THE GRID

A PUBLICATION OF FINLEY ENGINEERING • MAY 2011

WELCOME TO THE GRID

Reflecting back on 30 years in the industry, I have come to appreciate the efforts of our clients and colleagues in their relentless dedication to provide safe and reliable services to their customers.

These individuals tirelessly pursue the last-light-out call after storm events, and remain steadfastly committed to maintaining, building and upgrading utility systems. From lineman and supervisor to engineer and administrative assistant, each individual lends their knowledge and expertise to help navigate challenges in the continuously evolving power industry.

It is this passion to serve that I truly treasure. I look forward to continuing to cultivate existing partnerships developed over the years, and eagerly anticipate the new relationships yet to be.

Enjoy this issue of The Grid.

Paul Beaulieu
Manager of Transmission and Substation Engineering

DATA SECURITY AND PRIVACY

Concern among consumers about the privacy and security of their utility-related data continues to grow, and utility CIOs are coming to realize this. One of the best ways for utilities to address both concerns is to make sure IT people are involved in all projects that have privacy and security implications.

Consumer concerns were reported in "Data Access and Privacy Issues Related to Smart Grid Technologies," released October 5, 2010, by the U.S. Department of Energy (DOE). The report noted that the "DOE recognizes that long-term success of Smart Grid technologies depends upon understanding and respecting consumers' reasonable expectations of privacy, security and control over who has access to potentially revealing energy-usage data."

The report went on to note the following: "DOE believes that privacy and access, in the context of the Smart Grid, are complementary values rather than conflicting goals. The practical impact of a Smart Grid depends on its capacity to encourage and accommodate innovation, while making usage data available to consumers and appropriate entities, and respecting consumers' reasonable interests in choosing how to balance the benefits of access against the protection of personal privacy and security."

Utility CIO concern over privacy was highlighted in a recent report (December 2010) titled, "Utility CIOs: Living in a Smart Grid World," published by IDC Energy Insights, and based on a survey of utility CIOs. The survey

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found that privacy has emerged as the No. 1 concern related to data security and management. The report noted, "While management and integration of [smart meters] are a priority, respondents overwhelmingly report data privacy as the key element of IT strategic plans for security."

It is important for utilities to take this CIO concern into consideration. For example, another finding was that one-third of utilities surveyed by IDC noted that IT is not even involved in developing business cases for new initiatives such as smarter distribution grids and smart metering. According to IDC, early involvement of IT reduces the risk of choosing inappropriate or expensive technology.

NERC ORDER FOR TRANSMISSION LINE RATINGS AND EVALUATION

The North American Electric Reliability Corporation (NERC) Reliability Standard FAC-008 requires Bulk Electric System (BES) utilities to provide methods to determine normal and emergency facilities ratings.

While distribution utilities aren't directly impacted by these requirements, there may be some indirect impact if the G&Ts that serve them find themselves struggling with the requirements.

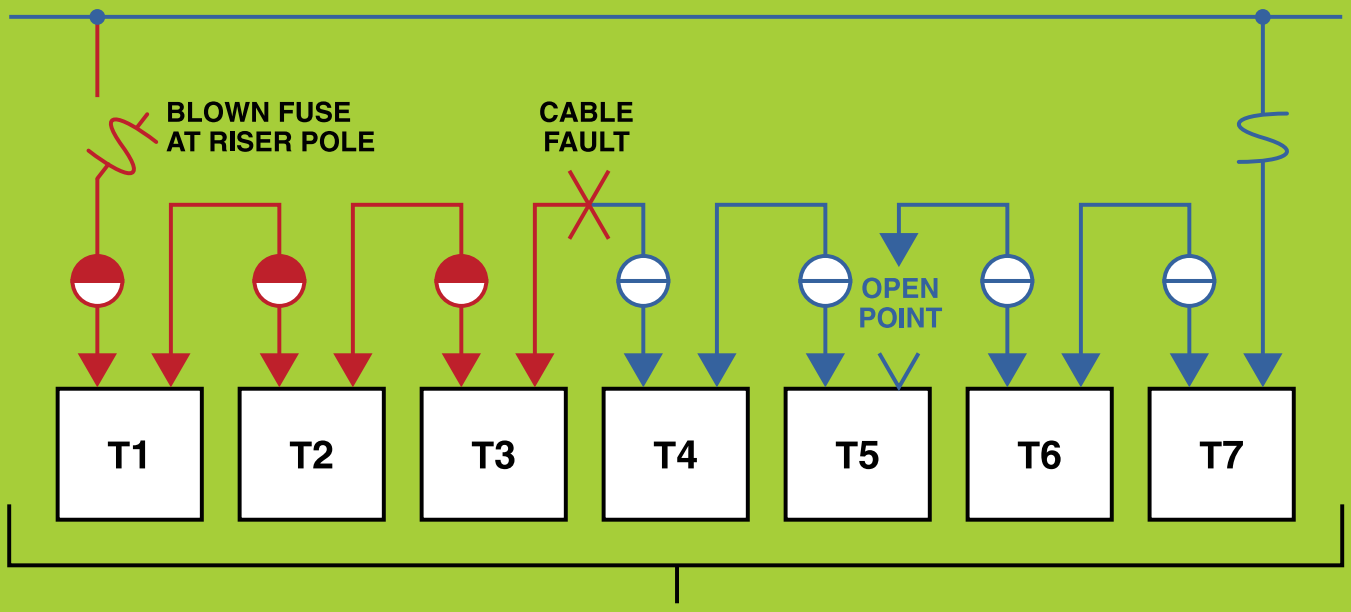
NERC's FAC-008 is the result of Federal Energy Regulatory Commission (FERC) Order No. 693, which requires each G&T owner to develop a facility rating methodology for their facilities.

The methodology needs to be made available to reliability coordinators, transmission operators and planning authorities who have responsibility for inspection and technical reviews. However, FERC does not require a uniform facility rating methodology. Rather, it recommends that each G&T owner develop and document a facility rating methodology that is consistent with industry methodologies.

One challenge facing G&T utilities is that many of their facilities have been in service for years or decades under ratings that were established at the time of construction. As such, documentation of these ratings may no longer be available. In some cases, the basis for the ratings may not have even been documented at all. In such cases, there could be significant costs to the G&Ts to perform record searches, conduct fieldwork and re-create ratings.

Another challenge is that line ratings change constantly. In fact, NERC released an alert on October 7, 2010, in which it noted "possible discrepancies between the design and the actual field conditions of transmission facilities as a potential reliability issue that needs prompt industry attention."

As the industry strives to ensure its system reliability, the utilities rely on their respective engineering resources to evaluate their infrastructure options, which may include Dynamic Line Rating (DLR), Light Detection and Ranging (LIDAR), Power Line Systems — Computer Aided Design and Drafting (PLS-CADD) as well as other custom-developed methods.



UNDERGROUND LOOP CIRCUIT WITH ELBOW CONNECTED TRANSFORMERS T1 THRU T7

FAULTED CIRCUIT

INDICATOR SHOWING FAULTED CIRCUIT DISPLAY

UNFAULTED CIRCUIT

INDICATOR SHOWING NORMAL CIRCUIT DISPLAY

Fault Indicators reduce outage duration by quickly pinpointing the location of the fault. As shown in the circuit diagram, the fault is located between the last tripped indicator and the first untripped indicator. Once identified, this section is switched to become the new open point, allowing full service restoration to the rest of the customers during repairs.

ADVANCEMENTS IN FAULT CIRCUIT INDICATOR DEVICES

Fault circuit indicators (FCIs) have been used throughout the United States since 1948, when Schweitzer Engineering Laboratories introduced the device. The primary purpose of an FCI device is to provide visual or remote indication of a fault on an electric system. Once a fault current is detected, the FCI will trip (usually a RED target).

Studies have shown placing FCIs on an electric system can significantly improve their CAIDI (Customer Average Interruption Duration Index) reliability rating, by more than 50 percent in some instances. While the very first fault circuit indicators were reset manually, new advancements in FCI technology continue to improve their reliability while further reducing CAIDI indexes.

Future generations of FCIs have a variety of possibilities, from reset current, voltage, inrush restraints and battery optimization circuitry to one-size-fits-all applications, microprocessors that poll line determine load current and adjust as necessary, and clamping devices that fit a larger range of wire sizes — in both overhead and underground applications. Newer FCI devices are even using tower, cell, mesh networks and pole receivers to communicate statuses, such as tripped or reset.

Finley Engineering offers a wide range of services, and can recommend FCI installation practices that fit your needs. To learn more, contact Mike Socha at m.socha@fecinc.com.

NATIONAL BROADBAND PLAN: AN ELECTRIC UTILITY PERSPECTIVE

The Federal Communications Commission's (FCC's) "National Broadband Plan," released in March 2010, contains recommendations that have both positive and potentially negative repercussions for utilities and their customers.

On the plus side, the Plan notes that most utilities operate with narrowband communications, a situation that compromises the move to a national Smart Grid. The Plan is designed to encourage utilities to use commercial communication networks and utilize the proposed public safety 700 MHz wireless broadband network.

In a press release, Glenn English, CEO of the National Rural Electric Cooperative Association (NRECA), noted, "Rural electric cooperatives welcome the FCC's plan to promote access to broadband in rural areas. NRECA supports the goals of the FCC plan for universal broadband without reservation."

However, there are some specific recommendations in the Plan that can pose challenges for utilities related to safety, reliability and increased costs. English notes, "NRECA strongly disagrees with certain recommendations to remove 'barriers' to the deployment of broadband, however." For example, the Plan recommends that Congress revoke cooperatives' exemption from the FCC's pole attachment jurisdiction. "The plan offers no compelling reason to revoke this exemption," he states. "The plan recommends subjecting all utilities to more regulation and requiring pole attachment fees to be set at a low, uniform rate, which would result in raising electric rates for consumers, who would bear the additional costs that come with such attachments." This provision, he notes, asks electric consumers to subsidize for-profit telecoms and cable companies, whether or not those consumers want broadband service.

English adds, "In addition to unfair consumer subsidies, the recommendations that would give attachers faster access to poles could compromise both the safety and reliability of electric service in the very communities that the FCC is seeking to help."

In sum, utilities need to become familiar with the National Broadband Plan and come up with strategies and policies that will help them ensure access to all of the benefits, as well as protect themselves and their customers from problems associated with safety, reliability and cost.

DID YOU KNOW?

Originally, Moore's Law was defined as the number of transistors that can be placed inexpensively on an integrated circuit and the rate at which that number could be expanded. Currently, that number doubles approximately every two years.

The capabilities of other electronic devices are strongly linked to Moore's law, whether it is processing speed, memory capacity or digital camera pixels. Each of these capabilities' will only continue to improve at exponential rates.

At this rate of change, it can be difficult to keep up with evolving technology. In fact, analysts predict the college freshman class of 2014 studying certain computer elements will likely study material that will become obsolete well before they graduate.

At Finley Engineering, we recognize the need to not only stay abreast of technological change, but also ways to put this change to work for our business partners.

Finley has invested in technologies, including a ground-based LIDAR system, GPS equipment for staking, power quality monitoring, and video conference, and web XTools that allow us to operate more efficiently for our clients while delivering a high-quality, high-value product.

FINLEY HELPS HREC EXECUTE UTILITY'S LARGEST CONSTRUCTION PROJECT

Heartland Rural Electric Cooperative (HREC), Girard, Kan., recently tapped Finley Engineering to assist the utility in overhauling 374 miles of overhead distribution lines. The project, estimated to cost just over $16 million, was made possible by a $12.1 million federal grant HREC received from FEMA's Hazard Mitigation Grant Program (HMGP). It's the largest HMGP grant awarded to a single entity in the state of Kansas.

Once completed, the three-year effort will significantly improve service reliability for HREC customers. The overhead distribution lines will be built to meet higher construction standards, helping the lines better withstand severe weather-related events, such as ice storms.

HREC commissioned Finley Engineering to provide engineering, right-of-way and project management support. Finley field designers are currently redesigning lines to be more robust, and to perform at a higher standard so future weather storms do not devastate the utility's systems. To keep pace with the fast-track demands of the project, Finley is electronically integrating plans, designs and construction units into HREC's work management system.

Because of the funding made possible by the grant, these improvements will have minimal impact on the electric rates.

The HMGP provides grants to states and local governments to implement long-term hazard mitigation measures. Authorized under Section 404 of the Stafford Act, HMGP was created to reduce the loss of life and property due to natural disasters.

If you would like to learn more about HMGP, or how the Finley Engineering team can assist you in this area, please contact Phil Carroll in our Lamar, Mo., office at 877-682-5531.

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