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Changes for the Better

CASE STUDY
MARIETTA POWER, GEORGIA

The Heartbeat of the City

How an award-winning municipal utility runs its control room

You don't have to be big to provide great service.

At least that's the case at Marietta Power, a municipal utility that has, for three consecutive multi-year series, won the American Public Power Association's prestigious RP3® award (for Reliable Public Power Provider).*

"It's all about power restoration," explains Jim Culpepper, Supervisor of the utility's Power Control Center. "The faster we can restore power the better it is for our customers and for us." He says the city is nationally known for its average power restoration time, and that low number has been a big part of its ability to win the RP3 award so consistently.

Still, the utility is not content to rest on its laurels. In an effort to further improve its service, Marietta Power recently installed a state-of-the-art Mitsubishi display wall powered by Activu software.

Keeping the lights on

Culpepper says that the utility, owned by the City of Marietta, Georgia, has worked hard to make sure the technology it uses is second to none. "With 46,000 customers, we're not nearly as large as a Georgia Power, but we are at least as state of the art."

For example, Marietta Power is looking to install Fault Detection, Isolation, Restoration (FDIR), so that when an outage occurs, the system automatically reroutes power to minimize downtime for customers.

The city's electric system includes 21 substations, with 69 high voltage feeder lines taking power to the transformers that serve individual customers. "Every feed line is looped, so that if something happens to one line, we can feed you from another direction," Culpepper says. Roughly 76% of its customers are residential and 14% are commercial with a 10% mix of business, manufacturing, schools and government.

Major power outages are quickly restored with the city's ACS Prism SCADA (Supervisory Control and Data Acquisition) system that gives technicians working in the Power Control Center the ability to operate all of the city's electric and water systems with the click of a mouse.

"The display wall is truly a mission-critical system at Marietta Power," says Gary Werner, Director of the Display Wall Group at Mitsubishi. "It's absolutely crucial that technicians can quickly and clearly see exactly what's going on throughout the city, especially if there's an emergency."

For example, Culpepper explains that "We had a major fire in an industrial plant back in May. The fire department asked us to de-energize the lines feeding the plant. We were able to open a breaker to do that from the control room, while at the same time rerouting the feeds to minimize the number of customers affected by the outage."

The water system includes two 500,000 gallon above-ground water tanks plus three pumping stations and a wet well station also operated from the same control room. The technicians who monitor the power and water operate the SCADA system and dispatch and track the crews who repair damaged lines. “I don’t believe in specialization within the control room,” Culpepper says. “Our people are fully cross-trained and have access to all operations. We never have to wait to act because someone’s out to lunch or someone can’t log into a critical system.”

The control room also monitors and operates the city’s internal fiber optic computer network and the Board of Lights and Water internal security and surveillance systems. Technicians monitor local and national weather as well, and the utility subscribes to Schneider Electric Doppler radar services, to better anticipate storms that may affect its service area. “From lightning strikes to ice storms or hurricanes in the Gulf of Mexico, this radar system allows us to keep an eye on anything that is a potential threat to our system,” Culpepper says.

“It’s true that we can’t do anything to affect these storms,” he adds, “but we can be ready for them and the damage they are likely to do.” The city has 260 miles of overhead power lines, but Marietta Power has been investing in underground distribution as well, with 331 additional miles now below grade, where they cannot be damaged by bad weather or fallen trees.

A new control room

In an effort to further improve system operations, Culpepper and his staff began planning a new control room about two years ago. “We did some window shopping at General Electric and at a number of other utilities,” he says, “then we focused on those systems we were most impressed with.”

They began working with Mark Dunlap, Utility Market Manager for Activu Corporation, a technology integrator that specializes in visualization solutions for control centers. Dunlap recommended a new display wall using eight 67” Mitsubishi SXGA+ projection cubes powered by Activu software installed on an HP server. The display wall provides a single, 7’ high by 18’ wide image with 5600 x 2100 resolution, onto which technicians can send any number of data windows in a wide range of layouts. In addition, Activu installed four Mitsubishi 55” flat panels (two on each side of the wall) to show less critical information.

Up to five technicians can man the new control room, each with their own computer workstation on a motorized sit/stand desk.

About half of the display wall is normally devoted to the city’s outage management system. “It looks like a Google map showing the entire city,” Culpepper explains. “All of the electrical lines show up in different colors, and we can see the service drops from the poles and the transformers going to the homes. We can pull up anything we need—the transformer numbers, their locations, the locations of our trucks, the names of our customers and data about them.”

The map is extremely detailed. Operators can zoom out to see the entire city or zoom in on one house. “On one layer of the map, we have symbols such as a red cross, so that we can see that one of our residents, for example, has health issues. If there’s an outage affecting that house, we know we have to give it priority or send someone out to make sure they get their oxygen.”

On the top left side of the data wall, technicians monitor the weather channels and weather data; on the bottom left the SCADA water system. On the top right, there are nine scrolling images of the city’s security cameras; on the bottom right the city’s fiber loop. The four flat-panel displays allow technicians to monitor, system status, news and weather and a feed from MEAG Power, where Marietta buys its electricity. A SMART interactive touch display makes it easy to fill out and send work orders.

“One purpose of the Activu software is to create a common operational picture, so that people in the Power Control Center can monitor those data points important to them at the time,” Dunlap explains. “For example, if the weather is not important, it’s minimized on the top left, but if there’s a storm or a lightning strike, it might take up 50% of the display wall.”

The Activu software also expands situational awareness by making it easy to send appropriate parts of the overall image to those who need to see them.

For example, there’s a conference room adjoining the control room where the mayor and city council can come in and monitor the control room without disturbing the technicians. “They have a 5’ by 10’ window overlooking the control room, and also a SMART touch display where they can bring up any view they might need.” Culpepper can do the same from his office.

A dramatic improvement

Culpepper says the new Mitsubishi display wall is dramatically better than the older one it replaced, which the city had purchased from another very large producer of projection cubes. “We bought what was state of the art at the time,” he explains, “but the difference is like comparing a new flat panel and your old TV; you can see now how dark and grainy it used to be.”

In addition, he adds, the old projection cubes used lamps as their light source, while the new have LED light engines which never need to be replaced. “We had nine screens and each had two bulbs which cost $600 apiece. They had to be replaced every year. You can see how expensive that was.”

The worst problem was that the manufacturer of the original display wall stopped supporting the projection cubes and provided no upgrade path. “With Mitsubishi, you can always purchase a new optical engine and keep the rest of the wall intact,” Werner explains.

“Obviously everything quits at some point,” Culpepper adds. “But the great thing about our new setup is that, if something goes wrong, it’s an easy fix. If a Mitsubishi cube goes down, we can open the back, pull out the light engine and slide in a new one, and we’re back in business.” The color, brightness and focus all adjust automatically. “With the old wall, that was supposed to be what would happen, but in reality we could be down for a long time.”

“Another advantage of the Mitsubishi cubes,” adds Werner, “is that they have the longest lifetime in the industry – up to 100,000 hours, or over 11 years running 24/7. That’s about 25% longer than any other display wall available, and without any required maintenance.”

Culpepper says he was especially impressed with how quickly the installation was completed. “Activu and their guys had a very short window to put it in and get it right. I was very impressed with their work.”

Today, the display wall is working flawlessly. That’s crucial, Culpepper adds, because “the Power Control Center is literally the heartbeat for electricity throughout the city.”

* The award measures four important criteria for the well-run electric utility. which include: System Improvement, Reliability, Safety and Workforce Development. The program awards three levels of attainment. A score between 80 and 90 is Gold while 90 to 98 is Platinum. The highest award is Diamond which requires a score of 99-100.

Marietta was the first Electric City in the State of Georgia to apply for and win this award for 2010-2012 with a Platinum level score. With reapplication for 2012-2014 the utility was again awarded a Platinum level score. In 2014 the award time frame was changed to a three year period and upon application review Marietta Power was awarded the Diamond Level for 2014-2017. This reflects the continuous improvement philosophy that is an important facet of the organizational fabric.