EDITORIAL

Cold Facts About Deregulation

There was a news item last month about Russians struggling through the worst winter in a half century and how 17 people in one town west of Vladivostok had frozen to death in their flats. Everyone in the town was complaining that the electric utility, recently privatized, no longer served them because they had no money to pay for electricity. The privatized utility was selling its much needed electricity only to a local industry which had the cash to pay for it. Ah, how the residents longed for the old days when the state-run utility kept everyone alive in their frigid Siberian flats.

The fact that the local power industry, like many other industries in modern mother Russia, had been deregulated, privatized, and hence become an opportunity for savvy investors ,was little comfort to the 17 poor people who froze to death in their beds.

When I saw this report, I did not think especially about the failings of Russians to adjust to a new economic reality as much as I thought about what happens when a government sidesteps it responsibility to care for its people and place that well being into the hands of others whose chief concern is self interest and most especially, money.

Truly, the mask of "deregulation" had been lifted in this case to see the tyranny of capitalism.

Is this particular to Russia? I think not.

It is a cold winter and an even colder reality about the kind of capitalism that has been witnessed in the California deregulated "electricity rush" of 2001.

The California crisis occurred because successive governments in that state, pressured by environmentalists and others, would not permit the construction of new generation facilities. It was determined that it was better to build it elsewhere but not where the electricity was needed. It also occurred because government insisted on capping the retail rate of electricity because ratepayers did not want their bills to increase. As the consumption grew and state utilities could not supply all of the demand, they were forced to look elsewhere and neighbouring utilities, with no cap on the price they could sell their power for, charged as much as they could.

Utilities outside California refused to supply electricity to that state because the utilities purchasing that power were so financially strapped that there was no guarantee of payment. The Californian utilities could not supply enough electricity and millions of people and hundreds of thousands of businesses, great and small, were thrust into darkness. The electricity was turned off. Just like that. Better to leave someone trapped in an elevator or be injured in a traffic accident and die or fall in the dark and be injured or just plain scared and uncertain, than not to be paid a spot market price for electricity.

Even B.C. Hydro profited a billion dollars from the misfortune of Californians. The province was so proud of its opportunistic windfall that it has generated a cash energy rebate to B.C. ratepayers on the eve of a political election.

Well, luckily enough, California is a very rich place and the government there has stepped in now with half a billion dollars to purchase short term contracts to keep the power flowing into the state and it is taking regulatory measures to speed up the construction of new utility generation and offering bonuses to those companies who can being their plants on line sooner to meet the summer peak load. In other words, government has intervened to protect the interest of its people and to act responsibly like it should have done in the first place.

Funny, I always considered myself a capitalist until I start to think that I have no personal or financial interest so great that it should cost the life of a customer. I can't even think I would be very proud to work for a company that placed the interest of its profit, its dividend, before the misery of a customer. I suppose I would not be a very good tobacco company executive or investor who profits from the misery and death of millions. Nor would I want to be a tire company executive that made a knowingly faulty tire and buried the problem in order to avoid the cost of solving it while people rolled their cars and died. Nor would I want to own the Russian utility that refused service to someone who couldn't pay and left them to struggle in the cold and dark until death.

I thought deregulation was supposed to be about competition to see who could build the least expensive generation in order to compete for demand. I thought that deregulation was supposed to bring lower prices and more choices for customers.

Did anyone forecast that this scenario only exists when their is more than enough supply? When the supply is tight, then the price goes up as high as it can and if you can't pay, or won't pay, then you live and work and heat yourself with a candle. How romantic. And if you fall down a flight of stairs or get killed in an intersection with no working traffic signal, then you are a casualty of deregulation and a consequence of someone making a buck.

Welcome to deregulation, everyone. Electricity to the highest bidder and one jurisdiction screwing over another for a dollar, or a billion of them. A profit at someone else's misfortune, and no conscience about it. If you are lucky enough to live in California or Alberta or British Columbia where there are governments flush with cash and political agendas, then you can expect a rebate to soften the economic blow. Prosperity has its perks.

If you live in an impoverished town west of Vladivostok and you have no cash and no clout, then you suffer in the bitter cold and disrespect your government for abandoning your interest.

Randy Hurst
Publisher and Executive Editor
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NEWS

Epcor Buys Insurance Policy: Secures Protection From "Open Market" Prices

Epcor has bought insurance to protect itself from the risks of operating in the deregulated power industry, board chairperson Hugh Bolton has announced.

"It's very costly," Bolton remarked in an interview at a meeting of the Economics Society of Northern Alberta, where he was a guest speaker. He did not disclose the price of the insurance. But under terms of provincial auctions of wholesale power, Epcor must produce a certain amount of electricity. If one of Epcor's three plants goes down, as has happened at TransAlta's Wabamun facility, Epcor would still be on the hook to meet its commitment. That would mean buying on the open market at inflated prices. Such risks also highlight one of Epcor's central goals, to build a $500-million third unit at Genesee. That 400-megawatt unit would be an "independent" supplier. Genesee would be able to sell the power at the best price. Bolton praised Alberta Natural Resources Development Minister Mike Cardinal for saying this week that the province wants to speed up approval processes for power projects. That's crucial, Bolton said, because one of the causes of higher prices is the narrow gap between electricity supply and demand.

"In Alberta today, time is our enemy," he said.

It will take as much as five years for Epcor to get Genesee built. There's another reason to hustle with Genesee 3, he said. TransAlta is expected to announce its own coal-fired addition in the area west of Edmonton, and there is transmission wireline capacity for only one of the two projects.

"That's a fundamental problem," he said.

"Only one can win, and a new line is not in the cards." Epcor has done well for years, Bolton told the luncheon. The value of the Edmonton-owned company has increased by 20 per cent annually. The dividend Epcor will pay the city in 2001 should reach $90.5 million, up from $70.5 million in 2000. "We're in the business of making money," Bolton said. "I don't apologize for that." He also stressed that Alberta's electricity problems are unlike those faced by California.

The deregulation rules differ, and California has added only 672 megawatts of power since 1996, compared to about 1,300 megawatts in Alberta, where the population is about three million.

Transalta to Sell Power Plant to Syncrude

TransAlta has announced the sale of its cogeneration power plant located at Syncrude's Mildred Lake site near Fort McMurray, Alberta to Syncrude's Joint Venture Owners for its book value of $65 milllion.

"This asset did not fit our business strategy of operating the plants we own," said Toby Austin, TransAlta's vice president and general manager of Independent Power Projects, Western Canada.

"We will reinvest the proceeds from the sale as we grow gas-fired generation by 500 megawatts per year."

The 265-megawatt Mildred Lake cogeneration plant, which provides electric and thermal energy to the Syncrude Project, has been wholly owned by TransAlta since 1996 and operated by Syncrude since the plant was commissioned in 1978.

TransAlta is an international electric energy company with more than $7 billion in assets. The company is focused on achieving strong earnings growth and enhancing its competitive edge as a low-cost operator of generation and transmission assets, and a successful developer of gas-fired independent power projects. The company is concentrating its growth in Canada, the United States, Australia and Mexico. TransAlta owns and operates more than 8,000 megawatts of generation plus significant transmission assets in Alberta.

Federal Government Invests in Sustainable Development Technologies

Natural Resources Minister Ralph Goodale today introduced legislation in the House of Commons to create the Canada Foundation for Sustainable Development Technology. The legislation was developed by Minister Goodale, Environment Minister David Anderson and Industry Minister Brian Tobin. The new Foundation will administer the Sustainable Development Technology Fund for the development and demonstration of new technologies, in particular, those aimed at reducing greenhouse gas emissions and improving air quality.

When established, the Foundation will be managed by a Board of Directors with expertise in technologies that promote sustainable development. They will be chosen from the business community, academia and not-for-profit organizations. The Foundation will operate at arm's length from the Government, and will be fully accountable to the public, presenting an annual report on its activities to Parliament.

"The recent Speech from the Throne cites innovation, growth and development as necessary components for prosperity in the new economy," said Minister Goodale. "This Foundation is a creative way to bring the business community and not-for-profit organizations together and to provide the funding to Canadian innovators. The Canadian business community is already a leader in technological innovation which

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We continue to take a proactive approach to environmental issues. Among our accomplishments in 2000, we became the first utility in Canada to achieve ISO 14001 registration. Thanks to the hard work of our employees, SaskPower's environmental management system meets the internationally recognized standards set by the International Organization for Standardization (ISO).

We also announced a project with the Government of Canada to develop a green power project in Saskatchewan. SaskPower expects to provide at least 25,000 MWh of wind energy to federal buildings in the province by 2002, with any excess capacity offered to other customers.

Our Diamond Legacy sponsorship with Ducks Unlimited Canada supports a variety of wildlife habitat projects in Saskatchewan. We've also become an active participant in the national Action by Canadians (ABC) program. We hosted ABC workshops for our employees and the public to provide tips on how to reduce greenhouse gas emissions in daily life. Another challenge facing our industry is the routing of transmission lines. In 2000, we convened a panel of independent experts to assess our current procedures, evaluate industry practices and receive public input. Their recommendations will assist us in future transmission projects.

As well, we're establishing an Open Access Transmission Tariff (OATT) for the use of SaskPower's transmission system. Scheduled to take effect July 1, 2001, this change will secure our direct use of the transmission systems of other utilities, enhancing our sales opportunities.

A major customer-focused initiative at SaskPower this year was the Customer Relations Management (CRM) project. Through CRM, we redesigned a number of business processes that involve customer contact, including outage calls and tenancy changes.

Our people are SaskPower's most important resource and we've launched a comprehensive process to strengthen employee relations, beginning with an employee satisfaction survey. Our priorities for action include facilitating more open, two-way communication and providing opportunities for staff to enhance their business knowledge and leadership skills.

Safety continues to be our top operational priority. We want to be an industry leader in safety performance and we're making progress in reaching our goal. On May 15, 2000, the employees at Shand Power Station marked another safety milestone by operating for three years without a single lost-time injury.

Looking ahead, we'll continue to build on our 70-year tradition of service excellence as we develop new products and services, manage our financial and human resources, and work with our business and community partners.

Near right:
Stephen Snyder
President and CEO,
TransAlta

Far right:
John Wright
President and CEO,
SaskPower

MANITOBA HYDRO

Strong export sales fuel Manitoba Hydro success

Over the past year, Manitoba Hydro continued to take steps necessary to meet the challenges and take advantage of the opportunities presented by the evolving North American energy market.

Our recent successes, including a record net income of $152 million in the 1999-00 fiscal year, are an indication we are not only moving in the right direction, but we have the organization and the people to take us where we want to go.

One of the keys to Manitoba Hydro's success is the continued strong export market for our electricity. Last year, the corporation realized our highest export revenues ever — $376 million. This year, second quarter results are pointing to continued improvement in export revenues, with sales amounting to $261 million for the six-month period, a $58 million increase over last year.

Manitoba Hydro's participation in this lucrative export market has allowed the Corporation to maintain overall electricity rates that are the lowest in North America. In December, the Corporation announced it had decided not to seek any rate increase to its electricity rates in 2001 for the fifth consecutive year. For large industrial customers, rates have remained constant for 10 years, enabling Manitoba business to remain very competitive with respect to electricity costs.

Our success in the export market is also reflected in our progress towards achieving the financial targets we established a few years ago.

The interest coverage ratio improved from 1.23 in 1998-99 to 1.35 in 1999-00. The Corporation's target is to maintain an annual gross interest coverage ratio, which indicates the extent to which net income is sufficient to pay gross interest on debt, in the range of 1.20 to 1.35.

The Corporation now has a debt/equity ratio of 83:17, improved from 84:16 at March 31, 1999, and is on target to meet our goal of a 75:25 debt/equity ratio by 2005-06.

Plus, Manitoba Hydro continues to finance all capital construction requirements through internally generated funds (except for major generation or transmission projects).

One of the keys to ensuring Manitoba Hydro continues to meet or exceed our financial targets will be continuing to take full advantage of the attractive market for export sales.

In March 2000, Manitoba Hydro announced plans to build a natural gas combustion turbine in Brandon by 2002. This facility will provide the energy support required in low water years and will allow the Corporation to maximize revenues from existing hydraulic generating stations by converting interruptible export sales to higher priced firm sales.

In addition, Manitoba Hydro is currently examining options for additional hydraulic generating facilities in northern Manitoba — work that represents a new phase in Hydro's relationship with Cree Nations. For the first time, we are working with Cree Nation communities within the surrounding area to reduce the negative impacts and maximize local opportunities from these future developments, even before a decision is made to proceed

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with construction.

Recently, this has led to an historic agreement with the Tataskweyak Cree Nation which enables the Tataskweyak, and potentially other Cree Nations within the Split Lake resource management area, to acquire up to a 25 per cent ownership interest in the proposed Gull Generating Station. Work is continuing with Cree Nations in the vicinity of the Gull, Notigi, and Wuskwatim projects, to perform the necessary planning and environmental studies to enable us to make a decision within the next year on making an application for licensing of one or more of the projects.

Our focus remains on ensuring Manitobans receive the best possible service and rates from their utility. An example of this focus is Manitoba Hydro's on-going transformation into a one-stop provider of high-quality energy services. Staff from both Manitoba Hydro and Centra Gas, which was acquired in July 1999, are engaged in an extensive integration process. Tremendous progress has been made to bring together the two organizations and we are well on our way to realizing the cost savings and improved services that will benefit all our customers.

"As Manitoba Hydro moves into the future, I am confident we are heading in the right direction, that we are taking the steps necessary to be the utility that today's marketplace demands and our customers deserve," said Manitoba Hydro's President Bob Brennan.

Near right:
Bob Brennan
President and CEO,
Manitoba Hydro

Far right:
Ron Osborne
President and CEO,
Ontario Power Generation

ONTARIO POWER GENERATION

Ontario Power Generation (OPG) is one of the largest electricity generators in North America.

We are preparing for a future in which we will compete in an open electricity market. To this end, we are optimizing our generation performance, strengthening our commercial operations, sharpening our customer focus, and building a workplace based on partnership, performance excellence and goal-sharing.

Financially, the company has achieved good results. Net income for the first nine months of 2000 was $543 million on revenues of $4.45 billion. In addition, the company has received investment-grade credit ratings from Canada's two rating agencies.

OPG's nuclear performance index has steadily improved by more than 40 per cent since the end of 1997 — moving the company closer to its ultimate goal of becoming a top-quartile nuclear operator worldwide. The company's diversified mix of nuclear, hydroelectric and fossil-fuelled stations enables it to reliably produce electricity that is cost competitive, safe and clean.

Seventy-five per cent of OPG's generation produces virtually no emissions contributing to acid gas, smog or global warming. At our fossil stations, we have reduced our emissions by almost 60 per cent since the early 1980s. To further reduce fossil emissions, in September 2000 OPG announced plans to invest $250 million for the purchase of four selective catalytic reduction units for installation at our Nanticoke and Lambton facilities. We are also planning to quadruple our portfolio of green energy sources, from the current 125 megawatts to 500 megawatts by 2005.

OPG's portfolio will be even cleaner with the planned return to service of the Pickering A nuclear station. Assuming all necessary regulatory approvals are met, Pickering A will annually displace 13 million tonnes of greenhouse gases that otherwise would be generated by coal-fired stations.

In July 2000, OPG announced the lease of its 6,200 MW Bruce A and B nuclear generating stations to Bruce Power, a subsidiary of British Energy. The lease helps the company meet a condition of its generation license that it decontrol a portion of its generation. This is one of the largest transactions of its kind ever undertaken in the industry. It is expected to close by mid 2001.

TORONTO HYDRO CORPORATION

Toronto Hydro Corporation operates the second largest municipally-owned distribution utility in North America, distributing 25 per cent of the electricity in Ontario. Its workforce of 1,960 skilled professionals serves 657,000 customers. Annual revenues are $1.9 billion with a peak load of 4,793 megawatts.

Toronto Hydro's new mandate and performance measures have created a distribution company that is now more responsive and customer focussed than ever before. While our distribution company is still a monopoly-based business, its ability to earn a profit will be based on a strict set of Performance Based Regulations monitored by the Ontario Energy Board.

Toronto Hydro's new retail affiliate, Toronto Hydro Energy Services Inc. (THESI), a fully integrated energy management company offering consumer and business customers value-added solution, was licensed in March 2000 to market both electricity and gas.

THESI has been successfully launching new products and services, and according to President John Brooks, the market is responding very favourably to its service offerings. THESI rolled out its residential retail offer throughout the fall at the major home shows around the GTA, winning an award for its booth at the recent Exhibition Place show. The group also won an award in November from the Canadian Marketing Association for its 'Black Hole' direct mail campaign from last Spring. A direct mail campaign in the 905 and 416 areas has been well received by consumers.

THESI is an active participant in the development of new generation projects in Ontario, including the Portlands co-generation project, in partnership with Boralex, which is expected to launch in the first quarter of 2001. "And our waterfront wind-turbines have moved ahead through the government approvals process," says Brooks. "Our target is to get them built this year."

In September, Toronto Hydro launched another affiliate — Toronto

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Independent Power Producers' Society of Alberta
2001 Trade Show and Conference

Alberta's Power Market Open for Business?

March 18-20, 2001
Banff, Alberta

Keynote Speakers:

Seabron Adamson, President, Frontier Economics Inc
Making Dollars and Sense from Understanding the Fundamentals Behind Alberta's Electricity Prices

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Professor Robert Michaels, California State University
California's Electrical Disaster and the Future of Competitive Power

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David Baxter, Executive Director, Urban Futures Institute
Consumer Realities for Energy Producers

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In-depth Panel Discussion on
Defending the Market
Moderated by Jeff Collins, CBC Radio
Seabron Adamson, Frontier Economics
Sean Durphy, ENMAX Corporation
Dan Macnamara, IPCCAA
Martin Merritt, Engage Energy Canada LP

Sessions:

- The Operation of Alberta's Market
- Competitive Hurdles to Successful Development
- Alternative Energy Solutions
- Mechanics of Retail Choice
- Wholesale Pricing Options
- Independent Retailer Strategies

There will also be a Trade Show displaying the latest in technology, products and services, a Welcome Reception, Sunday March 18 and a Mountain Celtic Evening, Monday March 19, 2001.

For a full program and registration form please visit:
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Hydro Telecom, which is dedicated to maximizing the value of the utility's fibre optic network and other telecommunications services. "We have an extensive fibre optic system across the city that we use for our own telecommunications purposes and we've leveraged the surplus capacity on this system into a multi-million dollar dark fibre leasing company," says Brooks.

And a third new initiative was announced at the end of October — EBT Express, a joint venture with Ontario Power Generation. EBT Express will provide data management and transaction services for local distribution companies and energy retailers. EBT Express services will be a new 'niche company' that is a direct product of the opportunities presented by the new electricity market.

"As you know, when the electricity market opens, our customers can choose their energy suppliers. Our system will have to keep track of whose customer is whose so that they can be billed correctly. This means that there will be huge amounts of data flowing back and forth between the LDC and each retailer," says Brooks.

"We and OPG have taken a leadership role in the province on this venture and we expect to have all the joint venture agreements signed shortly. We already have letters of intent from many municipal utilities agreeing to sign on for this service," says Brooks. Having gone through massive change over the past three years, Toronto Hydro has become stronger, more customer-focussed and determined to retain its position of leadership in the new deregulated market.

Near right:
John Brooks
President and CEO,
Toronto Hydro Corporation

Far right:
André Caillé
President and CEO,
Hydro-Québec

HYDRO-QUÉBEC

In 2000, Hydro-Québec made considerable progress in its efforts to achieve the business objectives set forth in the Strategic Plan 2000-2004 concerning growth, increased profitability, and improved quality and reliability of service for all its customers.

After a successful Y2K rollover, Hydro-Québec confirmed that its Québec rates will remain frozen until 2002. The company also reiterated its intention to continue developing profitable hydroelectric potential.

Changes in Québec's regulatory landscape, combined with the development of its activities on wholesale markets, led Hydro-Québec to adjust its management structure by separating its Generation, Transmission and Distribution business units.

In terms of financial performance, the results achieved to date indicate that the company will be able to meet its objectives for 2000. In fact, the first nine months ended with consolidated net income of $887 million, up $382 million from September 30, 1999. This growth stems largely from the increase in electricity sales to the United States and the sustained growth of the Québec economy, which pushed up revenue from electricity sales in Québec by 3.8 per cent compared with the first nine months of 1999.

In the area of investments, Hydro-Québec announced a capital program of $2.3 billion for 2000. One third of the investment was used to maintain power system reliability, while more than $500 million was earmarked to ensure security of supply and meet growing demand from Québec customers.

On the international stage, through its subsidiary Hydro-Québec International, the company acquired the transmission assets of TRANSELEC in Chile and commissioned the Mantaro-Socabaya interconnection in Peru. Also, TransÉnergie US, a subsidiary of Hydro-Québec, received its first authorization from the FERC to construct and operate a direct-current submarine line between Connecticut and Long Island, New York. It also built and, since July 2000, has been operating an interconnection using a new direct-current technology in Australia.

For its part, Hydro-Québec CapiTech, a venture capital subsidiary, acquired strategic interests in certain California companies, including Capstone Turbine Corporation (development and marketing of microturbine technologies), Metallic Power (design of fuel cells), MainStreet Networks (advance measuring and on-line information services) and Automated Power Exchange (integrated solutions for wholesale electricity sale).

In 2001 and beyond, customer satisfaction will be an overriding concern. Hydro-Québec will continue to adjust its services to its customers' priority expectations in order to raise the percentage of "very satisfied" customers to 50 per cent by 2004.

Completing the development of Québec's hydroelectric potential is another major objective. Hydro-Québec will continue, as it has for several years, to offer local communities business partnerships. Projects will be undertaken on three conditions: they must be profitable under current market conditions; they must be environmentally acceptable; and they must be favorably received by local communities.

Finally, electricity has made significant progress in the area of road transport, where Hydro-Québec offers some very promising technologies. For example, Hydro-Québec CapiTech is the owner of AVESTOR Corporation, which recently teamed up with an automaker to demonstrate the use of lithium-metal-polymer (LMP) batteries in electric vehicles. Tests and demonstrations will continue in Canada and the U.S. through 2001.

HYDRO-QUÉBEC

L'année 2000 marque pour Hydro-Québec, une étape importante dans l'atteinte de ses objectifs d'affaires prévus au Plan stratégique 2000-2004, en ce qui concerne la croissance, la rentabilité accrue et l'amélioration de la qualité et de la fiabilité des services offerts à l'ensemble de sa clientèle.

Après un passage à l'an 2000 réussi, Hydro-Québec a confirmé le gel tarifaire jusqu'en 2002 pour sa clientèle québécoise et réitéré sa volonté de poursuivre le développement rentable du potentiel

hydroélectrique.

Par ailleurs, l'évolution du contexte réglementaire québécois ainsi que le développement de ses activités sur les marchés de gros ont incité Hydro-Québec à ajuster sa structure de direction par la séparation fonctionnelle des unités d'affaires Production, Transport et Distribution.

Sur le plan financier, les résultats obtenus au moment d'établir ce bilan, indiquent que l'entreprise sera en mesure d'atteindre ses objectifs prévus pour 2000. En effet, le troisième trimestre s'est terminé avec un bénéfice net consolidé de 887 M$, soit 382 M$ de plus qu'au 30 septembre 1999. Cette progression est attribuable en grande partie à l'augmentation des transactions d'électricité aux États-Unis et à la croissance soutenue de l'économie québécoise qui a permis une progression des produits des ventes d'électricité au Québec de 3,8 porcent par rapport au troisième trimestre de 1999.

Au chapitre des investissements, Hydro-Québec a annoncé un programme de 2,3 G$ pour l'année 2000. Le tiers des sommes investies sert à maintenir la pérennité des actifs, tandis que plus de 500 M$ sont prévus pour assurer la sécurité d'approvisionnement et répondre à la demande croissante de la clientèle au Québec.

À l'international, par l'intermédiaire de sa filiale Hydro-Québec International, l'entreprise a fait l'acquisition des actifs de transport de TRANSELEC au Chili et procédé à la mise en service de l'interconnexion Mantaro-Socabaya au Pérou. Par ailleurs, TransÉnergie US, filiale d'Hydro-Québec, a reçu de la FERC une première autorisation pour la construction et l'exploitation d'une ligne de transport sous-marine à courant continu entre le Connecticut et Long Island, à New York.

De même, elle a réalisé et exploite depuis juillet dernier, une interconnexion utilisant une nouvelle technologie à courant continu en Australie.

Pour sa part, Hydro-Québec CapiTech, filiale spécialisée en capital de risque, a acquis des participations stratégiques, notamment dans des entreprises californiennes : Capstone Turbine Corporation (mise au point et commercialisation de technologies reliées aux micro-turbines), Metallic Power (conception de piles à combustible), MainStreet Networks (services de mesurage avancé et d'information en ligne) et Automated Power Exchange (solutions intégrées pour la vente en gros d'électricité).

En 2001 et dans les prochaines années, la satisfaction des clients demeurera une très grande priorité. Hydro-Québec ajustera ses services aux attentes prioritaires de ses clients afin d'atteindre un niveau de 50 porcent de clients très satisfaits d'ici 2004.

Le développement hydroélectrique au Québec demeurera une priorité importante. Ainsi, Hydro-Québec continuera de proposer aux communautés concernées une association sur une base de partenariat d'affaires. Les projets en vue seront entrepris si trois conditions sont réunies : être rentables à la lumière des conditions du marché ; acceptables du point de vue environnemental et accueillis favorablement par les communautés locales.

Enfin, il faut signaler les progrès que fait l'électricité dans le domaine du transport terrestre. Hydro-Québec offre des technologies très prometteuses dans ce domaine. Par exemple, Hydro-Québec CapiTech est propriétaire de la Corporation AVESTOR, qui s'est associée dernièrement avec un constructeur automobile pour tester les batteries au lithium-métal-polymère (LMP) destinées aux véhicules électriques. D'autres essais et démonstrations se poursuivront au Canada et aux États-Unis tout au long de 2001.

NOVA SCOTIA POWER INC.

The year two thousand has been a year of achievements for Nova Scotia Power Inc. As we focused on our vision to be the customer's choice in energy and services, and on our key strategies, 2000 became a year of moving forward and improving our performance.

Early in 2000 NSPI was granted approval by the Nova Scotia Utilities and Review Board for two new industrial rates. The Real Time Pricing and Load Retention rate options will help our large industrial customers to be more competitive. They will also help Nova Scotia Power retain customers and keep prices stable.

Stable prices has been a key focus for Nova Scotia Power over the past several years. NSPI hasn't increased prices since 1996. There were no increases in 2000, and there will be none in 2001. Keeping prices stable was a key challenge for our company in 2000, as fuel prices drove up costs in all other areas of our business.

Our success in achieving price stability is the direct result of the concerted efforts of our employees.

When they weren't busy moving the bar forward for NSPI customers, our employees were actively participating in building success in their own communities through our Good Neighbour programs. NSPI employees raised more than $140,000 through payroll deductions, and accessed funds through the Good Neighbour Volunteer Fund to assist more than 100 community projects. In all, Nova Scotia Power's Good Neighbour programs gave more than $600,000 to the communities where we live and work.

As the volume of business being conducted over the Web increased in 2000, Nova Scotia Power introduced new programs to better serve the needs of our customers who prefer to use this medium. NSPI's new E-Bill option allows all customers to pay their power bills online.

We also developed and delivered our new Smart Energy Information Service — an online energy management tool. With SEIS, our industrial and commercial customers can track their energy use at fifteen minute intervals and access these profiles via the Web. The system gives our customers better control over their energy use, and is a tool that can help them take advantage of energy savings.

Nova Scotia Power was the first company to use Sable Gas to generate electricity in Atlantic Canada. The gas which comes ashore in Goldboro, Guysborough County in Northeast Nova Scotia, is carried by Maritimes and Northeast Limited's main pipeline through Pictou County to the New Brunswick border and into the Northeastern United States. When Nova Scotia Power struck an agreement to purchase 60 million cubic feet per day of gas from Shell Canada back in 1997, the deal made construction of a natural gas lateral to Halifax viable and construction began.

Nova Scotia Power's Tufts Cove Generating Station in Dartmouth underwent an extensive natural gas addition. All three generating units were refitted to be dual firing — able to burn either oil or natural gas. Emissions monitors and low Nox burners were incorporated to improve the plant's overall environmental performance.

On November 1st commissioning of the pipeline was completed, and gas began flowing into the plant within a few days. Tufts Cove can now fuel switch between oil and gas according to energy markets and which fuel best helps us to

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Power failures are expensive and can significantly impact the bottom line of an organization. Electrical engineering and maintenance personnel have long been aware that identifying, monitoring and correcting power quality problems is vital to keeping facilities and processes running smoothly. This forum offers electrical professionals the opportunity to keep abreast of the latest technologies and techniques available in this area. It also offers an excellent opportunity for delegates to ask specific questions and exchange ideas relating to their own applications. This is designed to be an interactive, problem-solving, learning environment for delegates of all disciplines.

Program Highlights

- Power Quality in the Real World: An indepth session using actual case histories to illustrate power quality problems and solutions.
- Recent developments in power quality monitoring equipment, software and applications.
- Transient voltage surge suppression solutions for sensitive microprocessor-based applications
- Utility Power Quality Solutions Service
- Power system harmonics analysis, standards and mitigation
- The economics of power quality monitoring
- Evaluation, isolation and correction of grounding and power quality factors
- Improve power quality, save money and help the environment

YEAR-IN-REVIEW FEATURE

Continued from page 17

meet our commitment to keep prices stable for our customers.

Nova Scotia Power's parent company changed its name to Emera from Nova Scotia Power Holdings. The new name better reflects the nature of Emera's business. Emera is a diversified energy and services company, with several subsidiaries in addition to Nova Scotia Power. Emera was the first Canadian company to purchase a U.S. utility. Emera's acquisition of Bangor Hydro was announced in June. The sale will be completed within the first six months of 2001.

Late in 2000 Nova Scotia Power made an unprecedented submission to the Utilities and Review Board. NSPI is asking the board to approve a process that would allow it to offer new energy options and solutions to residential and commercial customers. If the process is approved, customers would still be able to choose their existing rates, or they could take advantage of the new optional energy solutions and prices.

NSPI's Marketing and Sales Division has been hard at work developing these new optional packages. Initial offerings will likely include Time of Use rates as an energy saving tool. Currently, only customers who own an Electric Thermal Storage unit are eligible to take advantage of half price electricity between 11p.m. and 7a.m. Under the new optional plans Time of Use rates would be more widely available to customers who purchase enabling technologies such as timers for water heaters, dish washers or clothes dryers. The UARB will hear evidence to support the submission on March 19th.

In the coming year Nova Scotia Power will continue to focus on price stability. NSPI has committed to keeping prices stable in 2001, and that will again require the focused efforts of all our employees.

We will continue to be guided by our strategies as a means of achieving our vision. By building customer loyalty, working to earn the commitment of employees, managing costs and supporting growth through operational excellence, we will move the bar forward in our quest to be the customer's choice in energy and services.

NEW BRUNSWICK POWER

In 1999-2000, net income was $17 million which continued a positive trend of improving net incomes.

The Corporation's operating cash flow was $243 million, which is stable when compared to $247 million in 1998-1999. Capital expenditures increased to $95 million from $68 million the previous year. Higher capital spending, funded from cash flow, reflects the decision to make strategic investments to improve the future performance of the Corporation. Free cash flow, the funds available for debt reduction, increased to $196 million in 1999-2000, which is more than double the level of two years ago. Debt reduction for the year was $233 million.

This is the fourth consecutive fiscal year that NB Power has reduced its debt. These financial performance indicators demonstrate significant and continuing improvement. Over the past four years, the Corporation' s financial turnaround has exceeded $100 million, from a loss of $87 million in 1996-1997 to a net income of $17 million 1999-2000. During this turnaround period, the debt was paid down by over $453 million.

Operating Performance

The conventional generating units met their over-all availability and reliability performance targets allowing for a reliable, economic supply for in-province customers and record benefits from export sales. A new human resources plan, scheduled for completion in 2000-2001, will bring Generation's staffing levels in line with high-performing electric utilities in North America.

The Point Lepreau Nuclear Generating Station completed another year of successful operation. The station achieved its second longest period of continuous service since commissioning in 1982. The preliminary refurbishment definition and engineering work has begun so that an informed decision on whether to proceed with station life extension may be made in 2002.

Business Development Strategy

NB Power' s business development strategy leverages geographic location, generation diversity and transmission access in order to maximize the Corporation's business potential. The Corporation is pursuing partnership arrangements for new projects.

NB Power's plan is to maximize the value of its existing infrastructure through natural gas generation for in-province use and export. The joint development with Westcoast Energy of a natural gas combined cycle unit at Courtenay Bay, known as Bayside Power, is proceeding for completion in 2001. Discussions are on-going regarding further development at Courtenay Bay and other locations. New transmission models are being explored to take further advantage of NB Power' s strong interconnections with New England and Eastern Canada.

Business Unit Strengthening

NB Power has initiated a program in each business unit to integrate risk management with current business practices and to introduce a more sophisticated framework for control procedures. The plans and results are monitored at both the Executive and Board levels.

The Joint Workplace Improvement initiative, known as Outreach 2000, was another positive development. A Workplace Improvement Committee Conference, jointly sponsored by NB Power and the International Brotherhood of Electrical Workers, was held in January 2000.

From this beginning, employee awareness sessions during April 2000 provided face-to-face forums for open and frank discussion about the current operations and future direction of the Corporation. **ET**

Near right:
David Mann
President and CEO,
Nova Scotia Power Inc.

Far right:
J.F. Hankinson
President and CEO,
NB Power

SOFTWARE

Engineering Consulting Firm Reduces Overhead by Streamlining Accounting

By Bob Morrison

A Windows-based financial management system that encompasses both accounting and project management allowed MCW Consultants Ltd. to handle an increased volume of work due to significant organic growth as well as growth from acquisition of another company, without increasing the size of its accounting staff.

More specifically, since 1990 MCW Consultants Ltd. has increased revenues by 65 per cent, number of employees by 50 per cent and with the help of the powerful new Wind2 accounting software, the accounting and administration staff has remained constant. This ability to do more with the Wind2 Software product has helped put the MCW Companies 15 per cent above the average revenue per employee, for a firm of comparable size as published in the Association of Consulting Engineers of Canada 1999 Business Survey.

The software enables the existing staff to function more efficiently by eliminating some of the redundant tasks they used to perform. For example, they no longer enter information from employee time sheets into a spreadsheet to track projects. Employees do this themselves using the new software. And since project management and financial systems are integrated, the accounting staff no longer manually enters data from the project management spreadsheet into an accounting program.

They save additional time in the consolidation of data from the firm's four (4) offices. For management, the new system has been valuable in adapting to the larger volume of business by providing reports that give an immediate picture of the firm's profitability.

MCW Consultants Ltd. is a mechanical and electrical consulting engineering firm with offices across Canada. The firm provides engineering audits, conceptual design, detail design, construction management, and commissioning services for both new construction projects and renovations. MCW Consultants Ltd is involved in projects across Canada and around the world from Hong Kong to Moscow.

Duplicate data entry

MCW Consultants Ltd. employs approximately 120 people. Fifty of those are engineers while the rest are support staff. The accounting department, which handles the firm's $10 to $15 million annual revenues, consists of three employees in the Toronto office, one in Winnipeg, and two in Vancouver. These employees are responsible for compiling information related to project status, such as data from engineers' time sheets, and consolidating it with the financial information such as billing and expenses. In the past, this required them to manually gather time sheets and type the information into the spreadsheet that tracked project status.

They also spent time manipulating the spreadsheet data to summarize the information. The spreadsheet was not integrated with the DOS-based accounting software so there was also the time-consuming step of manually entering data from the spreadsheet into the accounting program. Once a month, financial data from each of the four offices was consolidated so that management could evaluate the performance of the entire firm. Employees in Toronto and Vancouver prepared hardcopies of their data and sent them to Winnipeg. There an employee re-entered the information. The process of re-entering the other office's data required between three and four days each month.

In addition to the time lost to data re-entry, this approach did not provide management with the information needed to track the profitability of on-going projects. Determining the numbers of hours spent on a project required gathering information from time sheets and a project management time schedule. Determining expenses required similar efforts using expense reports and the financial accounting software. It was difficult, however, to keep both the project management spreadsheet and the financial system up-to-date. By the time information became available, it was often too old to be valuable as a means of telling where a project stood in relation to its budget.

To improve the efficiency of the accounting process and to get a better handle on profitability, MCW Consultants Ltd. decided to combine the tracking of time and expenses in a single program that handles both project management and financial accounting. They chose the Wind2 Financial Management System (FMS) for Windows from Wind2 Software, Inc., Fort Collins, Colorado. The Wind2 System fully integrates general accounting functions with project invoicing and reporting, budget control, profit analysis, employee management, cost proposal development, and accounts receivable tracking. Besides being impressed with the comprehensive reporting capabilities of the software's report writer, Crystal Reports, MCW Consultants Ltd.'s research indicated that this was one of the best time-tracking programs available. Management also appreciated the fact that there was excellent local support available from Brink and Associates, Toronto.

Integrated system

Now employees enter their time daily from their PCs using the software's timesheet module, sparing the accounting staff the task of compiling this data. The information is instantly charged to the appropriate project, giving each local office manager up-to-the-minute project reports. These reports are generated by the software's business management module, which accesses employee time records, as well as project expenses and client receipt information, to show where labor costs stand in relation to the project billing. Because the reports are available at all times, there is plenty of time for corrective action to prevent overruns. If a manager sees that a project is 50 per cent complete, for example, and that 75 per cent of the labor costs have already been incurred, he can work on remedying the problem prior to final billing.

Once the time and expense information has been entered, it can be used to create invoices with hardly any additional effort. The invoices are more complete because, for example, if an engineer has entered a five-dollar plotting charge for a

job into the software, the billing module picks up that item up the next time a bill is generated for that client. Project management information also moves seamlessly into financial accounting, eliminating the need for time-consuming consolidating entries that were required in the past and making it possible for management to obtain a real-time picture of business performance.

The monthly consolidation of the four offices' data goes much faster with the new system. All offices provide their Wind2 data for the month electronically for integration into the Wind2 program. The entire process takes one person about one-half hour, eliminating the three or four days of data re-entry that were required in the past. Because this information is integrated with the financial system, real-time financial reports are available within hours of the completion of monthly billings.

Standard and custom reports with critical information

The software's report writing capability gives MCW Consultants Ltd.'s management the ability to take action on potential problems earlier than they could in the past because the reports are available instantly and both financial and project data is complete and up-to-date. For example, the custom designed gross margin report shows, for each project, the actual labor cost to date, expenses, how much has been billed, and how much has been collected, giving management an instant picture of profitability. If a project manager sees that a lot of employee time is being spent on tasks that were not in the original estimate, he or she knows that it's time, if negotiations for change orders have not commenced with the client, to start them. Or, by seeing $20,000 in expenditures that haven't been invoiced, he or she knows it's time to bill that client. Also, the time journal report shows each person's chargeable versus non-chargeable hours. This allows management to take action and adjust staffing levels. Management believes that these reports are indirectly helping to increase profitability by letting them take action on these types of issues immediately. In addition to showing the profitability status of each project, the gross margin report can also be generated to show the profitability status of projects for an individual office, and for the entire company.

MCW Consultants Ltd., with the help of Brink and Associates, using the system's built-in report writer customized some of Wind2's many standard reports. The customization was done primarily to simplify the standard version and maximize the comfort level and familiarity of the report format so that management would embrace its use. In some cases, however, the customization was done to turn a generic report into one that is specific to MCW Consultants Ltd. For example, the accounts receivable report was customized to include the firm's name and the local office that generated the report. Client names are portrayed in bold print to make them easy to identify. These sorts of changes are an aesthetic improvement over the reports from the old DOS-based accounting system that were generated in plain text on a line printer.

MCW Consultants Ltd. is a larger company than it was before the implementation of an integrated accounting-project management system. But the efficiencies of this approach allow the same size accounting staff to handle the increased activity. One person's time is no longer wasted each month re-entering financial data for consolidation. More importantly, in spite of the increase in the firm's size, management now has a better understanding of its overall performance, thanks to current and accurate profitability reports.

Bob Morrison is Financial Administration Manager with MCW Consultants Ltd. For more information visit www.wind2.com. **ET**

ELECTRICAL MAINTENANCE

Integrating Ultrasound and Infrared Technologies Saves Money, Averts Catastrophe

While conducting a routine inspection with an ultrasonic instrument at a South Carolina glass manufacturing plant, Larry Wilcox detected a problem with a 20-year-old piece of switch gear. By the manufacturer's standards, it had already outlived its life expectancy.

"In a best case scenario, if the malfunctioning equipment had caused even one circuit to burn out, the plant would have had to shut down to repair the equipment," said Wilcox, President of Predictive Maintenance Group (PMG) in Johnson City, Tennessee. "When the cost of lost production time is added to the cost of damaged equipment and repairs, the company could have lost about $100,000. Fortunately, predictive maintenance was at work, and the customer replaced the part at its convenience. Repairs cost the company barely $1,000!"

But the worst case scenario, according to Wilcox, is when something blows which can cost a company from $100,000 to a million dollars. The damage can even be catastrophic.

An Integrated Approach to Predictive Maintenance

Wilcox believes in using all available technologies to diagnose and detect mechanical problems. Thus combining ultrasound and infrared thermography has become PMG's signature approach to predictive maintenance.

"It seems lackadaisical for a predictive maintenance specialist to rely on just one technology," Wilcox said. "When a mechanic works on your car, he has more than one wrench in his tool box; it's filled with many different tools he needs to get the job done. We do the same with electrical inspections. With ultrasonics and infrared thermography, an inspector has a greater chance of detecting a problem before it escalates and gets out of control."

In the case of the glass manufacturer, there are several 13.2 kilovolt (kv) transformers that drop voltage down to a power level that is more practical for the plant. Each transformer has three high-voltage hot leads coming into the switch gear. These leads connect or disconnect the system's electricity. Wilcox discovered that high voltage had started to cause corona and had built up ozone around the high-voltage wires. Ozone had ionized the surrounding air and deteriorated the unit.

Infrared Thermography, One Line of Defense

To diagnose the situation, Wilcox turned first to infrared thermography which involves a complicated and expensive portable non-contact thermometer that works like a camera to provide real-time live pictures. PMG employs the technology on inspections to penetrate the skins of cabinets, load centers and motor control centers. He locates high-resistance connections by the increased amount of heat present, a sure indication of a problem. Every time a circuit goes on it warms up a metal clip attached to the top and bottom of a fuse. Repeated warming up and cooling down periods cause the clips to lose their tension. This allows corrosion to creep in between the two conduct surfaces. As this builds up it forms a resistance that impedes the flow of current. As the current starts to back-up, heat is generated.

It becomes a vicious cycle," Wilcox explained. "The more heat produced, the more resistance that develops. And electrical problems never cure themselves on their own; they get increasingly worse. Sooner or later the problem must be addressed."

Ultrasound is Like a Crystal Ball

However, while an infrared instrument detects heat, it is not sensitive to the three most destructive things that can happen in an electrical system — corona, arcing and tracking (a miniature arc looking for a place to become a full grown arc). Infrared thermography will not detect these problems in their early stages, first because the heat generated is non-existent or minimal, and second because the technology is blind to what is going on behind a sealed cabinet. Infrared is a valuable tool only when corona, arcing and tracking go undetected and the

condition exacerbates causing a galloping increase in temperature.

An ultrasonic instrument (such as UE Systems, Inc.'s Ultraprobe 2000), on the other hand, picks up the sound of corona, arcing and tracking even above the ambient noise of the manufacturing plant and has the ability to "see" through walls. This makes it an ideal tool in early detection of potentially destructive electrical distrubances. It pinpoints problems while they are still in their infancy, when repairs are easy to make and inexpensive.

An ultrasonic instrument detects the high-frequency noise produced by electrical discharges and translates it, via heterodyning, down into audible ranges. An inspector listens to the specific sound quality of each type of emission over headphones while he observes the intensity of the signal on the instrument's meter. Normally, electrical signals should be silent, although some may produce a constant 60 cycle hum or some steady mechanical noises. These should not be confused with the erratic, sizzling frying, uneven and popping sounds of an electrical discharge.

"As corona builds up it deteriorates the insulation of the cable, an extruded strand shield whose function it is to contain the voltage within the cables," Wilcox explained. "Eventually you have a high-voltage cable with insufficient insulation and a grounded cable nearby. As long as the two cables don't touch it's fine. But when a high voltage cable makes contact with a ground cable it results in arcing which either shuts down the equipment or causes a circuit to burn out."

Left undetected, the situation might have become catastrophic. Wilcox explained. "Thirteen thousand volts can jump to ground and cause an explosion. When corona occurs adjacent to two or more pieces of cable also carrying 13,000 volts, it could blow to one side or the other and affect one or both cables. If three cables are affected and go to a good ground things can get really bad," Wilcox continued. "With that kind of voltage, the arc or electrical spark that's created, is estimated to be between 20,000 - 50,000 degrees Fahrenheit. The steel cabinets that house these connections would be completely vaporized. It can burn up a $50,000 transformer or blow out the back of a building. Worse still, it has the potential to take human life."

At the same glass manufacturing facility, PMG used the ultrasonic instrument to uncover three additional problems: corona inside the stress cone; corona outside the high-voltage cable leading into the stress cone; and corona on another transformer (a dry one that would have cost $30,000 if it had to be replaced).

Inspecting Bearings for Wear

Although Wilcox's focus is primarily centered on electrical systems, he occasionally uses ultrasonics and infrared thermography to monitor bearing wear. "The only accurate way to check a bearing is to listen to it go through its cycle," said Wilcox. "The ultrasonic instrument tells me if the bearing is under lubricated or over lubricated. If it's undergreased, the bearing wears unevenly and, over a period of time, generates a good deal of heat. Infrared thermography confirms my diagnosis."

According to Wilcox, master engineers have found that there are three distinct cycles of a piece of rotating equipment as bearings start to deteriorate. First, as a bearing shows signs of wear it gives off an ultrasonic signal. As it worsens, the ultrasonic signal becomes louder. In phase two, the equipment begins to vibrate. As that condition exacerbates, heat begins to build, which is detected with an infrared instrument.

Unfortunately, if a bearing is allowed to reach this stage, it already has damaged the shaft.

Using both ultrasonics and infrared technologies, PMG recently helped another manufacturer save thousands of dollars in wasted energy because of faulty bearings. "In one section of the plant, the company had been spending $147,000 a year in electricity and fuel. Once we identified the problem bearings and repairs were made," Wilcox concluded, "the cost of energy dropped to $69,000." **ET**

CORPORATE CONTRIBUTIONS

GE Power Management

Utilities networking for profit with enerVista.com

Utilities today are undergoing a dramatic shift in the way they do business. Mergers and acquisitions are driving the need to increase service as well as reduce operating costs. As a result, business models are changing as utilities are forced to seek profitability through alternative methods.

Some of those opportunities lie beyond traditional geographical boundaries, customers and even core competencies. But with the right technology, it is now much easier for utilities to break down those traditional barriers and operate successfully in a global market. One way of achieving a new level of profitability is by leveraging the power and flexibility of one of the most pervasive and cost-effective communications media around — the Internet.

We have already witnessed how the Internet has had a dramatic impact on day-to-day operations in the world of business and commerce. There is no question it has been a powerful force in leveling the playing field, increasing internal efficiencies, improving profitability, and breaking down the barriers to doing business.

The utility world can now realize the same gains. The convergence of Internet access from PCs, servers and Internet ready IEDs (Intelligent Electronic Devices) has made it possible to perform substation monitoring and control, as well as administration functions, at an affordable rate. More importantly, this functionality can be applied to a utility of any size or at any technology level. In fact, we are already witnessing a number of sites in Ontario and the U.S. making use of the Internet for a variety of substation related functions.

These are the sites that have adopted a revolutionary concept from GE Power Management called enerVista.com — a totally new utility management model that allows utilities to manage substation operations through the Internet from any PC-based device, including desktop systems, laptops, handheld devices or cell phones.

enerVista.com is a suite of Internet-based services created to address the challenges of today's competitive marketplace.

enerVista.com is a suite of Internet-based services created to address the challenges of today's competitive marketplace.

What makes enerVista.com unique?

Unlike more conventional 'portal' offerings that allow on-line monitoring of SCADA systems, enerVista.com is a much more comprehensive utility management system 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.

enerVista.com keeps customers informed of problems at the station 24/7 with configurable automated alarm notification via phone, pager, or email.

With enerVista.com utilities, for a monthly fee, can log onto a comprehensive utility management system, and use GE Power Management's highly secure hardware and software infrastructure to access information and manage their business operations, thereby reducing expenditure, manpower requirements and infrastructure costs.

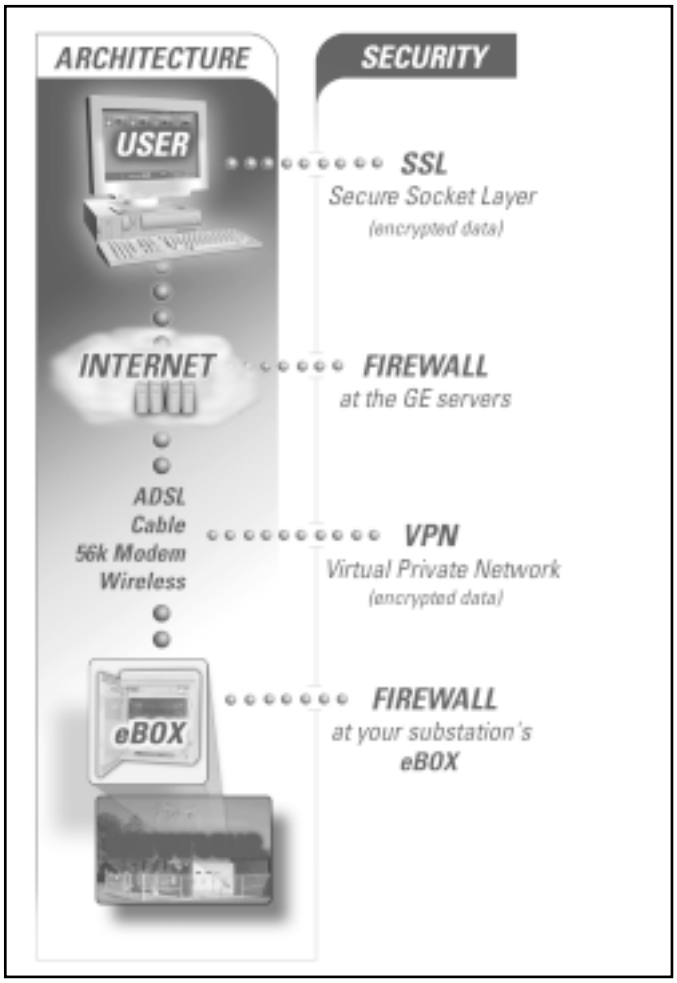
Through the use of SSL (Secure Socket Layer), firewalls, and VPN (Virtual Private Networking), enerVista.com keeps customer data secure.

enerVista.com is made up of a number of subscription-based service 'modules'. Monthly costs vary depending on the types of services required and number of substations. Collectively these services provide many of the services of a complex enterprise management system without the need for a SCADA-size budget.

enerVista.com keeps customers informed of problems at the station 24/7 with configurable automated alarm notification via phone, pager, or email.

enerVista.com modules include:

- eSCADA (includes eMONITOR, eCONTROL, eENGINEER) that utilizes GE Power Management's Universal Relay (UR) IED installed with a modem in an enclosure at the site as an Internet appliance for 24/7 protection, monitoring and optional control of all substations from a PC-enabled device.
- eEXPERT, a comprehensive database of public documents and Internet links to other websites of standards, application papers, notes and diagnosis guides.
- eREPORTER for automatic generation of reports from collected or manually entered data.
- eSCHEDULER for automating repetitive manual procedures.
- eADMINISTRATOR for tracking all equipment for the entire utility distribution network.
- eLIBRARY for online document access.
- eCUSTOMER to allow small utili-



Through the use of SSL (Secure Socket Layer), firewalls, and VPN (Virtual Private Networking), enerVista.com keeps customer data secure.

ties that currently do not have a website to communicate directly with their customers over the Internet.

With enerVista.com, utilities can compete more effectively; reduce administration, manpower and technology costs; improve productivity; and enjoy all the benefits of world class substation management functionality.

As enerVista.com evolves, we continue to see new developments. Some of the enerVista.com applications that are currently being used include remote monitoring and control, pager and voice mail notification, and webcam operations for perimeter surveillance.

The potential for this type of service does not end there. enerVista.com can easily extend beyond integrating substations at remote sites to perform other functions or to serve other industries. enerVista.com can also be used to create additional revenue streams for utilities that already have 24/7 control room systems. With a simple 'feed', a utility can provide remote customers with on-line expertise as a value added service.

The beauty of a Web-enabled solution is, there are no geographical boundaries. A utility 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.

With the flexibility and power of the Internet, the possibilities are endless.

CORPORATE CONTRIBUTIONS

3M Canada

Working with Electric Utilities Around the World for Over 50

3M's Electrical Products Division has been working with electrical utilities around the world for over 50 years developing leading edge technology in splicing and terminating electrical cables. 3M pioneered the use of cold shrink delivery systems and silicone rubber materials technology in the utility industry to provide customers with the safest and easiest-to-install cable accessories on the market.

For more information about the products available from 3M's Electrical Division please visit the website at www.3M.com/elpd

3M

CORPORATE CONTRIBUTIONS

Lasik Vision

Quality, Results, Experience ...THE BEST IN SIGHT

Here at Lasik Vision, our staff spent the year 2000 building on our position as the world's leading provider of laser refractive surgery and striving to provide affordable, quality care to every one of the many people who require LASIK (laser in-situ keratomileusis) or PRK (photorefractive keratectomy). As of December, the expert surgeons throughout our 29 centers had performed more than 180,000 procedures, adding daily to the number of people across North America whose lives have been changed for the better by laser refractive surgery. Industry wide, approximately 1.5 million refractive procedures were performed in North America in the year 2000 alone, and the popularity of laser eye surgery continues to grow rapidly.

In addition to performing more procedures than any other laser eye surgery provider, we are continually drawing on the knowledge that we have gained as pioneers in this field. Experience does make a difference: our patients enjoy visual outcomes that are second to none in the industry, with 99.8% of mildly myopic (nearsighted) patients achieving lens-free driving ability after a single treatment, and the vast majority attaining 20/20 vision.

As part of our goal to provide quality care to every person who requires it and who can benefit from it, we place special emphasis on safety and on maximizing the best possible outcomes for each individual patient. For that reason, we employ a rigorous, thorough pre-operative screening process which includes a general refraction test to measure your prescription, dilation in order to examine the retina and the health of your entire eye, and last but not least, an Orbscan(. The Orbscan(produces a 3D map of the curvature and elevation of both the front and back surfaces of the cornea, measuring the thinnest part of the cornea with a precision unparalleled by any other instrument. Worldwide, less than 5% of surgeons performing LASIK utilize this technology, which our surgeons believe is absolutely necessary for determining if you are eligible for laser vision correction.

In addition to our complete pre-screening procedure, we also ensure that each and every one of our centers uses only the most advanced technology available. In our Canadian centers, this technology includes the Bausch & Lomb Technolas 217C excimer laser, a fourth-generation spot scanning laser. The Technolas 217C has an active tracking mechanism which follows any movement of the patient's eye, ensuring that the laser will stop in the event of movement that may adversely influence optimal results. This generation of laser is able to treat a much wider area of the cornea than was previously the case, which has resulted in a significant reduction in night vision disturbances such as glare or haloes around lights. Our lasers have been thoroughly tested, clinically proven, and are maintained at standards that exceed the manufacturers' protocols.

Delivering quality care is a goal that we fulfill every day, and we plan to spend the New Year, and every year after, devoting ourselves to that mission. We invite you to visit any one of our centers and see for yourself the difference that a commitment to quality makes.

CORPORATE CONTRIBUTIONS

Optimum Energy Products Ltd.

ETAP® PowerStation, leading edge 32-bit power system analysis software from Operation Technology Inc. and Optimum Energy Products Ltd.

Operation Technology, Inc. (OTI) is the global leader in power system analysis software, with offices and agencies in more than forty countries. Incorporated in 1986, OTI has widespread experience in the design, analysis, and operation of electric power systems. OTI was the first to develop electrical power system analysis software to be approved for use in high-impact (nuclear) applications.

One of the essential products developed by OTI is the ETAP PowerStation software. PowerStation was the first true 32-bit power system analysis program for Microsoft Windows. PowerStation is designed for the Windows 95, 98, NT, Me, and 2000 operating systems and contains many advanced features including ODBC, multi-dimensional database, composite network nesting, and more.

OTI developed PowerStation Management System (PSMS) to provide online (real-time) monitoring, simulation, control, and supervisory control capabilities. PSMS uses real-time data and system topology (PowerStation database) to estimate unmonitored power flows and voltages throughout the system.

Along with aggressive development and product maintenance, OTI utilizes a highly specialized team of engineers known as the Power Solution Division that conduct research and development projects as well as system studies. The combined knowledge of our qualified staff exceeds 100 years of solid engineering, design, and system analysis experience.

OTI has grown to include specialized consultants, design engineers, cutting edge programmers, and an experienced sales staff. OTI will continue to meet its clients' needs by incorporating the latest advances in technology into both software development and engineering services.

OTI is especially proud of our latest PowerStation Release 3.0:

Bill Wooton, Senior Vice President of Development for OTI, stated, "PowerStation 3.0 represents our latest thinking on what an Electrical Analysis Program should be. Sophisticated and powerful new features, such as the new composite networks and the ability to construct mixed AC-DC networks, are used to simplify the user interface. In response to user requests, we have added the ability to merge PowerStation databases and new capabilities for the printing and plotting of one-line diagrams. Numerous cutting edge software technologies have been used to implement these new features."

Vice President of Engineering, Jun Qiu, added, ìThe utmost objective in developing ETAP PowerStation is meeting our users' needs. Several advanced calculation modules, including Harmonic Analysis, Optimal Power Flow, and Generator Start-Up with variable frequency system models, have been added to ETAP PowerStation 3.0. The new DC system program, which includes load flow, short-circuit, and battery sizing calculation capabilities, allows users to model AC and DC systems interconnected in one single project. These new modules bring even more unique features to PowerStation as an analysis tool for power engineers. We sincerely welcome suggestions and comments from our users and will continue to provide our clients with superior products and service by maintaining the highest quality standards."

PowerStation and PSMS are available in Canada from our Authorized Country Distributor, Optimum Energy Products Ltd. of Calgary, AB. Contact Grant Meadows toll free at 877-766-5412 or visit www.Optimum Energy.com. Optimum also has representation in Ontario through Virelec Ltd. Contact Paul Marot at 905-569-8030 or www.Virelec.com.

CORPORATE CONTRIBUTIONS

Eaton's Cutler-Hammer

Getting Familiar with your Electrical System is the Key to Preventing Power Failure

By Phil Jones, National Sales Manager
Eaton Corporation's Cutler-Hammer Engineering Services and Systems (C-H ESS) Group

Just think, only 10 years ago we had never heard the term "dot.com," we couldn't imagine that the government would ever agree to deregulate electrical generation, and we didn't think the term Power Quality really meant anything. As we enter the true new millennium, we have learned that even in an old-school business like electrical distribution, technological advancements are happening at a ferocious speed. Our strong-as-steel power systems that we so proudly built yesteryear have weakened, barely able to support the electrical loads of today's business campuses and facilities. What happens when the system crashes? Aren't crashes inevitable?

The solution is this simple: facility managers and/or maintenance engineers must take an objective look at what they expect from their existing power system. If requirements are unrealistic, there's a pretty good chance the system is going down. When it does, productivity goes right along for the ride. Horror stories abound of accountants calculating the money lost every second the operation is down. Inevitably, someone asks the question, "Could this have been prevented?"

One of the great things about living in this advanced age is that no one needs to be in the dark anymore (pardon the pun) about preventing such disasters; they aren't inevitable. Having your power system tested and monitored will ensure that it is protecting your plant, equipment, and people as reliably as it did when it was first installed. In essence, you need to get intimate with your system.

Through power system studies, you are able to enhance system performance and bring to light electrical deficiencies and potential hazards. Tests are run to analyze reliability, power quality, and energy management. Preventing future system distress and creating a safe power environment that will be both economical and electrically sound is the primary reason for initiating predictive maintenance. Power systems should be evaluated at other times, such as when you are upgrading to a new distribution system, adding additional loads or processes to the current power system, or contracting with a utility. Power and energy management studies can be conducted during normal plant operation, or, in more complex situations, during the annual plant shutdown.

Individual studies target precisely defined power issues, using in-depth analytical tools in combination with the most advanced testing and monitoring instrumentation. Data is gathered for incorporation into a computerized database that enables a review of instantaneous "snapshots" of real-time system status, as well as dynamic historical trends and simulated future scenarios.

Advanced on-line assessment methods can diagnose the condition of insulation and detect electrical problems within the operating equipment. Things that used to be considered electrical anomalies are now fully understood and can be rectified before they cause problems. A smart sensor was invented to detect partial discharge on medium voltage rotating aparatus, transformer bushings, and medium voltage switchgear. Valuable information about the equipment's condition allows optimal and timely predictive maintenance actions to prevent insulation breakdown and equipment failure.

The trifecta of a power system's enemies - harmonics, surges, and sags, are much more hazardous in today's digital age. Harmonics are the culprit for creating dirty power and spreading it to other utility grid users. Today, harmonics detectors can be embedded into circuit breakers, switchgear, and other electrical controls. By analyzing the incoming and outgoing power, harmonics and their origins can be detected before severe damage is done. When too many machines are started at once, voltage sags can lock up computers, freeze PLCs and, most dangerously, black out the factory. Every minute your system is down hundreds of thousands of dollars are at stake. Traditionally, generators were used to provide back-up support once a voltage sag hit. Now, motor starters can be installed, helping equipment ride out sags without failing. These starters can even offer protection to certain kinds of equipment. Surges and transients can cause disturbances ranging from data-transmission errors to all out production stoppage. Surges, just like their counterparts harmonics and sags, can be mitigated with the right protective equipment.

Most of the time the answer is, "Yes, this could have been avoided." Once you get to know your system, its capabilities, and its weaknesses, you can provide the right type of protection against the most common electrical hazards. By instituting on-line system monitoring, real-time system performance is always at your fingertips – voila predictive maintenance!

Whether you prefer, "an ounce of prevention is worth a pound of cure," or, "measure twice, cut once," the proactive approach is the one that will save you time, money, and worry.

For more information on power quality, or questions on this editorial, write Phil Jones @ JonesPS@ch.etn.com

Cutler-Hammer

CORPORATE CONTRIBUTIONS

SoftSwitching Technologies

Protection Against Power Quality 'Events'

By Dr. Deepak Divan, Fellow IEEE
President and CEO, SoftSwitching Technologies

As global competition and a gyrating stock market pressure management, squeezing additional profits out of an established industrial process can spell the difference between success and failure. Poor electric power quality, as manifested by voltage sags (dips) and momentary interruptions (blinking lights), results in equipment and process downtime costing US industry an estimated $150 billion dollars each year. The highest costs accrue to the high-tech automated industry sectors, the very foundation of the new digital economy and US industrial growth.

Industry sectors with the highest cost of downtime include semiconductor, fiber-optic cable, and automotive manufacturing, as well as other continuous manufacturing process industries such as plastic extrusion, paper, food processing, and CNC machining. While UPS products are widely deployed as a solution in the PC and computer server markets, they have been difficult to apply in demanding industrial applications. As a consequence, the manufacturing sector has lacked an effective solution to the most common power quality problems or 'events'.

Power quality 'events' most frequently result from unanticipated faults on the utility grid caused by occurrences such as lightning strikes, cars driving into utility poles, animals intruding into utility equipment, and equipment failing in a utility customer's premises. Even when a utility's protective fusing and breakers operate as designed, a severe fault condition will exist for a few cycles until the fault is cleared. It is precisely during this short interval, typically less than 3-10 cycles and perceived by human senses to be no more than a momentary flicker or blinking of the lights, that today's digitally-controlled equipment and manufacturing processes shut down. Very frequently, the utility and their affected customer are both victims of circumstances beyond their control.

High-value industrial customers, such as semiconductor and automotive manufacturing plants, are fully aware of the power problems and frequently require their utility to either connect them to a 'premium' (transmission) grid at voltages of 120 kV or greater, or provide dual independent distribution utility feeds. For these high-value customers, virtually all power 'events' are of very short duration, lasting less than 1/4 second each. However, the vast majority of customers (i.e., those fed from the distribution grid) are less fortunate. This is supported by EPRI's Distribution Power Quality study which concluded that over 92 per cent of all power 'events' are of short duration with only one or two events per year lasting for over several minutes.

It has been proposed that the utility's performance or the utility reliability metrics be measured by the proportion of the time the utility voltage is out of its normal range during a year. This is described in the form of 'nines' for example 99.9 per cent represents 3-nines. Nevertheless, a more effective measure is the proportion of time during a year that a process is down as a result of a power quality event. For instance, if a 1/4 second power 'event' caused a customer's machine to be down for 2 hours, then did the event last for 1/4 second or 2 hours? The answer is 2 hours. The reliability level effectively experienced by the premium grid customer is therefore decreased from over 7-nines (99.99999 per cent) to approximately 2-nines (99 per cent). For a normal grid customer, the reliability effectively decreases from 4-nines to 2-nines. One can see that for digital economy processes, the impact of power quality events is severe and significant.

The DySC™ (pronounced disk) from SoftSwitching Technologies, rated at 1.5 kVA to over 2,000 kVA, specifically protects sensitive equipment and manufacturing processes from deep voltage sags and momentary interruptions, the most common power quality 'events'. The DySC is internationally patented, features 99.5 per cent efficiency, has no batteries or energy storage coils, and has smaller size and lower cost compared with conventional solutions, and is specifically designed for demanding industrial applications. Particularly in 'premium' utility grid applications, the DySC protects against virtually 100 per cent of all power quality events, resulting in a very high level of nines. Even in 'normal' grid applications, the DySC covers against over 92 per cent of all events.

The DySC is a mature product, currently protecting critical processes for blue chip customers in the semiconductor, automotive, and fiber-optic cable manufacturing industries. It is also being applied in other mainstream applications including plastics, food processing, cement, steel, HID lighting, and for computer systems. Visit SoftSwitching's website at www.softswitch.com or call us at 608-836-6552 for further information.

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YEAR-IN-REVIEW FEATURE

Year 2000:

Another Year of Progress and Change for Canada's Electric Utilities

BC HYDRO

While BC Hydro offers its customers among the lowest residential, commercial and industrial rates in North America, it is also responding to its customers' need for a company that is as smart about creating power as it is about using power, and is planning ahead for the future.

Commitment to the Environment

BC Hydro renewed its commitment to clean, green renewable energy with an update to its Integrated Electricity Plan in 2000, which has set a target that ten per cent of all new generation resource acquisitions will be new green resources. This plan is reinforced by the installation of three wind monitoring towers to determine the viability of wind as a generation source in the near future, as well as investigations into wood-waste, micro hydro, hydrogen and community energy planning.

Greenhouse Gases Offset

To assist in maintaining BC Hydro's status as a low-emissions power supplier, BC Hydro purchased its first greenhouse gas (GHG) offsets from a Lower Mainland company. The ongoing upgrade of its Burrard Generating Station is also decreasing GHG emissions by increasing plant efficiency.

Customer Service

To provide better information to BC Hydro customers during power outages, a 1-888-POWERON number was introduced. By calling this number customers are able to find out when the power will be restored and the cause of the outage. The system is planned to be extended province-wide. Operating hours at call centres have been expanded and are now providing service in six languages: English, French, Mandarin, Cantonese, Hindi and Punjabi. Bill payments can now be made through bill payment machines at Power Smart Centres, 19 Pharmasave outlets, at government offices, and online.

Near right:
Michael Costello
President and CEO,
BC Hydro

Far right:
J.R. Frey
President,
ATCO Electric

Water Use Plans

BC Hydro's Water Use Planning Process is underway for 11 facilities across the province, with the plans for Stave/Ruskin and Alouette facilities already completed. Water Use Planning is part of an overall review of BC Hydro's licences to store and divert water for electricity generation. The plans are being developed in collaboration with the Ministry of Environment, Lands and Parks; the Ministry of Fisheries; Fisheries and Oceans Canada; local governments; First Nations; community groups and other stakeholders.

Georgia Strait Pipeline Crossing Project

BC Hydro is working on a joint venture with Williams Gas Pipeline to build a new natural gas pipeline to Vancouver Island Community consultation is completed and a tentative route has been submitted to the National Energy Board. BC Hydro is supporting a full panel review of the project. The new pipeline would help provide fuel to existing and proposed generation plants to meet the growing electricity needs on Vancouver Island.

ATCO ELECTRIC

Alberta government's restructuring of the provincial electricity industry provided the framework for much of ATCO Electric's work in 2000. As of January 1, 2001, all customers in Alberta will be able to choose their energy supplier.

ATCO Electric has a clear vision of its role in the new world — to deliver electricity over a safe, reliable system of power lines. As a delivery company, we will meet the growing need for facilities in our service area and continue to pursue excellence in the transmission and distribution of energy. Under the new structure, ATCO Electric will also provide a "regulated rate option," allowing most customers to continue buying the full electric service package. This means we continue to buy energy on behalf of the customers who have not chosen a retailer.

In September, ATCO Electric filed an application outlining its proposed approach to buying energy for the regulated rate option with the provincial Energy and Utilities Board (EUB). This was the latest step in a year filled with regulatory proceedings as the province prepares for industry restructuring.

In April, ATCO received approval from the EUB for a new rate structure that moves towards clear separation of the costs of energy and delivery. In July, we submitted an application for a distribution tariff — i.e., the delivery charge that will recover the costs of providing transmission and distribution service. In October, ATCO Electric successfully reached a negotiated settlement with customer groups on revenue required to cover its transmission costs. We are also working with customers on a negotiated settlement related to our distribution revenue requirement.

Another important aspect of industry restructuring has been how to move existing utility-owned generating plants

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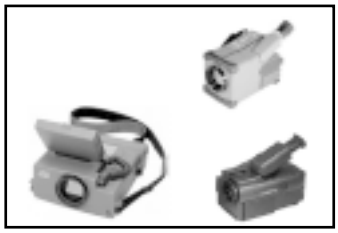

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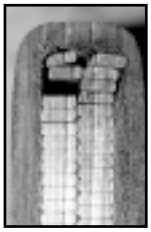

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