

## MEET WESTERN CUSTOMER WELLTON-MOHAWK IRRIGATION AND DRAINAGE DISTRICT

**EDITOR'S NOTE:** Every Western customer is unique, but they also share many circumstances and characteristics. Profile stories highlight the strengths, challenges, programs and operational and planning strategies our customers use to "keep the lights on." We encourage utilities to recognize the issues they have in common and to swap ideas and ask each other questions. If you would like to see your utility featured, contact the *Energy Services Bulletin* editor.

Small but complex, Wellton-Mohawk Irrigation and Drainage District (WMIDD) is vitally important to its southwestern Arizona service territory as both a water and power provider.

The Arizona State Legislature created the combination reclamation project/electric utility in 1951 to repay the construction costs of the irrigation and power systems, and to operate and maintain its facilities. The Desert Southwest region customer is governed by a nine-person board of directors elected by landowners living within its boundaries.



Agriculture is the leading industry in WMIDD's service territory, and lettuce is a principle- and thirsty-crop. (All photos by Wellton-Mohawk Irrigation and Drainage District)

### MAINTAINING LOW RATES

WMIDD serves about 3,500 customers, of which 81 percent are residential, 17 percent commercial and 2 percent agricultural. Agriculture is the region's leading industry, with the district providing irrigation for more than 62,000 acres of cropland. That leaves little private land in WMIDD's territory for expanding the local economy to offset losses caused by changes in the agriculture business. This scenario led to several years of a shrinking customer base and declining school enrollment, a common occurrence in many rural communities. The area has become a popular destination for retirees and "snow birds" fleeing cold winters, but the proportion of low-income customers remains high.

It is no wonder, then, that the district's highest priority is keeping its water and electricity rates affordable. "One of our customers' greatest concerns is just being able to pay their utility bills," confirmed Susan Lozier, WMIDD power procurement and marketing specialist.

Purchasing hydropower from Western helps WMIDD keep customers' rates low. Most of the district's generation comes from three hydroelectric dams on the Colorado River. Western also provides ancillary service support to WMIDD, coordinating supplemental power purchases, scheduling, regulating load and balancing energy delivery. "Western is instrumental in all our

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power dealings," Lozier observed. "Our hydropower generation is the district's most important power asset."

Promoting efficiency Load management is not a high priority for WMIDD, and resources for developing customer programs are limited. Nevertheless, the district has found ways to encourage customers to control their energy consumption.

Air conditioning represents a big opportunity for energy savings to the summer-peaking utility. WMIDD, through its Wellton-Mohawk Co-op, stocks air conditioners with a 13 or higher seasonal energy efficiency ratio, or SEER, rating for resale to customers at cost, plus a small handling charge. Customers are responsible for installing the units, although some local technicians do installations. "The local contractor pool is pretty small," Lozier explained. "There are more contractors in Yuma, but the city is 30 miles away with a mountain range in between. They aren't going to travel that far to do one installation, unless they sell the unit also."

Other measures WMIDD takes to save energy include replacing mercury vapor dusk-to-dawn lighting in public spaces with high-pressure sodium lamps and doing annual infrared inspections of its distribution system. The practice of level-



WMIDD Pumping Plant #2 is part of a vast irrigation system that supplies water to 62,000 acres of cropland.

ing crop fields using laser technology reduces the need for pumping, saving both water and energy.

Simply reminding customers of tried-and-true energy-saving tips can be an effective load-management strategy and here, again, Western can help small utilities like WMIDD. Lozier has used the Energy Services Easy Ways to Save Energy bookmark as a bill stuffer. Our graphics department set up artwork with the district's logo that could be printed and cut right in the office. This year, at Lozier's request, we turned our cooling maintenance tip sheet into a bill stuffer to help WMIDD customers make sure their air conditioners are ready for the hot weather.

Water in a dry land Electricity is only half of WMIDD's story, of course—the district has approximately 378 miles of main canals, lateral canals and return-flow channels to irrigate prime and unique farmland. The system includes three major pumping plants and four minor pump stations, 10 side delivery pumps dispersed along main and lateral canals, 90 drainage wells and about 300 observation wells. WMIDD also provides water to several small communities through public, private, municipal and domestic distribution systems.

The area's principal crops include alfalfa, grains, cotton, fruits and vegetables and specialty seeds. Wellton-Mohawk customers grow most of the

world's supply of registered Bermuda grass seed. The widely used grass is highly salt tolerant, and was a mainstay for local farmers from 1940 to 1952 when well water grew increasingly saline.

Water salinity is an ongoing issue WMIDD has dealt with since its inception. The district shares the waters of the Colorado River with many jurisdictions, as well as Mexico. The farther a river flows from its heading, the more saline it becomes naturally, and diverting water for other uses increases the salinity even more. The district has been a party to many international agreements and construction projects throughout the decades aimed at improving or maintaining the water quality of Mexico's share. Working with growers and the Bureau of Reclamation to adopt best land-use and irrigation practices also helps to reduce the salinity of Wellton-Mohawk's return flow.

Add in vegetation management and flood protection activities, and it is clear that the work of a desert-region water reclamation project located along an international boundary is never done. Western salutes this small, but hard-working, multi-tasking agency. Wellton-Mohawk Irrigation and Drainage District plays a critical role, not only in its community, but also in the vitality of the entire region, and knowing we support such customers gives meaning to our work. ⚡

## ENERGY SERVICES BULLETIN

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# STEARNS ELECTRIC CREW BRAVES COLD, INSPECTS DISTRIBUTION SYSTEM

All photos by Stearns Electric Association.

Western customers are the best when it comes to keeping the lights on, rain or shine, as the Stearns Electric Association maintenance crew demonstrates.

Each winter, Operations and Maintenance Supervisor Glen Kemper borrows an infrared (IR) camera from our Equipment Loan Program and leads his crew on an inspection of one-fifth of the cooperative's distribution system. January may not seem like the ideal time to be doing outdoor maintenance in central Minnesota, but, "That's when the crews are free," acknowledged Kemper.

The Rural Utility Service and National Electric Safety Code requires that Stearns inspect its underground

system regularly, a practice that gives the utility a chance to find and repair deteriorated connections that could cause outages if they failed. Kemper chose the Flir E60 for this year's inspection because it is lightweight and easy to use. "And you don't have to look through the viewfinder," he added.

"The viewing screen on the Flir E60 can be manipulated so you can see it from different angles," explained Gary Hoffmann, program manager for Western's Equipment Loan Program. "The camera is WiFi-enabled too, so users can see the image on their pads or smartphones."

Those features allow the crew to set up shots in the tight spaces of the junction boxes and take a few quick shots of "elbow" connectors that terminate the energized conductors. "Then we close up the box and move on to the next one. It takes less than a minute, so we aren't exposed to the elements for that long," Kemper pointed out. "Except for the cold weather, it's a piece of cake."

A good thing, too, since the temperature hit a low of 15 below zero

with 20 mph winds during the most recent inspection. One picture of a hot connection in a three-phase module shows a temperature range of minus 6 degrees for the hottest spot, where the connection has deteriorated, to 40 below for the coldest spot. "That low temperature might be a reflection of an object rather than the actual object, but it is all cold," declared Hoffmann.

The inspection turned up about a dozen elbows or three-point connectors that needed to be replaced. Kemper noted, "Typically, there is a lot of heat load on the system in the winter, so it is easier to see where the problems are."

In addition to regularly borrowing IR cameras from the Equipment Loan Program, Stearns also borrowed the fuel cell demonstration kit. "We set up at an annual member meeting," Kemper recalled. He added that the staff experimented with the educational display in the office too, but the co-op has no plans at this time to add fuel cell generation to its mix.

The distribution cooperative will continue to borrow the cameras for its annual system inspection and other maintenance projects, however. Members rely on Stearns Electric to keep their homes comfortable throughout the year, and Kemper knows he can rely on Western's Equipment Loan Program to provide specialized tools to keep his system in good repair. ⚡



This infrared photo reveals the excess heat coming from a loose elbow connection. If the connection was allowed to burn through completely, all Stearns members served by that connection would lose power.



This failing elbow arrester was one of several the maintenance crew found and replaced during their inspection. Elbow arresters dissipate excess voltage, typically caused by lightning strikes, before the surge reaches a customer's home where it might damage electric appliances.



Junction boxes house energized conductors, which provide above-ground access points to the underground electrical distribution system. Stearns maintenance crews often have to dig the boxes out of the snow to perform their annual IR inspections.



## AROUND THE WEB

### APPLIANCE STANDARDS AWARENESS PROJECT

Customer efficiency programs built around home appliances benefit both utilities and ratepayers, but keeping up with the latest technologies and standards can seem like a full-time job. Fortunately for utility program managers, there is the Appliance Standards Awareness Project (ASAP) to make the task easier.

Over the long term, highly efficient appliances are a valuable tool for keeping electricity rates stable by controlling load growth. Raising the efficiency standards for commonly used household appliances can also help to drive down climate-changing pollution while saving Americans billions of dollars annually in electricity costs.

Recognizing the need for more effective standards, the American Council for an Energy-Efficient Economy (ACEEE), Alliance to Save Energy, Energy Foundation and Natural Resources Defense Council (NRDC) created ASAP in 1999. The coalition spearheads a broad-based effort to advance, win and defend new appliance, equipment and lighting standards. The ASAP steering committee includes representatives from energy and water efficiency organizations, the environmental community, consumer groups, utilities and state government.

#### STANDARDS CORRALLED

Whether you are planning a new incentive program or answering a customer's question about efficient equipment and appliances, ASAP's product table is the resource to bookmark.



Products are categorized as residential, commercial/industrial or lighting. Visitors can see at a glance when the last standard for an appliance was issued, the date the standard took effect, anticipated updates and which states have their own standard for that appliance. Each product is linked to a page describing the appliance and standard in detail and giving key facts about what the standard is intended to accomplish. Water conservation standards are also listed where applicable.

#### WHYS, WHENS, WHERE'S, HOWS

ASAP is loaded with resources that can help you persuade supervisors that an appliance rebate program is a good idea, or assist with evaluating an existing program.

Refer your board of directors—or curious customers—to The Basics to educate them on what appliance standards are, how they are developed and what they cover. DOE Rulemaking 101 is a useful overview of the Department of Energy process for setting standards. Given the industry's stake in efficiency standards, utilities should understand rulemaking so they can provide input. FAQs and a scenario that imagines no appliance standards wrap up the primer on the importance of efficiency standards.

ASAP can help you sort out the sometimes-confusing differences between national and state standards.

National standards apply to products manufactured or imported for sale into the U.S., while state standards apply to products sold or installed in a specific state. DOE reviews and updates national standards to keep pace with advancing technology, but states frequently take the lead in setting new standards (California, we are looking at you!) Visitors will find resources related to DOE rulemaking, laws and regulations on the national page, and current and historic state standards on the state page. An interactive map allows you to download a report on how national standards have benefited each state.

#### AND THAT AIN'T ALL...

Wrap up your research with a visit to Reports and Resources, where you will find fact sheets, consensus agreements for new national standards, comment filings, testimony, and laws and regulations. Links can put you in touch with other organizations that can help you navigate codes and standards nationally and regionally. ⚡



## TECHNOLOGY SPOTLIGHT:

# ACHIEVING DATA CENTER EFFICIENCY

**D**ata centers use only about 2 percent of the nation's electricity, yet they are responsible for processing and storing enormous volumes of data.

Such a modest figure might lead utility efficiency managers to wonder, "Why should I care about data center efficiency?" Here are a few reasons why data center efficiency matters:

- The amount of data we process is growing exponentially. As that volume increases, so will the number of data centers and their percentage of our electrical load. Nationwide, data center energy use grew by 200 percent from 2000 to 2005, and another 36 percent from 2006 to 2010. Though it is difficult to project into the future, data centers could easily comprise 5 percent of the electrical load by 2020.
- The data industry is still relatively new, so utilities have a window of opportunity to encourage these businesses to make energy-efficiency practices standard operating procedure. More than 100 forward-thinking utilities nationwide have launched efficiency programs for data centers. Many data centers are proactively embracing energy management plans to control costs.
- Energy use in a data center can be 50 times higher than in the rest of a commercial building. Data centers typically take up less floor space than other types of businesses, but they can account for 40 to 60 percent of the building's total electricity use. That gives utilities a motivated audience for efficiency programs. Also,



Air-side economizers use up to 100 percent outside air cooling capability in a data center to provide "free" cooling. Because data centers require cooled air year-round, these units can deliver significant energy savings. (Photo by Emerging Energy Efficiency Technologies)

projects that enhance data center energy efficiency and promise a good return on investment are still relatively low-hanging fruit.

### WATCH THE AIRFLOW

Contrary to popular belief, information technology (IT) equipment can stand a surprisingly wide range of temperatures and humidity. In

2008, ASHRAE (the American Society of Heating, Refrigerating and Air-Conditioning Engineers) established new recommended temperature and humidity ranges at the inlet of the server. "Cold aisle" temperatures can be as high as 85 degrees, and even tolerate above 100 degrees for limited periods. In many climates, it

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**HOT AISLE/COLD AISLE** is a layout design for server racks and other computing equipment in a data center. The configuration is intended to conserve energy and lower cooling costs by managing air flow.

The simplest form of hot aisle/cold aisle design involves lining up server racks in alternating rows, with cold air intakes facing one way and hot air exhausts facing the other. Rows composed of rack fronts are called cold aisles, and typically face air conditioner output ducts. Hot aisles are the rows that heated exhausts pour into. These usually face air conditioner return ducts.

is possible to use only outside air for cooling most or all of the time.

There are several steps IT managers can take to make hardware and networks operate more efficiently:

- Use outside air (airside economizers) to cool and manage airflow—In some climates, this strategy can save as much as 60 percent of cooling energy, according to guidelines published by Pacific Gas & Electric. However, since retrofitting an airside economizer is often cost-prohibitive, this is a better choice for new data centers or major remodels. For best results, the data center should be located on an outside wall or top floor to reduce the ducting required. Regular maintenance is a must for keeping the economizer in good working order, and continuous commissioning is the most effective strategy.
- Fine-tune computer-room air conditioning (CRAC) units—To perform the tune-up, hire an HVAC engineering inspector who specializes in data centers. Optimize the CRAC unit's performance by removing any barriers to efficient airflow, sealing air leaks wherever practical and installing physical barriers to separate the hot and cold aisles.
- Use passive airflow management strategies—Recent advances in data center design allow passive airflow management. Optimizing Network Performance through Passive Air Flow Management in the Data Center, a presentation from the

2011 BICSI Summit, explains the design and operation requirements behind this strategy.

### PROMISING TECHNOLOGIES

Recently, the Washington State University Extension Energy Program convened a Technical Advisory Group (TAG) to advise Bonneville Power Administration on emerging technologies, or ETs, that could enhance energy-efficiency in data centers and other IT applications. The TAG identified 57 relevant ETs that managers should consider to improve the efficiency of their facilities. The nine ETs that have the greatest potential for improving data center efficiency are:

- Air-side economizer
- Airflow management
- Server virtualization
- High-efficiency uninterruptable power supplies (UPS)
- Ongoing commissioning of economizers
- Storage area network (SAN) and network core consolidation
- Power management for IT equipment
- Solid state drives (flash memory)
- Direct server cabinet cooling

### HANDS-ON APPROACH

Even the most advanced technologies and equipment will fall short of promised energy savings if the users are not committed to reducing their energy consumption.

Data center customers that are new to energy management may need technical assistance from their power providers to get their

programs started. Utilities can help in a number of ways, starting by talking to IT managers about the business case for energy efficiency and about specific energy-saving strategies. Listen as well, for clues that can help you craft customized recommendations for that particular data center.

Look for ways to make saving energy a higher priority for IT managers, who are often focused exclusively on data center reliability and performance. Building incentives for saving energy into the IT manager's compensation package is one example. Such strategies require that the company's management also understand the value of energy efficiency. The key account representative may want to meet with the senior and facility managers to discuss the importance of energy efficiency.

After the data center has established an efficiency program, schedule periodic evaluations to see if the company is meeting its goals. Most energy management plans need fine-tuning, especially early on. Such meetings are also an opportunity to share information about new technologies and measures for reducing energy use. As every utility program manager knows, energy-efficiency is a never-ending education. ⚡

# JOIN THE CROWD AT UTILITY ENERGY FORUM

MAY 14-16 TAHOE CITY, CALIF.

Judging from this year's high registration numbers, the 34th Utility Energy Forum is going to be a great place to meet and network with your colleagues from other western utilities and trade allies.

Utility professionals in marketing, planning, energy services and customer service will gather at Granlibakken Conference Center May 14-16, to explore strategies for creating successful load management programs.

Several Western customers are not only attending, they are also sponsoring the event. You will have the opportunity to learn how Riverside Public Utility, Roseville Electric, Sacramento Municipal Utility and others are leveraging consumer interest in energy efficiency and renewable energy to respond to our rapidly changing industry. Exhibitors from energy services and technology companies will introduce you to products and programs that can help your utility achieve its energy management goals.

The agenda is set up to examine how legislation and policy, customer demands and expectations and technology advancements affect utility programs and operations. Western Administrator Mark Gabriel will deliver the opening keynote address. Speakers from government facilities and agencies, energy consulting firms, univer-



Attendees at the 2013 Utility Energy Forum listen to a five-minute presentation during the Utility Program Stand-Up Challenge and Ice Cream Social. (Photo by RLMartin)

sities, businesses and nonprofit groups will provide insights from their unique perspectives.

Low-key, informal networking opportunities set the forum apart from other industry events, and there are plenty on offer. In addition to leisurely snack breaks and meals, attendees can network around the campfire or learn about utility-sponsored programs, speed-dating style—with ice cream. Cement new professional relationships at the ever-popular "Any Port in a Storm" port wine tasting, with live music.

The registration fee of \$795 for utility and government professionals covers two nights of standard lodging, all meals and receptions. Upgrades are

available if you want to bring a friend and stay an extra day to enjoy springtime in beautiful Lake Tahoe.

The Utility Energy Forum is an excellent investment in professional development for utility program managers. The things you learn, the people you meet and the ideas you hatch will pay off all year around. ⚡