Regional Utility Goes Global in a Deregulated World

By **Denise Deveau**

How the Internet allowed a Canadian utility to apply out-of-the-box thinking for substation management.

There is no question that operating in a market that was once considered proprietary to the incumbents has required utilities to re-think their way of doing business. Utilities worldwide are facing competition from many quarters, including operations from outside their traditional boundaries. Where smaller utilities are struggling to survive the onslaught of competitive pressures, some of the larger utilities, blessed with large-scale systems and substantial financial resources, are expanding their territory to encompass customers in outlying regions, and in some cases, other countries or continents.

The Internet can be a powerful force in leveling the playing field between the haves and have nots. Whitby Hydro, a municipal utility in Canada, has determined that one means to a profitable end is through leveraging the Internet to expand its offerings to a global customer base.

Controlling Substations through the Web

The answer for Whitby Hydro was found in a concept called enerVista.com, a new utility management model from GE Power Management that allows utilities to manage select substation operations through the Internet. It is a Web-enabled service that provides utilities with access to a complete range of substation functions-from monitoring to administration and reporting-at a fraction of the cost of implementing in-house solutions. With enerVista.com, for a monthly fee utilities can log onto a comprehensive utility management system and use GE Power Management's secure hardware and software infrastructure to access information and manage their business operations.
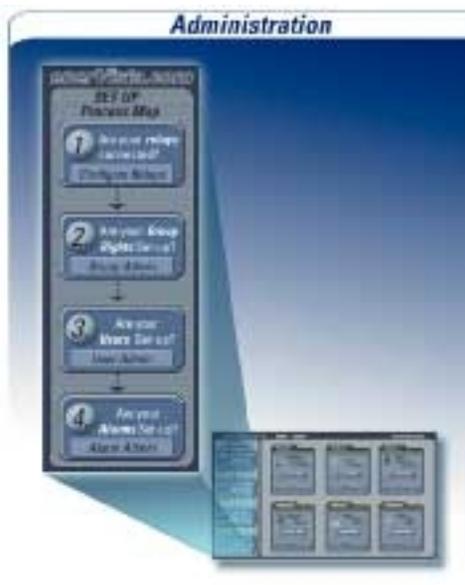
Whitby Hydro is not only using the Internet to integrate and manage local and remote substations, it is also expanding the Internet's functionality and ease of use to generate additional revenues, and streamline and centralize the administrative functions for its own operations and other sites.

Whitby Hydro can use its new Internet-enabled system to

track equipment by different categories such as type, substation, maintenance interval, etc.

With this new Internet business model Whitby Hydro now has the capabilities to improve overall performance and customer service at a reduced cost, as well as expand the reach for its offerings to an international client base.

The Lay of the Land

The Internet story for Whitby Hydro has its roots in 1998 with the implementation of the Electricity Act. The Electricity Act is part of the Ontario government's Energy Act, and provides the guidelines-and deadlines-for the de-regulation of the utility industry in Ontario. The Act is far from an anomaly in the industry. It is very much in keeping with what is happening in other regions throughout North America and around the world. "It (the Act) has basically spawned a whole new industry, where utilities need to be run as businesses first and utilities second," said Kevin Whitehead, Whitby Hydro's engineering supervisor.

Traditionally, a utility's major focus was on cutting costs and maintaining service levels. "You had a captive market and essentially operated with franchise rights," said Whitehead. "Larger utilities had their own SCADA systems to provide automated and remote management of their substations, while smaller utilities operated as standalone entities with little to no automation functions. Your rates, your boundaries and your options were pretty well set out for you."

Competition has changed all that, placing non-SCADA sites especially on perilous ground with fewer resources to survive. With the added debt load factored into the equation, these smaller sites have few options but to sell or merge. "Before the redistribution of the debt load, utilities were only able to maintain a 15 percent margin on power sales. That 15 percent is simply not enough to sustain the business anymore," Whitehead said. As a result of these new constraints, many larger utilities, both inside and outside the country, are viewing smaller, less competitive operations as open territory for takeover bids.

"It's a natural evolution," explained Whitehead. "The goal is to drive efficiencies into the system. In Ontario for example, it is anticipated that 305 utilities will be taken down to 30, with the intent of reducing operating costs through the consolidation of administration, supervision, engineering and accounting systems. This can represent a substantial savings overall. At the same time however, you have to have the infrastructure in place to support that. That infrastructure is not always in place, nor in some cases, is it ever likely to be. Hence the need for an affordable and cost-effective Internet-based solution that can be easily deployed."

The Technology Challenge

While there's a strong business driver behind the amalgamation of utilities, without the Internet, the realities of existing technology limitations can be a major stumbling block. "Every utility must deliver high performance, quality power and minimize downtimes," said Whitehead. "Regulations also require they provide accurate records on metering information and efficiency, which means that data acquisition and control systems play a major role in substation management.

With Whitby-Hydro's Web-based system, any authorized user, from any workstation can gain timely access to substation data.
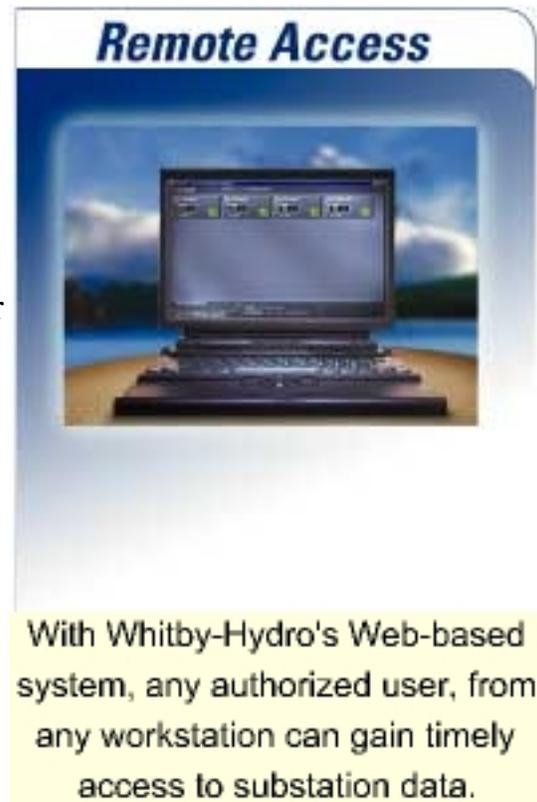
"The problem lies in the fact that with the overwhelming number of amalgamations taking place, every platform is different," he continued. "SCADA systems are proprietary, and integrating additional utility operations to an existing system is extremely costly and difficult. This of course can have tremendous impact on bottom line results, when the ultimate goal is to maintain some level of profitability."

For Whitby Hydro's bottom line however, integration was only part of a much bigger business picture. The Internet provided the impetus to look beyond integrating SCADA with additional substations entering the fold (the utility had recently entered a services agreement with a local utility with three substations), to expanding to new markets. "Our focus changed to a total 'services' orientation. We wanted to develop an infrastructure to support fast and inexpensive integration so we could provide consulting, construction and management offerings to utilities outside our traditional boundaries without them having to replace their existing technology or lose their autonomy," Whitehead said.

The Internet Changes the Game

"Web-enabled substation management is a truly leading edge concept that promises to change the nature of the utility industry in the years to come," said Norris Woodruff, GE Power Management's general manager. "With Web-enabled access to the types of services that were once prohibitively expensive, utilities can now compete more effectively; reduce administration, manpower and technology costs; improve productivity; and enjoy all the benefits of world-class substation management functionality."

He explained that unlike "portal" offerings that allow online monitoring of SCADA systems, enerVista.com is a more comprehensive utility enterprise management system that allows for fast and easy integration without large capital costs.

"It's not just about integrating substations at remote sites," says Woodruff. "We have sites where Web-enabled management is being used to create additional revenue streams for utilities that already have 24/7 control room systems. All they have to do is implement a 'feed' for additional utilities and they can provide their expertise and staff as a value-added service. The beauty of it is, you're not restricted by geographical boundaries. You could easily be monitoring a site half a world away with little capital outlay. It doesn't even have to be a substation. These types of centralized supervision services can also be used to reach non-electrical businesses, such as gas, water and wastewater treatment facilities, among others."

The SCADA Factor

"Remote SCADA is one thing. There you have a window to allow remote access to substation management functions," Whitehead said. "But, you cannot interface SCADA with non-compatible systems and it does not integrate with systems easily. In addition, it falls under the realm of the control room operators, so user access is limited. With Web-based acquisition and control however, you are working with a total system based on universal standards. Any authorized user, from any workstation can access the information they need, whether they are in the control room or in the accounting department."

The only implementation requirement for enerVista.com lies in the area of monitoring functions for remote substations. However, Whitehead maintained that any site, automated or otherwise, can be brought on-line in a matter of days through the simple installation of a communications interface in the form of an "eBox," an Internet-ready PC device that has been field configured for specific application requirements.

For each substation, an eBox is mounted external to the switchgear. It is self-contained and typically takes under a day to install. Inside the eBox is a utility-grade intelligent electronic device (IED) configured to act as a remote terminal unit (RTU) and a cable/phone/radio modem for connection to the Internet through a local Internet service provider. It collects information from the substation that the central servers monitor 24/7 for fault conditions. Any abnormal situation sends a notification via phone, pager or e-mail so the staff can take immediate action. Engineers and operators can interrogate all connected substations from a central site using a standard browser on a laptop or any other Internet-connected PC.

Any data collected at the site, or at the head office location, is housed on the GE Power Management server. The data then] can be used for instant access to functions such as researching of public documents, application notes, guides and Internet links; automatic report generation; centralized scheduling; equipment and service tracking; document storage; and Internet-enabled customer contact.

Utilities Finding a New Role

As a result of its development work with GE Power Management, Whitby Hydro has placed itself in the unique position of a utility-based value-added reseller (VAR). To that end, Whitby Hydro has entered a number of strategic alliances with industry specialists in the areas of generator maintenance, financing, monitoring and control, metering, and engineering to deliver a full suite of services. According to Whitehead, Whitby Hydro is unique because unlike more traditional consulting services, Whitby Hydro is a utility first, with years of industry-related experience. "This gives us a very strong competitive edge when dealing with a worldwide customer base. We can definitely relate to the challenges they are facing," he said.

"With what we have developed, combined with the alliances we have made, we can go anywhere in the world with a solution that can be easily and inexpensively configured and integrated to suit any customer's needs," he continued. "At the same time, with what we have been able to do with the Internet, we can also provide construction, consulting, monitoring, reporting and management functions for any utility. All administrative functions can be channeled through our head office operations, where we can effectively monitor a site in real-time and alert the local service technicians when repairs and/or intervention is required."

"The projects we have worked on with Whitby Hydro are continuing to evolve, and have included everything from implementing remote monitoring to pager and voice mail notification," Woodruff said. Recent projects underway and slated for future implementation by Whitby Hydro include selected control functions, perimeter surveillance using web cams and integrating communications with standby generators to clip peak load sharing.

The Low Cost of Success

While ease of implementation and increased efficiencies are obvious benefits of a Web-based system, there is also the compelling factor of cost of implementation. According to Whitehead's estimates, implementing a Web-based solution from a hardware and installation standpoint is a mere 25 percent of the cost of integrating a SCADA system. In addition, a Web-based system is self-configuring and requires minimal training since it uses a standard Web browser, while SCADA systems require ongoing support and specialized skillsets to operate.

Whitehead said that although Whitby Hydro has consistently had its eye on expanding its services to a global market, "The introduction of the enerVista.com concept has been a huge contributor to what we can offer. We're now ready to spread our wings and are already working on projects in South America. The added bonus with enerVista.com is we can add SCADA functionality without a SCADA budget, and help cash-strapped, struggling utilities around the world compete more effectively."

Denise Deveau is a freelance writer based in Toronto, Ontario, Canada, who specializes in subjects related to utility, high technology and industrial sectors.