

## Issue Preview April 2010

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## Issue Topics

### IT / Automation

Over the past 10 to 15 years, utilities have seen tremendous growth in the number of smart relays and other smart substation devices. While these devices provide traditional SCADA data, they also offer data that can improve the planning, operations, and maintenance of assets. As a result, Southern Company has embarked on the Field Data Historian pilot: an effort to identify technology solutions to support the collection and storage of this data.

### Grid Design

Satisfying the increasing and future energy demand in major cities often requires a re-organization of the existing electricity supply system. In Spain, there is intense debate on the perceived adverse health effects from electro-magnetic fields and aversion to transmission towers. These considerations led to the decision to bury the existing HV and MV overhead lines and redesign the electricity transmission system and distribution network in the City of Madrid.

### Equipment Security

As copper prices plunged in late 2008, copper theft was all but eliminated at many utilities. However, recently utilities have seen a resurgence in copper thefts that parallels the recovering commodity markets. This article recounts how Progress Energy Carolinas and Northeast Utilities are dealing with this costly and potentially dangerous situation.

### AM / FM

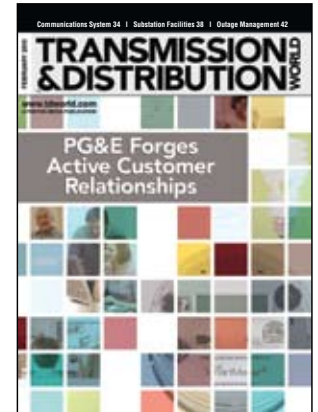
Kansas City Power & Light prioritizes transmission and distribution capital construction projects using rigorous processes to assure that both project benefits and risks are considered during project scoring and selection. This article explores both the simplicity and complexity of this process.

### Line Equipment

Insulators play a critical and sometimes grossly under estimated role in power delivery. Both the insulator supply-chain and the utility perspective regarding their use has changed in several ways since the post World War II system build-out that lasted into the 1970s. Polymer (also known as composite or non-ceramic) insulators have been a change-agent since they became widely used in North America in the 1980s. In this article six North American utilities share their perspective on insulator use.

### Energy Usage

ENEL Distribuzione is developing a recharging infrastructure for use by electric vehicles owners. Specifically, the focus is on the development of a business model to effectively support the e-mobility market and create business opportunities for both public and private operators. This is the only way for electric mobility to become a win-win business, capable of sustaining itself and generating value for all players.



## Columns in Every Issue

Each month, more than 52,000 subscribers<sup>1</sup> 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 mandating to have 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 those incredibly 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 related the status. Stahlkopf told me one such device installed 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 issue 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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<sup>1</sup>December 2008 BPA Circulation Statement.  
<sup>2</sup>Publisher's Own Data - April 2008

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