

# Hub of Cooperative Energy

Twelve system operators work rotating shifts around the clock at Cooperative Energy's Control Center to coordinate the convergence of the Cooperative's generation and transmission functions. Maintaining safe, reliable electric service to our Members' end users is the goal. The task of successfully achieving that goal is rigorous, ever-changing, and never-ending for these twelve operators and their four-person leadership team.

A wall of monitors is at the front of the Control Center, each screen providing system operators with a different real-time snapshot of the Cooperative's generation and transmission system, maps, and data. Stationed before that wall are four desks, each sporting their own collection of monitors. The individual desks represent a different core Control Center function: Energy Management System (EMS), reliability, coordinator, and training. System operators work the EMS and reliability desks 24 hours a day. The coordinator and training desks are staffed during standard business hours Monday through Friday.

The operator assigned to the EMS desk coordinates generation functions, such as scheduling units, and ramping units up or down. The operator assigned to the reliability desk coordinates transmission functions, such as switching, controlling voltage, and monitoring the system for outages. The coordinator desk operator monitors control system communications and data while backing up the EMS and reliability desks as necessary. "At these desks, we get to see

the entire process from the generator to the meter," said Brad Pickett, training and operations coordinator.

As continuing education is a core component of working in the Control Center, system operators are scheduled to participate in an education module at the training desk when available, also providing EMS and reliability backup as needed.

The operators focus on a large number of items daily as they keep the system operating in a safe, reliable manner. Each operator is expected to know and respect the established limits of the generation and transmission equipment; know how to implement MISO's operating instructions such as starting and stopping generation units; monitor Cooperative Energy's on-system transmission and Member delivery points served by the transmission systems of Entergy Mississippi and Mississippi Power Company; and ensure overall system reliability.

"The operators at these desks also work with our (Cooperative Energy) communications team, substation, line, and relay crews daily to assist them with their jobs," said Steve Mauldin, system operations supervisor. "They perform 90 switching procedures on average per month," said Mauldin. These switching procedures are regimented processes to assure that all steps are followed in the proper order so that equipment is de-energized or otherwise safely prepared for maintenance and other work.

MISO, the Midcontinent Independent System Operator, ushered in a new era for Control Center operations when Cooperative Energy joined the regional transmission operator on December 18, 2013. At 11 p.m. that evening, system operators transitioned from controlling the generation and transmission system independently and working as its own balancing authority to working with MISO to operate Cooperative Energy's system as one portion of the larger MISO Balancing Authority.

"Now that we are in MISO, we constantly monitor real-time locational marginal pricing (LMP) and what MISO is charging us for load," said Jay Fairley, system operator. "If we have the opportunity to buy supplemental power (at a better price), then we are maximizing our resources and hedging against (high) MISO LMPs. This is tedious because the LMPs change every five minutes."

"Overall, we have been successful with this," said Pickett. "System operators are responsible for maximizing our position in the MISO market. Any spikes in the real-time price can have significant financial impact depending on how we are performing at that moment in time. Our operators make sure we do in real-time what we said we were going to do in the day ahead. Our operators monitor the real-time operations and act as our first line of defense. They must know the characteristics of our generators, such as when to duct fire our combined cycle units. All of this is triggered by our operators' knowledge of the system and knowledge of the MISO market."

This knowledge is acquired through experience and a constant training regimen. Earning the opportunity to serve as a system operator requires individuals who are journeyman level or higher in their related field of expertise with a minimum of five years of experience in power production or the transmission field. Candidates must then pass an entrance exam before they are eligible for hire.

Once selected, candidates train for a minimum of six months (on average seven to eight months) to prepare for the required North American Electric Reliability Corporation (NERC) certification exam before they are eligible to work independently. Training includes in-house curriculum focused on policies and procedures, power system fundamentals, reliability related tasks, and on-the-job

exercises. Throughout the initial training phase, operators-in-training are evaluated on weekly goals and objectives to ensure that the training is effective.

Once the training is complete, trainees are assessed for their readiness and ultimately released to take the 150-question NERC exam, which lasts a maximum of three hours.

Operators-in-training must achieve NERC certification and then pass an in-house “Go/No Go” evaluation before they are released to work on a desk. “We work with each person to make sure they are prepared,” said Joe Riels,

may fill the role of a system operator at any time. These 200 hours are achieved through conferences, computer training, and internal classroom training. Additional training applicable to the NERC requirement is conducted through SERC Reliability Corporation, MISO, and ACES, Cooperative Energy’s wholesale energy trading and risk management firm.

Cooperative Energy currently conducts 36 hours of internal training annually across three training cycles in order to reach all operators. NERC’s continuing education requirements and approved topics serve as the foundation for the in-

so we are the first responders to many situations.

When things go wrong, especially for our Members, we are generally the first to know, so we try to help address those problems.”

“We have years of experience (operating the system) as a company, but new situations arise all of the time,” said Fairley. “It is a dynamic environment.”

“The Control Center is an ever-changing environment,” said Pat Simmons, lead system operator. “During the 13 years I have been in the Control Center, I can never remember a time when we were not implementing something new. Whether it be energizing a newly constructed line, substation, or joining an RTO (regional transmission organization) such as MISO.”

Composure and the ability to communicate clearly are also crucial to success in the Control Center. “We never know who is calling,” said Riels. “It could be a coworker or the CEO of one of our Member systems, or even a high-bill complaint after hours. Our system operators represent our entire company when calls come in, and how they handle these calls is a reflection on the organization.

“In the Control Center, we get to see the entire picture of the company,” said Riels. “We get to see all the puzzle pieces fit together, whereas most employees only get to see one piece at a time.”

As the name implies, the Control Center, the system operators, and their leadership staff are at the hub of Cooperative Energy’s operations.



*Cooperative Energy’s Control Center.*

system operations manager.

Upon successful completion of the test and a “Go” at the conclusion of the evaluation, the new operator moves into a shift position and immediately transitions into a career-long continuing education regimen.

“Training is continuous,” said Pickett. “You enter a training program on day one and never leave it.”

All certified operators are required to complete 200 hours of training over a three-year period to maintain NERC certification. This requirement extends beyond the system operators to include the leadership staff—system operations manager, system operations supervisor, lead system operator, and training and operations coordinator—all of whom

internal training. Cooperative Energy’s operators’ specific training needs are then determined and objectives are written based on those needs and the required NERC standards. Pickett then works with in-house subject matter experts to develop and implement the training and assess the acquired knowledge in order to prove competency to NERC.

Not all system operator skills are acquired, however; quick thinking, sound judgment, and a host of other traits benefit Control Center employees.

“Operators need to be people who can transition from calm to emergency mode in a moment and keep calm and focused,” said Riels. “We are often the first to know when all of the pieces of the puzzle are not working in harmony,

