

Issue Preview
August 2009

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Issue Topics

EMS / SCADA

Usual thoughts of Distribution Automation include visions of pole-mounted overhead circuits, with overhead switches and RTU's. However, back in 2006 NSTAR set out to introduce underground automation in its vast underground distribution system, located beneath the streets of Boston.

Substation Build

Nevada Electric has worked tirelessly to keep pace with Las Vegas' incredible growth. A new Sinatra 230/138/12 kV substation was recently commissioned with not one, but two separate gas insulated substations on a tiny 1.6-acre site. This project demonstrates how NVE is meeting new load challenges on the highly congested "Strip" while thinking ahead toward system reliability and flexibility.

Communications Systems

The City of Westerville, Ohio, has been a four-year recipient of the Reliable Public Power Provider quality designation by the American Public Power Association. They work to maintain this designation as one of the top 84 (out of 2000) municipal utilities in the country, even if it means exploring new technologies to do so. This has led to an interest in a system that claimed it could pre-empt and prevent outages by identifying distribution line equipment that is about to fail.

Work Management

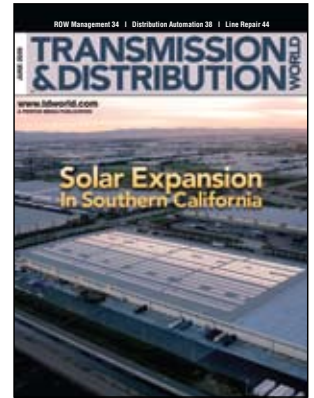
Until the late 1960s all energized work on electric installations was prohibited. Facilities had to have the supply disconnected and be earthed. Since then the Association for Medicine and Safety of the Electrical Industry contributed in an important way to achieve acceptance of live-working procedures. Additionally, in 1990 the Polytechnic University of Madrid started development of a tele-operated system for line maintenance.

Meter Infrastructure

Smart meters, smart homes and the smart grid are all on the way. The common goal of these "smart" technologies is making life easier for consumers. But, do they really lead to smarter consumers? San Diego Gas & Electric is positioning itself as one of the first U.S. utilities to show consumers the benefits of smart meters: greater choice, control and convenience.

Overhead Facilities

To minimize the investment required to maintain the voltage within specified limits, particularly on LV networks in sparsely populated areas, EDF is installing innovative hardware. The hardware is designed to reduce the voltage drop between the LV feeder source and the remote end of the circuit which offers a cheaper alternative to the traditional methods of network reinforcement.



Columns in Every Issue

Each month, more than 52,000 subscribers¹ turn to *Transmission & Distribution World* magazine for the latest news, technology, automation developments, new product updates and more.

GlobalVIEWPOINT

CTOs Revisited

LAST MONTH, I REPORTED ON DAVE MOHLER'S ROLE AS CHIEF TECHNOLOGY OFFICER (CTO) at Duke Energy. Mohler stressed the need for an executive focus on emerging technologies as we strive to address increasingly complex energy issues. This month, I'm reporting on the "big picture" activities ongoing at Hawaiian Electric Co., as shared by CTO Karl Stahlkopf.

Stahlkopf tells me our industry is in the midst of one of the largest transitions ever with billions-dollar bets being made on technology, requiring such issues as energy security and greenhouse gas emissions.

Stahlkopf is a natural for the CTO position at Hawaiian Electric, having served previously as vice president of power delivery at the Electric Power Research Institute, where he coordinated closely with North American and international utilities, the Department of Energy and the vendor community.

Stahlkopf provided me a window to look into the role of the CTO, stating, "I report directly to the CEO to get initiatives in place, funded and implemented. My duties include working closely with the public utility commissions, setting time frames, evaluating skill levels and, of course, performing the technology leadership function." Stahlkopf discusses the president of Hawaiian Electric's renewable energy subsidiary, while maintaining responsibility for demand-side management, energy efficiency and intelligent metering activities.

Stahlkopf also works closely with Rick Soffer, chief information officer. Most recently, they collaborated in all aspects of rolling out Hawaiian Electric's broadband communications infrastructure. On the delivery side, as a part of its intelligent grid initiative, the company has integrated fused circuit breakers and capacitor switches into the distribution system.

RENEWABLE GENERATION

Hawaiian Electric is now under way to meet its 20% renewable generation by 2020. Gov. Linda Lingle is pushing even harder, expecting the desire to be 20% renewable by 2030. The governor's office is working collaboratively with Hawaiian Electric and the Department of Energy in an attempt to meet these increasingly aggressive renewable targets.

On the Big Island of Hawaii, wind regimes are extremely robust with 7,000+ hours per year. Hawaiian Electric already has 30% wind generation, which "makes the grid behave sometimes like a bucking bronco," states Stahlkopf.

It recalled that the utility had installed a device called the electronic shock absorber (ESA) on the Big Island several years ago to mitigate wind-generated induced voltage swings and inhibit the status. Stahlkopf told me one such device rendered the ESA nonfunctional but the device had performed as intended. I was surprised to learn Stahlkopf holds the device's patent, which is licensed to S&C. Stahlkopf says Hawaiian Electric intends to install more devices like the ESA as the renewable component of generation increases and the difficulties of handling intermittent and highly variable generation increase.

Stahlkopf was advanced metering infrastructure (AMI) as key for Hawaiian Electric. If it is to take advantage of demand response and time-of-use opportunities. According to Stahlkopf, Hawaiian Electric already has a large conventional water heater and air conditioning program tied to its AMI system. Hawaiian Electric has AMI installed at 750,000 homes and businesses. Between 2009 and 2011, it will be installing intelligent two-way metering for all Oahu customers enabling it to monitor customer energy use in 15-minute increments.

ENVIRONMENTAL ISSUES TO THE FORE

Heavy on Stahlkopf's mind is the intermittent nature of renewables, which requires energy-storage solutions. Hawaiian Electric is presently evaluating sub-sea pumped storage as well as large battery-storage options. However, no clear winner has emerged. Hawaiian Electric also is looking at tapping into ocean swells as an energy source for the island of Maui.

"Because the majority of Hawaiian Electric's generation is offshore combustion turbines and diesel engines," states Stahlkopf, "our utility is looking to build hydroelectric plants. With all of this in hand, we want to diversify from the oil market by getting a selling agreement where the price we pay for hydro is linked to a variable oil index."

Asked his thoughts about electric vehicles, Stahlkopf states, "Plug-in hybrid vehicles have tremendous potential to handle the typical commute of under 40 miles. And with AMI in place, utilities will have the opportunity to sell off-peak electricity at attractive rates in effect, putting them in the transportation business."

As Mohler and Stahlkopf are demonstrating, we can better tackle our industry's biggest issues with technical representation at the highest executive levels.

Rick Bush
Editorial Director

Editor's note: Karl Stahlkopf would like to share insights with fellow CTOs. He can be reached at kstahlkopf@hawaii.com.

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¹December 2008 BPA Circulation Statement.
²Publisher's Own Data - April 2008

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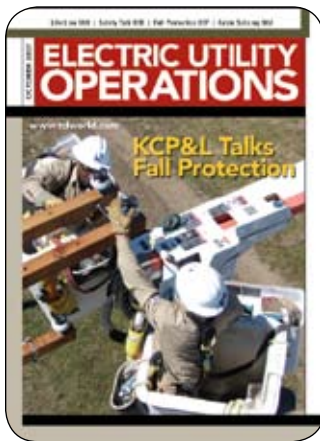
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