs the traffic on those transmission lines.”

Before joining MISO, NIPSCO performed all those functions itself, but now benefits from the economies of scale MISO membership provides. For one thing, members don’t have to shoulder the burden of carrying substantial reserves (i.e. paying generation owners to hold space in their generation facilities) to “chase the load” (react to changes in demand) or to recover from a disturbance such as a generation malfunction.

NIPSCO serves a very large industrial customer base. On a typical day, NIPSCO’s demand is around 2,500 megawatts, and its large industrial customers can fluctuate 300 to 600 megawatts at any time. If NIPSCO only served residential customers, its reserve requirement to follow changes in demand would be around 1 percent or 25 megawatts. However, because of these demand swings from its industrial customers, NIPSCO often had to carry reserves in the 150- to 200-megawatt range. “For a utility of our size, that was a very big burden to handle independently,” SeDoris says. “Under MISO, the footprint itself can absorb those large swings, and now we benefit from only needing to carry a 10-15 megawatt reserve to follow our demand changes.”

During sweltering summer conditions MISO protects NIPSCO customers from potential blackouts by reaching out to its North Region footprint to obtain energy to keep NIPSCO customers cool.

In addition, NIPSCO no longer has to shop around for power. Every five minutes MISO checks to ensure that energy needs are being met at the lowest cost within its system. “We know we are always getting the best possible price,” SeDoris says. “And when we are selling, MISO opens up more opportunities in the market for us.”



MISO oversees the big picture of the electrical needs and capabilities of the members it serves, down to knowing when each member plans to go offline for maintenance. If other members are under stress conditions, MISO can halt NIPSCO’s transmission maintenance to ensure the system as a whole is reliable.

“MISO can see and address problems before they even get down to the lower levels,” SeDoris says. [HCBM](#)