

Electric ENERGY T&D

M A G A Z I N E

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The Need for Investment Becoming Critical**

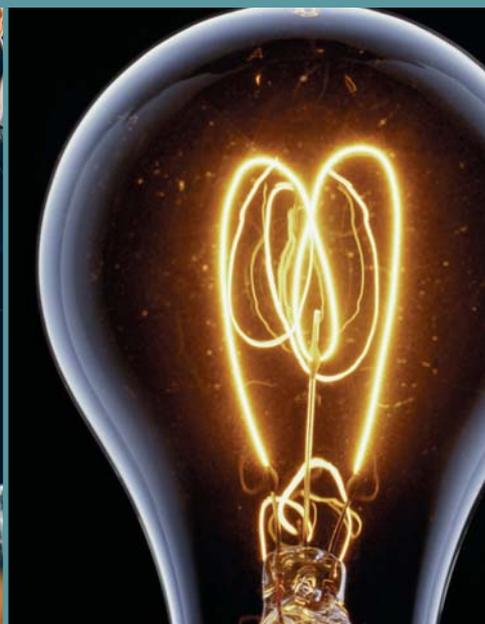
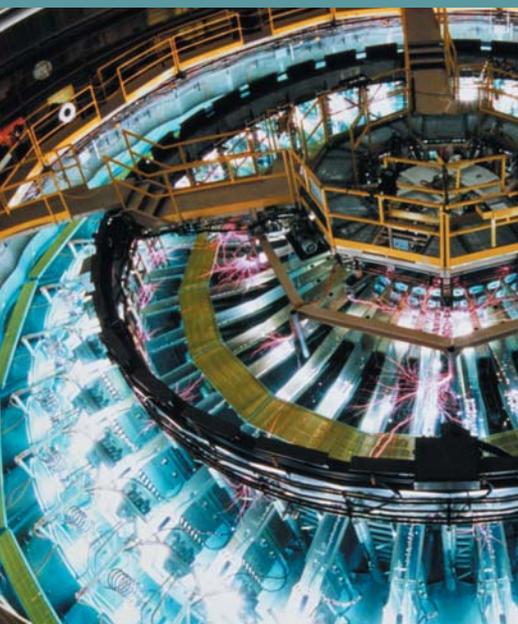
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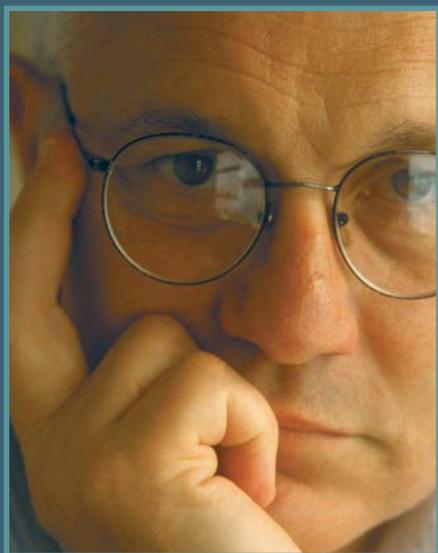
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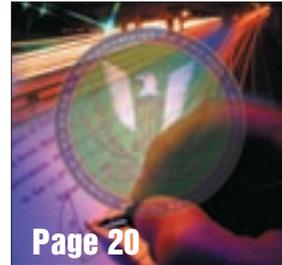
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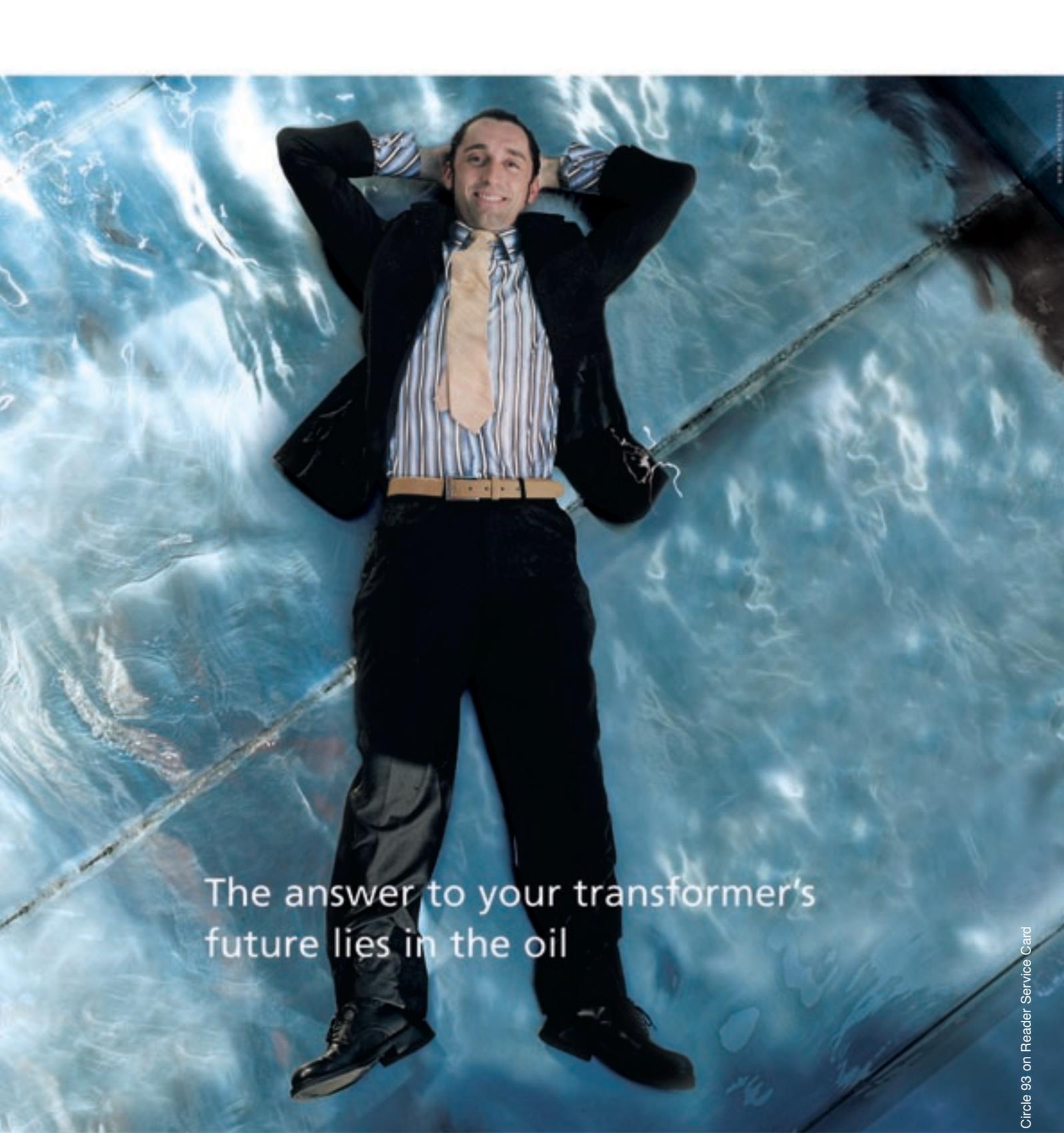
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A man in a dark suit, striped shirt, and yellow tie is floating in space. He has his hands behind his head and is smiling. The background is a view of Earth from space, showing blue oceans and white clouds. The man is positioned centrally, with his body oriented vertically.

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Canadian Energy Patch on the Same Page: The Need for Investment Becoming Critical

By: Francis Bradley, Vice-President
Canadian Electricity Association, bradley@canelect.ca

It's not often that a large number of disparate organizations agree on the fundamentals, but such is the case in the Canadian energy sector. Twenty energy associations, representing the up- and down-stream of oil and gas, electricity, nuclear and alternatives, have been working cooperatively to seek public policy action to facilitate the urgent need for investment in the energy sector. The informal group, calling itself the Energy Dialogue Group, shares concerns regarding Canada's energy future and, given the supply and demand picture over the next two decades, on the ability to ensure the future prosper-

ity of the Canadian economy. The Energy Dialogue Group has been engaging Canadian federal and provincial policy makers in a review of both the future supply/demand orientation, as well as suggesting policy options that should be considered.

The energy sector has long played a crucial role in underpinning the competitiveness of the North American economy, and in assuring the quality of life expected by our citizens. Abundant supply, relatively low prices, and reliable delivery systems are the result of decades of capital investment that created thousands of jobs in

communities from coast to coast to coast. However, our successes of the past are not guaranteed into the future as we move from yesterday's opportunities to confront tomorrow's challenges. Mobilizing the very large amounts of capital required to ensure future prosperity will require policy coherence, regulatory coordination and efficiency, and an attractive fiscal regime. Given those conditions, the challenges can be turned into opportunities, and the energy sector can continue to deliver its historic advantage to citizens.

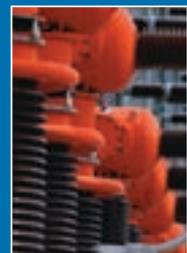
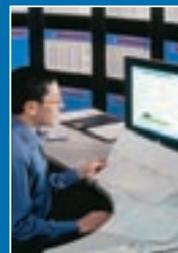
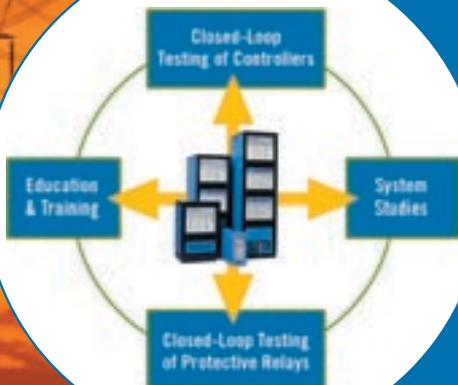


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As North America contemplates its energy future, it does so in the context of rising and more volatile energy prices, declining productivity from conventional low-cost energy supplies, the need to access resources from more remote and costly regions, and meeting ever more stringent environmental requirements. At the same time, the appetite for energy remains undiminished. For example, growth in Canadian demand is projected to rise between 30-40% over the next 20 years.

In the case of oil and gas exploration, finding and development costs for conventional oil and natural gas, and capital and operating costs for oil sands and unconventional gas continue to escalate dramatically.

The need for investment in new production, transmission and distribution infrastructure over the next 30 years is estimated by the International Energy Agency (IEA) to be in the range of US\$1.7 trillion in Canada and the United States and roughly US\$10 trillion globally for the same time period. This latter reality is important in that it will create strong competition within global capital markets, making it vital for the optimization of investment conditions. As the IEA explains, "The energy-investment challenge is heightened by the fact that capital needs in the next thirty years will be much bigger in real terms than over the past thirty years."

One of the reasons capital needs in the next 30 years will be significantly greater than the past 30, is that we are approaching the end of the lifespan of a very large stock of infrastructure built between 1950 and 1980. The post-war boom meant energy consumption grew at an exceptionally high rate and led to a wave of major developments such as hydro mega-projects, the first round of nuclear facilities, the vast expansion in conventional oil and natural gas exploration, and development of associated transmission and distribution facilities. In Canada, much of this capital was financed from public budgets. As the IEA notes, the private and foreign capital that has replaced public financing is very sensitive to the nature and stability of government policies.

In the case of electricity, Canadian capital expenditures from 1980 to 2000 fell by roughly two-thirds. Although oil and gas investment tripled and will likely climb to historically high levels, new reserves are increasingly high-cost and high-risk. In essence, we are living off the capital of an earlier era, much of which will now need to be replaced.

This means that not only must we build to meet future demand growth and the needs of customers in the future; we must also replace much of the production, transmission and distribution capacity built over the last 50 years. The IEA estimates that 51% of energy production investment will be needed to replace existing and future capacity over the next 30 years.

In the case of oil and gas exploration, finding and development costs for conventional oil and natural gas, and capital and operating costs for oil sands and unconventional gas continue to escalate dramatically. On the electricity front, new projects will be more expensive due to environmental mitigation costs, distance, technology complexity and/or higher resource input costs. All of which point to rising costs for energy.

North America as a prospective destination for energy investment is attractive based on the large and affluent market it represents. Canada's ability to draw an appropriate share of that investment rests in its resource endowment, which remains considerable, and the conditions perceived by investors that differentiate it from opportunities in the U.S. or even Mexico. As noted earlier, investment prospects will be in more costly and remote sites, and the historic comparative advantage enjoyed in the production of electricity, and the development of conventional oil and gas reserves are no longer as pronounced as they once were. The recent increase in value of the Canadian dollar relative to the U.S. has further amplified the effects of that change.

The bottom line is that investors will be faced with a wide array of potential opportunities, all of which will be affected by policy, regulatory, environmental and security considerations that will add a significant additional degree of complexity and uncertainty to decision-making. To be successful, we need to be able to clearly define our advantages to potential investors.

For capital markets to view projects in a positive light, a number of important factors need to be aligned. To begin with, the overall policy framework for the energy industry needs to be clear, sensitive to investors' priorities, and stable. A reaffirmation of our market-based model and a fully functioning continental marketplace within North America is a key starting point. The Canadian market itself is too small to fully justify the extraordinarily expensive major projects underway in the oil sands and remote northern and offshore oil and gas fields. Similarly, major electrical generation projects, particularly hydro and nuclear, require significant regional markets to allow for a sharing of risk and a phasing-in of domestic consumption for the output of large blocks of power. In this context, Canada is an integral part of the overall North American marketplace for both energy and investment.

Finally, the returns on investment offered by projects must be competitive with those offered globally if we are going to attract the investment required to develop our energy infrastructure. Returns required will vary depending on the level of success achieved in establishing an appropriate policy framework, consistent and stable market rules, efficient and effective regulation, and finally, the relative risk perception for investment in a global context.

The Energy Dialogue Group believes Canada must be seen as an attractive destination for investment, if Canadian projects are to compete for the capital necessary to finance our future energy needs, and to play a full role within North America and internationally. If our policy and regulatory processes are clear, efficient and effective, our many other features will ensure we are a destination of choice for energy investment. As we look into the future, we see significant challenges with respect to ensuring the adequacy and affordability of our energy resources. If we do not succeed in attracting the necessary investment to finance tomorrow's energy projects, the economy and our citizens' well-being will be placed at risk. Therefore, it is only prudent that we embark on a process to identify precisely what needs to be done to ensure that we are the destination of choice for energy investment. ■

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Avistar Introduces AP-10 Phase Identification System

Technology innovator's latest product identifies phase, phase angle on energized conductors within seconds

Albuquerque, NM — The August 2003 blackouts underscored the importance of transmission and distribution (T&D) system reliability. Avistar Inc., a subsidiary of PNM Resources (NYSE: PNM), has released a tool that can speed up many of the tasks associated with T&D maintenance: the AP-10, a fast, simple phase identification system for field use.



Utility engineers and contractors need phase information for a wide variety of projects, ranging from system improvement to expansion for new housing developments. By quickly identifying the phase at a specific point of interest, for example an overhead power line, the AP-10 offers tremendous speed and convenience compared with traditional phase-determination methods, which have required either deenergizing the lines or visually following the three lines (phases A, B, and C) from a substation while driving a crew truck to the point in question. Replacing this error-prone, costly practice translates to productivity gains and significant cost savings, and even puts many previously infeasible assessment and improvement projects within reach.

The AP-10 identifies phase and phase angle on all overhead conductors, such as power lines, and on vault and pad-mounted switchgear. The system handles 120 volts to at least 345 kilovolts and features a rugged, field-worthy design that allows easy one-person operation.

Beta and pre-commercial versions of the AP-10 have been in use since early 2003 at several utilities around the United States. Completed and anticipated uses include system mapping and verification, electromagnetic field modeling, phase verification on automated distribution switches, underground system expansion, and phase identification where underwater line extensions resurface.

The AP-10 has just three components: a reference unit, kept at a substation; and a field unit and hotstick unit, which go to the job site. When touched to a live conductor, the hotstick unit transmits a reading to the field unit, which then calls the reference unit using a built-in cell modem to perform the phase calculation and provides successive phase readings in seconds each. When out of cell range, the field unit stores a reading to let the user drive to cell range, then automatically dials the reference unit and completes the phase calculation. The field unit's high-visibility LEDs, LCD text display, and distinct 80-decibel beep patterns make the phase declaration easy to discern in the field.

The AP-10 is based on Avistar's patented About-Phase technology. More information about this technology and the AP-10 system, including a live-action video that demonstrates the system's realtime operation, is available at the company's website: www.AvistarInc.com/AP10Now. ●

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Data Comm for Business, Inc. - New Product Announcement:



The IP-6600 is an industrial rated router featuring two serial ports and two Ethernet LAN ports.

Since each Ethernet and serial port is independent, the router has many uses in addition to the commonly used dial-in, dial-out and asynchronous LAN connection modes.

The two RS232 serial ports operate at asynchronous speeds as low as 300 bps and as high as 230 Kbps. They may be used to link two separate remote sites with leased or dial connections, one port used for an ISP connection and the second for dial-in, each used for combined dial-in and dial-on-demand dial-out, or other convenient combinations. The two ethernet LAN connections (one operating at 10BaseT and the other auto-switching at 10 or 100BaseT) may be configured on different LAN segments for DMZ routing, firewalling and port/address filtering, or used as a DSL or Cable modem adjunct for Network Address Translation (NAT).

The IP-6600 works well with DSL, cable or dial modems, leased line modems, CDPD or GSM modems, wireless links, satellite modems, the DCB DA-56 DSU, or even simple line drivers.

Routing may be configured between any combination of interfaces with full-featured port or address filtering, port forwarding, and NAT. The same port may even be configured for dial-out using dial-on-demand while accepting dial-in calls from portable computer users. It's easily configured for "stay-online" dial connections.

Configuration is quick and easy using a web browser. The router uses three different configurations... a stored configuration, a working (running) configuration, and a pending configuration. This method allows temporary configuration changes, testing, and remote configuration changes even via a PPP link on the router. Configurations may be saved on a PC for later use, and the config file is editable on a PC.

On-board tools network monitoring and troubleshooting tools include a packet header sniffer, traceroute, ping, and dial tools (force a dial, force a disconnect). Logging may be

configured as standard or with extreme details showing negotiations, modem responses, etc. .

The IP-6600 is rated for industrial temperature applications, from -40 to +70C. It is in a small 4.5" x 5.5" by 1U high enclosure. It can be powered with 120 VAC or 220 VAC external transformers or with 12, 24, 48 or 125 VDC supplies. ●

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White River Valley Electric Cooperative Awards Survalent Technology Scada System Contract

MISSISSAUGA, ONT.

Survalent Technology has been awarded a contract to replace the existing SCADA system at White River Valley Electric Cooperative.

The new Survalent SCADA system is composed of Windows 2003 Server operating system and Dell PowerEdge Servers. Included with the system is the Survalent WorldView GUI site license, Remote Alarm Annunciation, Event Data Recording, System Configuration Status, SCADA Add-in for Excel and Access,



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Transcription, and DNP 3.0 TCP/IP protocol. Survalent Technology will provide a DNP Server application, allowing White River's SCADA master to scan Sho-Me Power G&T (also a Survalent customer) as a DNP RTU.

"White River was faced with an issue we find common in the SCADA industry _ unhappy with their current SCADA system provider, but locked in to a proprietary protocol. In order to change SCADA systems, they believed they would have to replace their RTU's in order to communicate via an open protocol," Mike Bowdle, Vice President of US Sales at Survalent Technology. "Survalent has developed a solution to replace the proprietary protocol RTU's, using our Trapper Station Controller. This significantly reduced the cost of the RTU replacement and virtually eliminated the road blocks preventing them to move forward with open technology and a supplier that will provide superior support."

"We're extremely excited about utilizing our Survalent SCADA system to its full potential." Robert Johnston, White River SCADA Specialist, "By integrating information from our UIA GIS and our TWACS AMR system with the Survalent SCADA system we will be capable of making timely decisions based on accurate real-time information. The resulting ROI developed from these decisions and actions contributed a great deal to this project justification. Survalent's Transcription application made this all possible."

Survalent Technology (www.survalent.com) is a premier supplier of SCADA systems to the utility industry. With 175 man-years of SCADA development experience, Survalent Technology leads the industry in providing customers with superior SCADA solutions and Professional Services. Survalent Technology Corporation has been continuously serving the electric utilities, gas, oil, water and mass transportation industries since 1964.

White River Valley Electric Cooperative (www.whiteriver.org) is headquartered in Branson, MO and serves more than 35,000 customers in portions of Christian, Douglas, Ozark, Stone and Taney counties. ● Circle 132 on the Reader Service Card

Resin Systems Receives Notification of Successful Independent Testing Of Its Sectional Distribution Utility Pole

EDMONTON - Resin Systems Inc. (RSI) (RS-TSX Venture / RSSYF - OTCBB) and its operating division, RS Technologies (RS) today announced that RS has been advised of the successful completion of structural testing of its innovative and revolutionary engineered segmental production distribution utility pole.

The test results confirmed that the RS designed and built structure substantially exceeded the load, deflection and destruction standards required in the United States. Actual specific test results will be included with upcoming technical data sheets provided to utility customers.

All test poles were manufactured at the RS Edmonton plant on new technologically advanced production equipment designed by the Company's engineering team.

These independent tests were a necessary prerequisite requirement for shipments to most major power utility companies in both the USA and Canada as well as globally. All testing was performed independently by EDM International Inc. at its utility industry renowned laboratory and test facilities in Fort Collins, Colorado.

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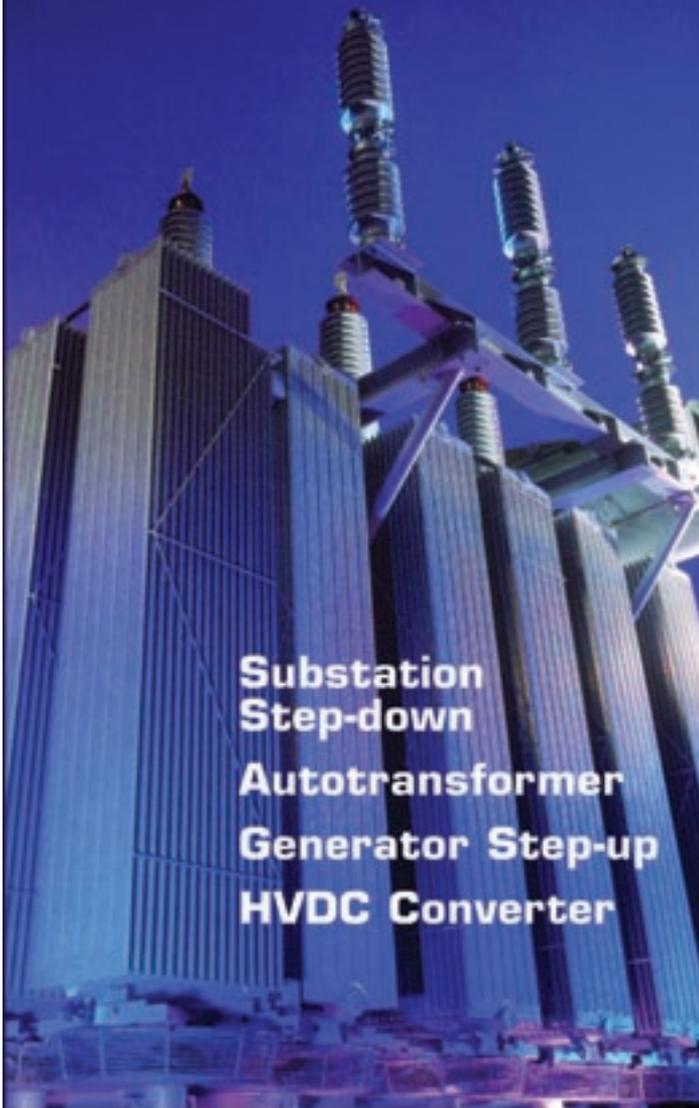
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In addition to the obvious cost-effective benefits of wood most line crews prefer working on a wooden structure for a variety of reasons. Moreau-Grand has the type of service area that requires its crews to climb poles every day. Much of the area served is inaccessible their bucket trucks. When outages occur the member/owners rely on the dedicated 11-man crew to get the lights back on in timely manor. Wood structures afford Moreau-Grand that opportunity no matter what time of year it is.

When selecting a wood people what do you look for? *We have found that the most important issue in selecting wood structures is the quality control of the vendor.*

When we asked Superintendent Larson if Moreau-Grand has ever considered other types of pole structures his comment was simple and to the point. "Wood poles have proven themselves for over 50 years on our system. It just does not get any better than that." ●

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Industry Action, National Legislation Vital to Ensuring Grid Reliability

By: James Fama, Executive Director, Energy Delivery Group, Edison Electric Institute

Last summer's Northeast blackout may have faded from the public's memory, but the power industry remains steadfast in its commitment to strengthening the nation's transmission system.

The industry is addressing the immediate problems that led to the August 14, 2003 blackout, including turning North American Electric Reliability Council (NERC) operating policies into enforceable standards, adding new audit programs, and requiring all transmission owners to annually certify their vegetation management plan.

For the long term, however, a number of issues that threaten the reliability of nation's transmission system need further attention. Principal among these are declining investment dollars and increasing public resistance to siting transmission lines. Beyond endangering reliability, these issues also limit the economic benefits that the country can derive from the grid.

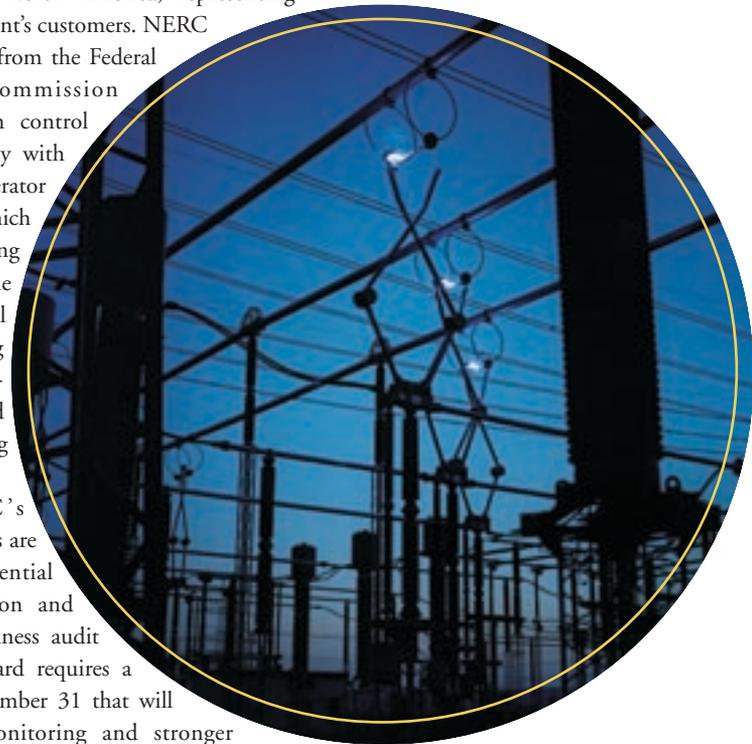
Industry action on these problems is not enough. National energy legislation is necessary to resolve them. Only through comprehensive legislation can the industry and the nation ensure that the grid is reliable enough and strong enough to meet the continually expanding needs of the country.

NERC Actions

In early April, the U.S.-Canada Power System Outage Task Force issued its Final Report on the power blackout. To sum up the findings, the grid needs clearer reliability standards with mandatory enforcement and more independent oversight to protect against blackouts of this scale from happening again.

Earlier this year, the industry-supported North American Electric Reliability Council (NERC) proposed and began implementing a wide variety of measures to address many of the recommendations detailed in the report:

- **Standards**—All existing NERC operating policies, planning standards, and compliance templates will be converted to standards by the end of 2004. In the interim, NERC has approved a package of compliance templates to enhance its audit program and facilitate reporting activities.
- **Control Area Audits**—By June 30, NERC staff will have conducted readiness audits of 20 of the largest control areas in North America, representing the majority of the continent's customers. NERC auditors, assisted by staff from the Federal Energy Regulatory Commission (FERC), will assess each control area's capability to comply with existing policies and operator requirements. Audits, which will take place on a repeating three-year cycle, include assessments of a control area's personnel, training and certification, communications systems, and planning and modeling tools.
- **Reporting**—NERC's regional reliability councils are required to report potential violations for investigation and analysis and submit readiness audit reports. Also, NERC Board requires a recommendation by December 31 that will include performance monitoring and stronger disturbance analysis functions.
- **Public Disclosure**—NERC has approved a set of interim guidelines for reporting and public disclosure of its audits and policy violations. Program specifics will be developed during 2004, but NERC and the industry support clear standards and greater transparency while also assuring due process and confidentiality concerns.
- **Vegetation Management**—NERC's new compliance template will require all transmission owners to certify annually their vegetation management plan and that they have conducted it. NERC will also require reporting of vegetation-related line outages. It will do this while recognizing regional differences and the states' critical role in right-of-way management. As of this writing, NERC will begin consideration of a vegetation management standard by the end of May 2004.
- **Operator Training**—NERC will review its operator training and certification programs, with an eye to developing standards over the next year to specify training requirements, and require all operators to have completed five days of supplemental training by June 30, 2004 on emergency procedures.





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• **Grid Management**—Reactive power and voltage control were two critical aspects of the blackout. NERC will also require reviews and, if necessary, replacements of relay devices on the grid. NERC will revise operating policies to clarify the roles of entities with direct operational controls of the grid.

• **Modeling and Planning**—During the next year NERC will undertake a review of a broad range of system design, planning, and data gathering and management. It will then make substantive recommendations to the NERC Board.

Federal Legislation Needed

While EEI's Board of Directors fully supports NERC's interim measures and encourages FERC to provide an important oversight role to the NERC initiatives, legislative and regulatory policy action is critically needed now to bolster the grid over the years ahead.

Legislation is needed to create a national electric reliability organization (ERO). Only an ERO, with FERC oversight, can develop and enforce mandatory reliability rules and standards that are binding on all electric companies and market participants.

National reliability legislation is also needed to address another fundamental problem with the grid—a continuing decline in investment. Electric transmission infrastructure must be maintained and expanded to meet the increasing demands being placed upon it, unfortunately, investments are not keeping pace with these growing needs.

Investment Declines

In the early 1970s, the annual growth rate in lower voltage line-miles that support localized grid operations and interconnections was 1.9 percent, while the annual growth rate for high-voltage line-miles was 3.2 percent. By the latter half of the 1990s, this relationship had reversed: the higher voltage line-miles were growing at only 0.3 percent, while lower voltage line-miles were growing at 3.5 percent.

Looking ahead, the Energy Information Administration predicts that consumer electricity demand is expected to increase by roughly 50 percent over the next two decades. To meet this demand, investments in transmission must increase from the current level of \$3 billion annually to roughly \$5.5 billion annually over the next ten years.

Because of limited transmission capacity, the regional transmission operators in the PJM region, New York, and New England can transfer only about 5-10 percent of their peak loads between them, which is insufficient to support healthy regional electricity markets in the Mid-Atlantic and the Northeast.

Transmission investment is also needed to enable power buyers and sellers to take advantage of potential economics and increases in resource and pricing flexibility. According to a 2002 DOE study, competition in wholesale electricity markets, however, depend on strong transmission systems to move power to where it is needed.

Siting Difficulties

A number of factors have accounted for this drop in transmission investment. Difficulties in siting transmission lines are key among them. Individual states currently have sole jurisdiction over where to build new transmission lines. And many state siting statutes are focused on evaluating only state needs, thus preventing formal consideration of evolving regional nature of the grid and its role as a critical feature of wholesale markets.

As competitive wholesale electricity markets continue to develop, multi-state regional transmission organizations (RTOs) will operate the markets and may also gain operational control of utility transmission lines. But most state siting laws do not recognize the development of these regional wholesale markets, or the role new entities such as RTOs, regional state commissions (RSCs), and independent transmission companies (ITCs) will play in transmission planning and siting, thus making it almost impossible for the states to conduct fully informed decisionmaking.

Regional electricity markets require a siting process that has the capability to consider regional and even national needs. FERC has jurisdiction over wholesale markets and transmission service, but, unlike its authority to site natural gas pipelines, it currently does not have any authority over transmission siting. Hopefully, RSCs will provide a boost to efforts to site regional transmission lines. National energy legislation can, however, create this regional approach to siting by granting FERC a very limited backstop authority to site transmission facilities, if states cannot or will not act on a timely basis.



Investment needs are reflected in congestion costs within and between regions as well. According to NERC, the volume of transmission transactions has increased by 400 percent in the last four years. Transactions that could not be completed because of congestion on transmission lines increased five-fold to almost 1,500 in 2002, compared with 300 uncompleted transactions in 1998.



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The federal transmission permitting process also needs streamlining. Problems here include a lack of harmony between federal agencies with potential jurisdiction and the tendency by these agencies to require multiple and duplicative environmental reviews. National legislation can streamline the federal permitting process by giving the U. S. Department of Energy lead agency authority for coordinating and setting environmental and permitting process deadlines.

FERC Incentives

Resolving these siting issues will certainly remove significant obstacles to greater investment in high-voltage transmission infrastructure. But energy legislation also is needed to provide incentives for investment. Innovative transmission pricing incentives, including performance-based rates, higher rates of return, and accelerated depreciation, are needed to make transmission investment an attractive alternative to other capital investments.

FERC has offered incentives (Docket No. PL03-1-000, January 15, 2003) to utilities who voluntarily divest their transmission assets and join RTOs, develop ITCs, and invest in the grid. Beyond improving reliability, FERC believes that independent regional grid operation and coordination will reduce wholesale transmission transaction costs, and make electric wholesale competition more effective in ways that benefit all customers.



With an action deadline of December 31st, FERC's proposed incentive policy will reward transmission owners in the following ways:

- 50 basis points to the owner's return on equity (ROE) for transferring transmission control to RTOs
- 100 basis points for investment in new transmission
- 150 basis points for transmission facilities operated within an ITC

Overall, FERC's approach is a good start for spurring investment in the grid. One problem, though, is that by focusing on particular corporate structures, FERC has too narrowly prescribed how independent operation of transmission facilities—the ultimate policy goal—can be achieved. While the industry supports transmission incentives, it believes FERC should focus on rewarding independent behavior, not particular corporate structures, and that corporate structure decisions should be left to each company.

FERC's approach to incentives also suffers from restrictive eligibility rules. Only companies that meet certain requirements and strict deadlines can enjoy the benefits of an increased return on equity in transmission assets. On the other hand, if all new transmission did qualify for the incentive, the cost would be minimal: To finance \$4 billion in new transmission investment (the current yearly average utilities spend on transmission) with incentives under FERC's plan, the dollar equivalent of the incentives would be \$20 million, an amount that would increase the average monthly electric bill by less than a penny. By reducing transmission congestion, investments in new transmission will also enable lower cost power to reach consumers more easily.

Adequate incentives are needed to stimulate transmission construction, but how these construction costs are allocated must be addressed as well. FERC has approached cost allocation issues by seeking to distinguish between transmission facilities built to enhance reliability and facilities built to enable economic transactions.

Transmission lines built solely for reliability benefit everyone, and so there is little disagreement that these costs should be spread over all users. Lines that are built for economic reasons, on the other hand, bring more generators into the market and potentially reduce market prices, but may have little or no benefit to some utility customers. Transmission additions can also, and often do, serve both reliability and economic purposes. Arriving at an equitable cost allocation approach will be complicated, but it is essential for stimulating transmission investment.

One other issue that affects reliability and bears mentioning is the non-participation of municipal electric utilities and cooperatively-owned utilities regarding RTOs. Reliability can be improved if all market participants are subject to the same rules. Under current law and regulation, they are not required or necessarily encouraged to participate in RTOs. They are not subject to most FERC regulations, even though many of them own significant transmission assets, or are otherwise important participants in the wholesale energy market.

Failing to include municipals and cooperatives in regional planning and market operations creates operational holes within RTOs that pose substantial barriers to successful RTO implementation. This is particularly the case in the Northwest and the Southwest, where non-jurisdictional utilities have significant operations. If RTOs are to meet their charge under Order No. 2000 to ensure short-term reliability, manage transmission congestion, and provide for inter-regional coordination, it is essential that all entities within their boundaries participate.

National legislation can also improve reliability by reforming the US tax code. Currently, transmission assets receive less favorable tax treatment than other critical infrastructure and technologies. And electric companies that sell or otherwise dispose of their transmission assets into a FERC-approved RTO or interstate transmission company (ITC) may be subject to tax penalties.

As of May, the Senate had passed the Nickles and Thomas amendment that would revise the tax code to shorten depreciable lives for electric transmission assets from 20 to 15 years. No decision has been made to date by the House leadership on this or the other energy tax issues.

One area where national legislation cannot by itself spur investment in the grid is in the states. To ensure that investment in the grid is adequate to meet the demands being placed upon it, the states must support these measures as well. Twenty-plus states have, as part of retail restructuring, imposed caps, or freezes on the rates paid by retail customers. Such caps and freezes can discourage utilities from investing in transmission since there is no mechanism to recover these investment costs. In other states where restructuring has not occurred, there may not be rate mechanisms in place that will allow prompt and assured recovery of the costs of transmission incentives.

The August 2003 blackout raised many questions about what can be done to improve reliability. The immediate concerns are being addressed. Going forward, national energy legislation, coupled with effective federal and state regulatory policy action, is needed to ensure that the grid can meet the country's growing demands for electricity. America's power companies urge Congress to complete the task. The result will be greater reliability and more affordable power for all customers. ■

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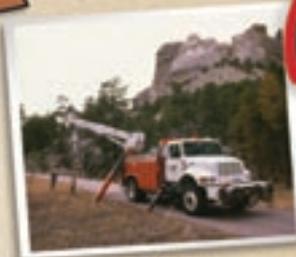
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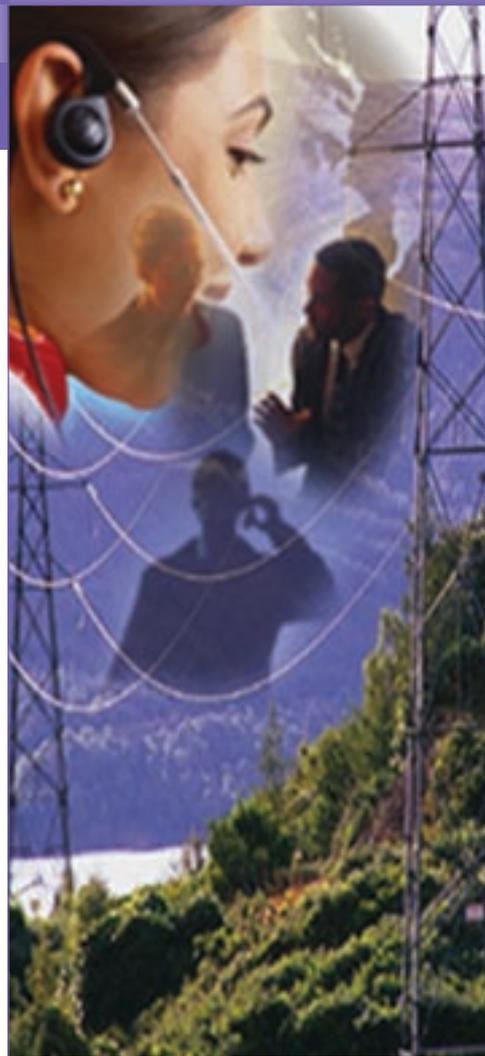
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Energy Industry Must Take Three Coordinated Steps to Minimize Occurrence of Blackouts

By: Damir Novosel, President and General Manager , T&D Consulting at KEMA

As the grid became overloaded and additional lines tripped due to actions of protective equipment, reactive power was consumed and voltages dropped spreading outages throughout the interconnected power. Sequential outages of power system equipment due to overloads, power swings, and voltage fluctuations led to a blackout of large proportions that operators simply could not respond to fast enough.

But the overall blame for August 14 can just as correctly be pinned on a succession of occurrences that took place in the industry over a period of years. First, networks were interconnected to enable support during stressed conditions. However, next came deregulation, which required massive transfers of power from remote locations across the networks in ways the grids were not designed to handle.

Deregulation also tightened operator margins, delaying investment in building new generation capacity, replacing aging equipment and maintaining rights-of-way. Utilities began cutting back on programs as basic as tree trimming and computerized system modeling. As population centers grew, power network became congested with inadequate local reactive support. Each of these elements dramatically increased the possibility that an otherwise benign blip in the network might snowball into a major incident.

With such a precarious situation already in place, the energy industry faces a simple choice – continue applying a patchwork of individual measures to avoid future blackouts, likely with minimal success, or take a balanced approach to fixing the system as a whole by equally weighing the costs, performance impacts and risks associated with each new investment in the system.

To accomplish this, utilities should begin asking themselves how they want the power system to operate 10, 20 and 30 years from now. Within the context of this forward-looking system overhaul, they can also address specific

solutions to reduce the likelihood of outages – because once the overall causes of wide-area disturbances are minimized, the smaller contributing factors are easier to handle, further diminishing the incidence of failures.

Although there is no silver-bullet to completely prevent blackouts, there are three steps that can be taken by electric utilities, industry regulators and local government legislators to deploy a well-defined and coordinated strategy that will defend the power grid network from disruptions.

Audits and Analysis

The energy industry must rediscover the benefits of conducting regular analysis and audits of their networks and components to detect equipment malfunctions and system design flaws that can result in a failure. At the regulatory level, the North American Electric Reliability Council (NERC) has taken the lead in scrutinizing the 2003 blackout and simulating the chain of events to isolate the contributing factors so they can be corrected.

In the course of this study, NERC released a 14-point plan, based largely on analysis and auditing activities, to prevent incidents similar to the 2003 situation. (See Sidebar for the complete list of recommendations.) There are a number of audits being presently done across the country. NERC clearly believes that utilities must make more rigorous and frequent use of widely available software tools to model the management, planning and operations of power grids.

Utilities have models for planning and embedded in energy management systems to study load flows, voltage stability, angular stability and protection coordination, but it is questionable that this is done regularly as network conditions change, that adequate models are used, and that the overall process is properly coordinated with the neighbors.

The North American blackout of August 14, 2003 has compelled the utility industry, government regulators and general public to ask the same question: “How did this happen?” While finding the root cause of a specific event like this offers some benefit in preventing a recurrence, the electric industry should take this opportunity to step back and look at the big picture of how power system design flaws, regulatory lapses and market changes created the current environment where wide-area blackouts can strike quickly and easily.

Research into the 2003 incident revealed that a series of cascading events over the course of several hours, rather than a single instantaneous problem, initiated the major disturbance phenomenon that toppled multiple power grids. The blackout itself was preceded by line tripping caused by overgrown trees in the First Energy right-of-way accompanied by failures of EMS/SCADA alarm systems, which prevented operators from diagnosing problems. A lack of communication and coordination between First Energy and Midwest ISO (MISO), and MISO and PJM Interconnection also played a role.

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NERC Recommendations to Mitigate Cascading Blackouts

1. Correct the direct causes of the Aug. 14 event.
2. Strengthen the NERC compliance enforcement program.
3. Initiate control area and reliability coordinator audits.
4. Evaluate vegetation management procedures and results.
5. Establish a program to track implementation of recommendations
6. Improve operator and reliability coordinator training.
7. Evaluate reactive power and voltage control practices.
8. Improve system protection to slow or limit spread of cascading outages.
9. Clarify reliability coordinator and control area rules.
10. Establish guidelines for real-time operating tools.
11. Evaluate lessons learned during system restoration.
12. Install more time-synchronized recording devices.
13. Re-evaluate system design, planning and operating criteria.
14. Improve system modeling data and data exchange practices for inter-regional planning studies.

Operating these models takes time and money, but they can reveal the small system problems that can trigger a network disturbance. Moreover, NERC believes the 2003 blackout uncovered the fact that many models are inaccurate. The council is calling on utilities to validate the accuracy of their models and ensure that the input parameters are up to date. Official certification of both models and data by outside contractors could be mandated in the near future.

NERC has also announced plans to implement routine audits of control area and reliability coordinators. Proposals have been made to require training of certain key control room personnel to assist them in identifying and responding to a nascent problem more quickly before it spreads. Related to this concept is a recommendation to enhance alarm filtering and improve communication between neighboring control centers so that one grid is not blind-sided by a problem growing in the adjacent network.

Although NERC's auditing and analysis approach may be viewed as a piecemeal solution to preventing short-term problems, it dovetails with the next two steps that bring a broader and longer-term focus to the overall strategy of blackout prevention.

Corrective and Preventive Actions

Properly implemented auditing and analysis will identify a spectrum of preventive and corrective actions that individual utilities should undertake to begin fixing many of the network weaknesses that have become endemic due to years of non-existent or reactionary investment. These activities will include many, if not all, of the following:

Improve maintenance and assess condition of aging infrastructure – Numerous blackouts have been traced to lines sagging into trees in the right-of-way. Utilities must implement regular schedules to clear these areas of vegetation and other objects that can interfere with transmission or equipment access. Aging infrastructure must be serviced or replaced on a routine basis. Industry vendors have introduced equipment monitoring and diagnostic tools to identify components not performing within established parameters. Detailed modeling algorithms that can be applied to determine when a piece of equipment should be upgraded, replaced or merely repaired to extend its life have been developed. These models include complex financial analysis programs to prioritize maintenance investments based on impact upon the entire power system.

Study protection coordination – Protection designs must be reviewed regularly across regions as system conditions change. In areas particularly vulnerable to blackouts, designers must ensure that protection devices are both secure and dependable. For example, they must be designed to avoid tripping generators too early (e.g. avoid lack of coordination of volts/Hertz relays with voltage regulators and excitation limiters).

Implement special protection schemes – It is unfair to expect operators to act fast enough during sequence of outages, and it is very difficult for operator to decide to shed load, even if conditions are deteriorating. Implementation of wide-area special protection schemes can improve power system security and reliability. A wide-area special protection system detects abnormal network conditions and takes pre-planned corrective action to restore acceptable performance. For example, it is quite possible that disturbance propagation during August 14th events could be prevented by implementing under-voltage load shedding schemes. Wide-area special protection schemes should be based on preplanned, automatic corrective actions established as a result of system performance studies.

Implement adaptive protection – Adaptive protection offers multiple setting groups that adjust automatically to changes in the system. Microprocessor relays now support the use of adaptive protection schemes to provide better response of the system under stressed conditions. Test protection applications and relays – Not only individual relays, but protection applications should be tested to prevent malfunctions and identify design flows. Special protection schemes must be tested along with those in neighboring areas to ensure coordinated performance.

Study voltage and transient stability with appropriate tools and models – Comprehensive studies of these and other system disturbance conditions should occur regularly, especially to detect problems that evolve over time. Models are available but they should be certified as the right ones for the job. For example, voltage stability should be studied using time domain simulation tools rather than steady-state programs.

Improve monitoring, diagnostics and control center performance – Telecommunications and data handling capabilities make it possible to improve SCADA and EMS functionality so that they can filter, display and analyze only critical information. And the availability of these critical functionalities must be boosted to 99.99 percent. Alarms must also be enhanced to feed only the crucial failures to operators. In

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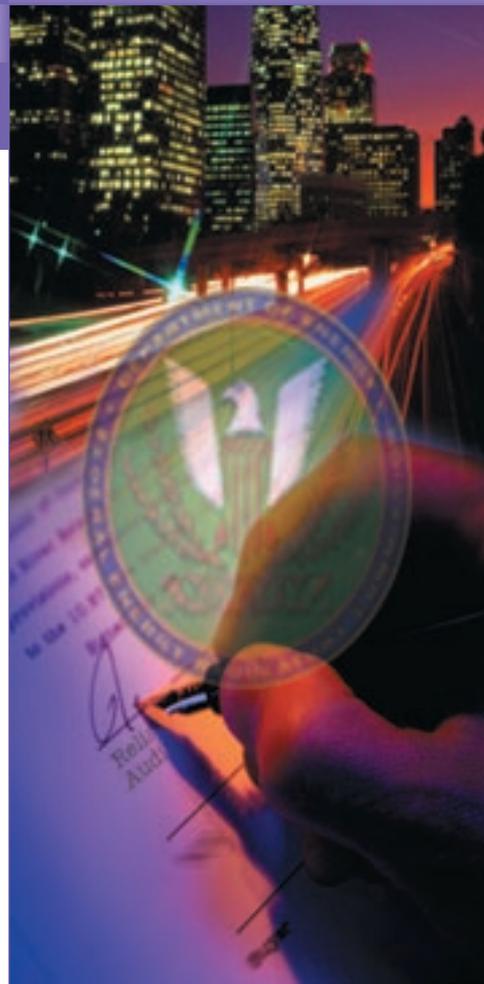
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addition, faster and more accurate state estimators must be developed using modern fast transducers to provide time-synchronized measurements from across the grid.

Include advanced algorithms and calculation programs in SCADA – Faster-than-real-time simulations could assist the operator in calculating power transfer margins based on a variety of contingencies.

Require certification training – Control center operators must undergo more rigorous and routine training that includes coordinated simulations involving multiple centers in interconnected systems.

Introduce cyber security to control systems – In the absence of regulatory pressure or a major utility network incursion by a worm, virus or perpetrator, the cyber security of control systems must be strengthened. This means that security must be built into the development of new control system. Tighter security policies pertaining to control room personnel must also be enacted.

Establish real-time operating limits on a daily basis – More exact line overloading limits must be determined by using monitoring and protection equipment based on dynamic line ratings. These should be calculated depending on ambient temperatures, wind, pre-contingency loading and other factors.

Long-Term Policy Changes and Investments

Fallout from the 2003 blackout has renewed calls for tighter regulatory policies and controls, which will have potentially long-term impacts on the industry when enacted. The first order of business is for state and federal regulators to resolve lingering uncertainties over accountability and jurisdiction. For example, a compromise must be reached regarding eminent authority over the siting of transmission lines and FERC jurisdiction over publicly owned transmission. Currently, ISOs are accountable for reliability and security, while transmission asset owners maintain the physical system.

Regulatory actions must be aimed toward ensuring compliance of existing standards and coordinating blackout prevention and response among control areas. These policy activities should also enable efficient system planning, permitting and market operations. Conservation should be encouraged wherever appropriate, and policies should facilitate establishing new sources of generation closer to the loads.

Complementing these regulatory and policy changes must be focused investment on the part of energy utilities. The following investments will improve overall system performance long into the future and minimize blackout factors in the process:

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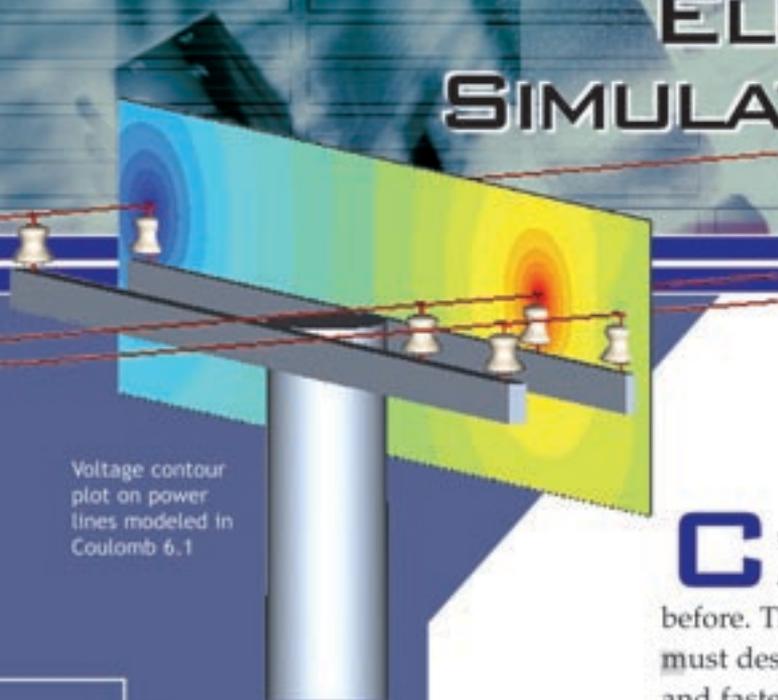


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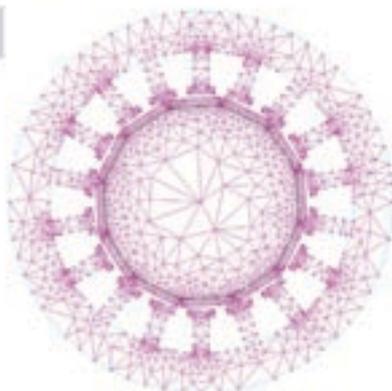
Voltage contour plot on power lines modeled in Coulomb 6.1

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Voltage contour on an insulator with a corona ring modeled in Coulomb 6.1



Hybrid mesh of an electric motor created in Magneto 6.1.

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Strengthen the power network – The transmission grid must be expanded and upgraded to handle increased power flows. This can be accomplished by installing extra transmission lines and cables and properly applying distributed generation for situations when remote resources are rendered ineffective by system conditions. Reactive power requirements must also be satisfied by implementing additional shunt capacitor banks and SVCs. Finally, the planned installation of reactive resources in distribution networks can perform conservation voltage reduction, which can shed soft loads in emergencies.

Improve transmission power flow control – Utilities should install high-voltage power electronics devices, FACTS and HVDC links to allow for faster and more precise switching. This will enhance overall system control and increase the level of power transfer that can be accommodated by the existing grid.

Design more robust power systems – Perhaps led by government research, utilities should examine new energy storage and power delivery technologies, including superconductivity and micro-grids, to build power systems that are less susceptible to blackouts.

Implement wide-area monitoring, control and protection – The ability of computer relays to communicate remotely with the control center and each other to monitor quickly developing disturbances can change the philosophy of system-wide protection and control. Adaptive system-wide protection schemes are improvements on event- or alarm- based special protection schemes. The input data to the decision-making logic is taken from the continuously monitored data, stored in the database. A low speed communication interface for SCADA communication and operator interface should also be available as an enhancement for the SCADA state estimator. Actions ordered from SCADA/EMS functions, such as optimal

power flow, emergency load control, etc., could be activated via the system protection terminal. The power system operator should also have access to the terminal, for supervision, maintenance, update, parameter setting, change of setting groups, disturbance recorder data collection, etc.

System protection terminals can utilize GPS-stamped synchronized phasor measurements for protection applications and contain decision-making logic to derive appropriate output control signals, such as circuit-breaker trips, AVR boosting and tap-changer action. Groups of these terminals can be integrated into local protection centers and system protection centers (SPC) can coordinate several local protection centers to achieve a multi-layered protection system that prevents disturbance cascading.

No Silver Bullet

Each of the above-described prevention techniques, both short- and long-term, plays an incremental role in diminishing the current environment that fosters and propagates disturbance events. When cost, performance and risk are balanced properly, these steps can have a dramatic cumulative impact on reducing the likelihood of blackouts.

Third-party vendors have developed software tools that can assist utilities in balancing these objectives and devising a comprehensive set of priorities to guide the investment strategies. Independent audit programs can also assist utilities in determining where their greatest vulnerabilities reside, which further helps power companies decide where their investment dollars are best spent.

However, for every unlikely outage contingency that is protected against, there will be others, even less probable and possibly more devastating. Blackouts will occur, which means the energy industry must put as much effort into preparing for them as preventing them. Therefore, interconnected grid operators must develop coordinated restoration procedures to bring networks back on line as soon as possible.

Reliable and efficient restoration software within the EMS/SCADA system can assist operators in executing optimal procedures quickly. And regular staff training and simulation enable personnel to take appropriate steps immediately following a disruption. Although automated power restoration technology has not been widely deployed, recent advancements in communications and measurement techniques make this a more viable option. This solution is worth considering so that loads can be shed automatically to avoid exacerbating the event, thus returning power to customers more quickly. ■

About the Author

Damir Novosel is the President and General Manager of T&D Consulting at KEMA, with North American headquarters in Burlington, Mass. He may be reached at DNovosel@kema.com

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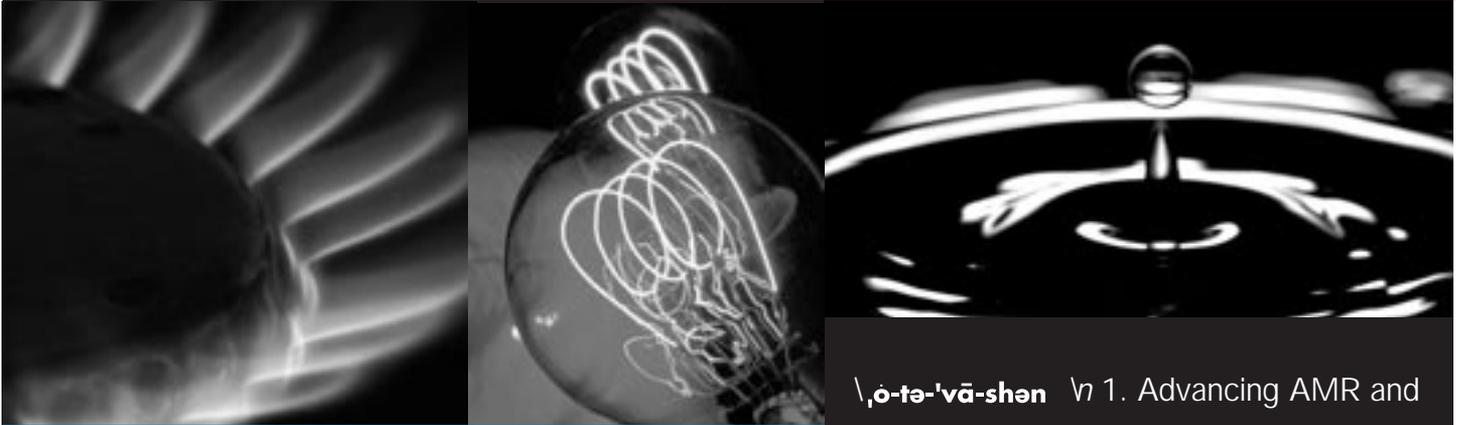
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Workflow Automation:

Experience an Immediate Return on Investment

By: Janine King, National Accounts Manager, Document Imaging Solutions, Inc.

The ever-evolving North American corporate culture is demanding organizations become more efficient through time savings, monetary savings, decreasing future hiring requirements, and recognizing an immediate return on investment in order to justifying capital expenditures. Customers are influencing organizations by expecting goods and services “yesterday”. Higher expectations, combined with the need for complete activity audit trails, are forcing organizations to explore new technologies that will allow them to become more competitive, while complying with industry regulations. One such technology capable of meeting these requirements is Workflow Automation (Business Process Automation).

Workflow Automation is defined as the definition, facilitation, and tracking of the flow of work between individuals, entity functions, or groups of users and/or departments. It is often used to greatly enhance an organization’s ability to perform work in a timely and more efficient manner.

Workflow Automation can be used to automate ANY business process and can be tied into your existing databases and business systems. Not only is workflow automation used for routing documents, but it is also used to consolidate data from many distributed databases into one application interface for routing data-based information for approval, collaboration, reconciliation, or modification. Many Electronic Document Management/Content Management solutions include a workflow component for handling document based workflow processing. Workflow Automation solutions go beyond document centric workflow, integrating with your existing business systems and databases to provide automation of any process within the organization.

Workflow Automation is a very powerful tool when properly implemented. Most users do not know their exact “process” until they truly analyze how they currently do business. It has been the experience of Document Imaging Solutions, Inc., that users generally do understand their business

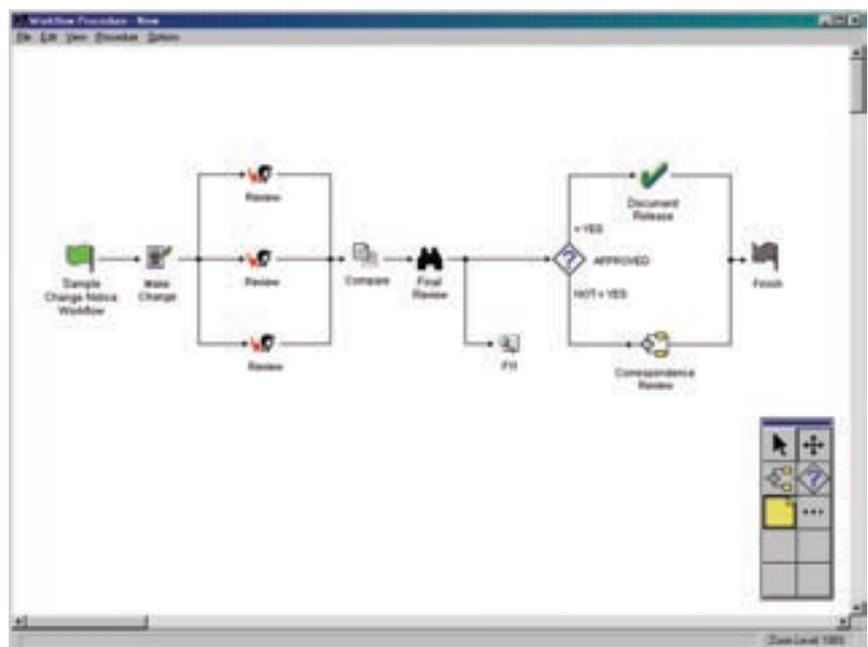
processes, however, it is not until they actually sit down with other users to discuss how the process should be automated, that they realize there are many steps that can be consolidated or eliminated.

The path of the workflow process is not the only critical piece to implementation. Each step of the process must be analyzed to determine what information needs to be gathered prior to moving to the next step of the workflow process. Is data entry needed? Is the user an approver? Can the user reject the process? Can the user send data or documents back for additional information? Are annotations needed at this step? By answering these questions, organizations are able to begin to reengineer their business process to improve their current manual process. This is the first step to workflow automation, designing the process. It is very important to have users from all steps within the process participate in the design stage. Workflow Automation, although not difficult to implement, is a culture change. In order to ensure a successful implementation, all users should be involved during the design stage and exercise “buy-in” at every step of the project.

After the initial design is complete, the workflow process is programmatically created to fulfill the requirements set forth during design. The workflow process is then ready for implementation and user acceptance.

While it is very important to spend a great deal of effort on designing the workflow process, it is also very important to realize that until implementation, the organization will never truly “understand” the process. Steps will be eliminated, consolidated, or added based on ongoing requirements. This is the reengineering or streamlining stage. During this stage, you begin to realize the Return on Investment of implementing workflow automation.

Working along side our clients, Document Imaging Solutions, Inc. has helped shorten R&D processes from 125 days to 34 days, engineering change control processes from 110 days to 5 days, and purchase order processes from 30 days to 7 days by solely implementing workflow automation. Workflow automation eliminates bottlenecks to increase efficiency, compress cycle times, improve customer service, reduce future hiring requirements, improve the bottom line, and see an immediate Return on Investment.



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Workflow Automation can be used to streamline ANY business process. Service Order Handling, Purchase Order Approval, Engineering Change Order processing, New Hire approval, Contract Approval, and Accounts Payables Reconciliation are just a few examples of manual processes that can be created electronically using workflow automation. Organizations of all sizes and types can benefit from this technology.

Following the corporate scandals that rocked the economy and changed the way the government mandates record keeping and reporting, organizations are looking for tools that aid in regulatory compliance. Workflow Automation is one of these tools. Complete audit trails are maintained for every step within a process. Organizations use this auditing information to create detailed reports about who, what, when, why, and how documents and data based information were created, modified, approved, rejected or destroyed.

Organizations must be careful when evaluating software that is said to include "workflow" capabilities. Users can sometimes be misled as there are many vendors that claim to have workflow as part of their applications. The truth is, virtually any software package that can route a document from one user to another is categorized

as a workflow application. However, "Workflow Automation" goes much farther than routing documents from one individual to another. Workflow Automation allows for specific rules to be set up to mimic your exact business process. With Workflow Automation, users can route documents to individuals, groups, or entity functions. Each step within a workflow automation process can be predefined or ad-hoc. Decision variables can be used to route documents along different paths within your business process. Workflow Automation can perform "back-end" processing, calculations, or automated routing of distributed document and data based information. Graphical workflow status can be displayed by the users to determine where in the process the workflow currently stands. Complete audit information regarding users, time limits, completion time, etc. are available for reporting in order to identify bottlenecks in the process. There may also be parent-child relationships between workflow automation processes. If an application with "workflow" capability does not have all of the functionality listed above, the organization will not be able to streamline business processes, compress cycle times, eliminate bottlenecks, become more efficient, or see an immediate return on investment.

There are a few software packages that can be used to create electronic workflow automation processes that mimic the current paper process. One such application is e-DMS-Workflow™ by Document Imaging Solutions, Inc. The electronic workflow automation capability within e-DMS-Workflow™ is used for automating any mission-critical business process. The electronic workflow will permit documents/document packets/folders/attachments, and the like, to be electronically routed to the appropriate person(s) for review and/or approval. Workflows can be pre-defined and/or ad-hoc, and be comprised of serial, and/or concurrent processes, and FYI (non-decision) steps. Each step of a workflow can be defined as a specific individual, pre-defined group, or pre-defined corporate entity function, and each step can have a pre-defined or user-defined time limit for action. Upon expiration of the allotted time at any step, certain actions may be initiated by the application such as notifying specific user(s) and/or automatically re-directing the flow, etc. An audit trail of each workflow will be archived as accessible data maintained in the database. The audit information may contain any data associated with each step of the workflow, such as individual/group/entity function, date, times (when worked and when forwarded), functions performed, approval designation, rejection, etc.

More and more, Workflow Automation is used by organizations to meet the demands of governmental agencies enforcing compliance with recent regulations dealing with disaster recovery and the handling of financial, organizational, medical, administrative, legal, and personal document and data-based information. Implemented properly, Workflow Automation provides a rapid Return on Investment (ROI), while providing the tools necessary to improve efficiency and meet regulatory guidelines. ■



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Photo by Mieke Mahi

2004 Key Women in Energy-Americas recipients were recognized at a special 'Chocolate Reception' at the Houston Museum of Natural Science. Honorees and executive committee members(*). (Front row, L-R): Jane Kyle Edgar, Schlumberger Ltd.; Kathleen Clarke; U.S. Department of Interior – Bureau of Land Management; Megan Gibbs, ABB; Jill Prince, Hitachi Consulting; Kim Clark, Entergy-Koch Trading; Cynthia Kase, Kase and Company; Leslie Haines, 'Oil and Gas Investor' magazine; Dr. Lisa Shevenell, Great Basin Center for Geothermal Energy and Nevada Bureau of Mines & Geology; Claritza Zavarce, BP Venezuela; Johnnie Burton, U.S. Department of Interior – Minerals Management Service; Paula McCann Harris, Schlumberger Excellence in Educational Development; Helen Burroughs, U.S. Department of Commerce – Office of Energy; Karyl McCurdy Lawson*, Attorney-at-Law and Energy Consultant; Pia-Angela Francini, Schlumberger Ltd.; Holly Koepfel, AEP; Alicia Warlick*, Jones School of Management, Rice University; and Kandy Lukats, Upstream Technology Consultants and Time Finders.

(back row, L-R): Deborah Fiorito*, 20-K Group; Maria Lizardo (presenter; 2003 honoree); Alison Dancey, Memorial University of Newfoundland; Georgia Baxter, J.H. Baxter & Company; Diane Webb, Hitachi Consulting*; Lois Hedgepeth, Centrica North America; Catherine Hughes, Schlumberger Canada; Sherry MacDonald, EPCOR Utilities; Deborah Resley, DR & Associates; Linda K. Rader, Rader Energy (founder/chair, Key Women in Energy); and Elisabeth Eljuri, Macleod Dixon.

Attending, but missing from photo: Presenter Marcy Grossman, Canadian Consulate General; Carlos Garibaldi*, The Scotia Group; Amy Myers Jaffe, James A. Baker III Institute for Public Policy; Jackie Lafontaine, Shell International Exploration and Production; Gerrit Maureau*, University of Newfoundland; Evangelia (Lea) Souliotis, Enchange; and Maryanne Tidwell, Canadian Consulate-Houston (sponsor).

Key Women In Energy-Americas 2004 Awards

By Linda K. Rader

"Persistence is the key to achieving any goal," said Catherine Hughes, president of Schlumberger Canada, Ltd. Hughes was recognized in the 'Wisdom' category in Rader Energy's 2nd annual Key Women in Energy-Americas awards for 2004.

She was one of 100 women who live and/or work in the western hemisphere (or who lived/worked there some time during 2001-2004) who were honored in Houston, Texas, on May 4 for excellence in their individual contributions to the energy sector or to the supporting services and programs that support the energy sector. The award is designed to recognize those individuals making a difference to their company, country or to the entire industry as a whole.

Awards were given in six categories representing personal characteristics: Leadership, Wisdom, Visionary, Pathfinders/Trailblazers, Innovation/Creativity and Potential. Honorees were selected from among approximately 360 nominations by a distinguished panel of judges that included energy insiders, dignitaries and past honorees from Newfoundland to Uruguay (see list).

Honorees include many of the top-ranked executives in Canada, the United States and South America. Nominations are now available in six languages – English, French, Spanish, German, Dutch and Arabic.

The result has been the presentation of exceptional talents that might not, in the past, have been formally recognized by corporations, organizations or entities that were proud of associates yet a bit wary of individual attention. One somewhat surprising result of these awards has been a subtle expressed interest by talented individuals looking to make career movements toward companies with past honorees. Corporate excellence shines through its most valued assets – employees.

Six women were recognized as 'winners' of their respective categories: Kristine A. Burnell, Vice President of Operational Excellence Mid East Region, Kellogg Brown & Root (KBR), stationed in Kuwait ('Pathfinders/Trailblazers'); Holly Koepfel, Executive Vice President – Utilities East (until June 2004, Executive Vice President – Commercial Operations), American Electric Power (AEP), of Ohio ('Leadership'); Alicia Izarraraz, Works General Manager, BP Amoco Chemical Company-Chocolate Bayou Works, in Alvin, Texas ('Wisdom'); Vicki Colvin,



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Executive Director, Rice University Carbon Nanotechnology Laboratory, and Professor, Chemistry and Chemical Engineering, in Houston ('Innovation/Creativity'); Pia-Angela Francini, Business Development Manager-Well Production Services, Schlumberger Ltd., in Houston ('Visionary'); and Megan C. Gibbs, OEM Marketing Representative, ABB, in Florida ('Potential'). Burnell, Koepfel, Colvin and Izarraraz were each also recognized in March as honorees in the 2004 Key Women in Energy-Global awards.

The Key Women in Energy-Americas program is presented by Houston-based Rader Energy. Silver Sponsors include the Canadian Consulate-Houston, Bozell & Jacobs, Sullivan & Worcester and the 20-K Group. Bronze Sponsors include Raleigh-based ABB, GE, Kase & Company, Progress Energy, Walden Energy and YES, Inc.

The formal media host is Lachenaie-Quebec-based ElectricEnergyOnline.com electronic magazine. Supporting media includes Latin America Energy Report, published by WorldTrade Executive in association with Dow Jones. Related articles appear in 'Diversity/Careers in Engineering and Information Technology', 'ElectricEnergyOnline.com', the 'Calgary Herald', 'Alberta Ventures' magazine and on multiple corporate Web sites and publications.

Supporting organizations include ARPEL-Asociación Regional de Empresas de Petróleo y Gas Natural en Latinoamérica y el Caribe (Regional Association of Oil and Natural Gas Companies in Latin America and the Caribbean), the Bilateral US-Arab Chamber of Commerce, the Canadian Energy Research Institute (CERI), the Comité Femmes de L'Ordre des Ingénieurs du Québec (Women's Committee of the Order of Engineers of Quebec), Edison Electric Institute (EEI), the Energy Forum, the Green Trading Summit 2004, ILNGA (International LNG Association), Lukoil Overseas Ltd., the National Energy Marketers Association, the North American T&D Conference & Exhibition, and Ottawa-based Nation Media, which arranged the 2004 awards through and in cooperation with its Canadian First Nations, Metis and/or Inuit suppliers.

Carolyn Ritchie, Offshore Technology Conference (OTC) 2004 Program Vice-Chair arranged for a panel of executives, including many 2003 and 2004 Key Women in Energy-Americas honorees, to present 'Key Women in Energy: Technology and Policy' at OTC's 2004 conference held in Houston the same week. The creative honors ceremony, a 'Chocolate Reception', attracted 125 diplomats, executives and honorees. It was held in conjunction with 'Chocolate: The Exhibition' a Houston Museum of Natural Science exhibit highlighting Mayan culture. Presenting awards with Linda Rader were Marcy Grossman, Consul and Senior Commissioner of the Canadian Consulate General and Venezuela-based Maria Lizardo, a 2003 'Americas' and 2002 global honoree.

Nearly half the 2004 'Americas' honorees were admitted in the 'Leadership' category from nearly 200 nominations submitted for consideration for that category alone. So many women were proposed for their outstanding leadership skills, in fact, that the category will be split for 2005 into 'Leadership' and 'Teamwork', the latter to identify excellence in those who both lead and manage an entire cohesive team that works effectively in unison.

Contrary to some long-standing myths, there are now so many outstanding female energy leaders and executives that a new rule was implemented for future years, commencing with 2005 -women recognized for two consecutive years will be ineligible to stand for consideration the following year. This rotation will provide the opportunity to recognize specific accomplishments and acknowledge the depth and breadth of talent across the western hemisphere. There was a six-fold increase in South American honorees from 2003 and a nearly 30 percent increase in Canadian honorees.

As an individual honors program instead of a corporate recognition, no limit was placed on the selection committee for the number of employees admitted from a single company. Therefore, several companies had multiple employees recognized in 2004: Schlumberger (6), Shell (5), BP (4), GE Energy (4), the United States government (6), ABB (3) and ConocoPhillips (3). Two employees each were recognized from US-based firms American Electric Power (AEP), Calpine Corporation, and the combination of Halliburton and Kellogg Brown & Root, and from BC Hydro & Power Authority in Vancouver, Canada, and Macleod Dixon in Caracas, Venezuela.

There is an increasing acknowledgement of the international flavor of energy among this multi-national, multi-lingual and well educated group. There is a noticeable movement and placement of executives in both the natural transition of leadership and recognition of outstanding performances. For example, prior to her current assignment in Kuwait, Kristine Burnell ('Pathfinders/Trailblazers') spent six months living in the Presidential Palace in Baghdad. Paula McCann Harris ('Wisdom') of Schlumberger worked on every continent except Antarctica. Elizabeth Sue 'Susie' Crawford ('Pathfinders/Trailblazers') of Fluor Corp. is based in Houston, yet lives and works out of Tengiz, Kazakhstan. Xenia Baumgarten, General Manager, Lukoil Overseas Colombia Ltd., in Bogotá, opened Colombia and South America for Russian oil giant Lukoil.

On the personal side, as they balance business and personal lives, a growing number of husbands manage household for this year's honorees. Several honorees have been blessed with children this year. Lisa Bodensteiner, ('Wisdom'), Executive Vice President and General Counsel, had her eighth child in 2004.

ABOUT THE AUTHOR:

Linda K. Rader is President of Houston-based Rader Energy. She is a 25-year energy veteran specializing in business development, corporate strategy and natural gas or gas-to-power supply and pipeline transportation contract negotiations. She founded and chairs the Key Women in Energy programs (Global, America and new for 2004, Europe) Key IT Players in Energy and Energy Leaders awards programs.

PATHFINDERS/TRAILBLAZERS

Exceptional contributions by some of the following pioneers blazed trails for others to follow. Their collective experiences for either single-time experiences or lifetime achievement make this the 'hall of fame' for the Key Women in Energy awards program.

Category 'Winner': Pathfinders/Trailblazers



Kristine A. Burnell, Vice President of Operational Excellence, Mid East Region, Kellogg Brown & Root Inc., a Halliburton Company, Kuwait City, Kuwait, www.halliburton.com
(Worked 2003: Iraq;

Country of Birth: USA)

An American citizen, Kristine Anne Burnell is both trailblazer and role model. She has spent much of her career working abroad for Halliburton. Her operational roles have spanned the globe—from Haiti to Hungary, Albania, Bosnia, Kosovo, Macedonia, the United States of America, Kuwait and Iraq.

Burnell is an experienced emergency responder. Her most recent resounding success was as KBR's Executive Project Manager assigned to provide critical Life Support to the Coalition Provision Authority (CPA) in the support of the Iraqi infrastructure rebuild and the reconstruction of the Iraqi Oilfields. In this role, she relied upon her knowledge of all aspects of energy efficiencies, Health, Safety and Environmental, Quality and Security organizations. The mission in Iraq included establishment of power and utility infrastructure upgrades necessary for sustaining the CPA population along with establishment of temporary living facilities and all associated life support services. She oversaw 18 similar sites throughout Iraq and Kuwait.

Burnell continues her work in the Mid-East Region from Kuwait after spending six months in Iraq working from the Presidential Palace in Baghdad. She is currently leading a team to enhance operational excellence across the KBR Government Operations Unit in support of their LOGCAP III and Reconstruct Iraqi Oil (RIO) programs.

Pathfinder/Trailblazer Honorees:



Georgia Baxter, President & Chief Executive Officer (CEO), J.H. Baxter, San Mateo, California, USA, www.jhbaxter.com

As head of J.H. Baxter, a large US manufacturer and supplier of preservative-treated wood utility poles, Georgia Baxter is facilitating change in energy support. Under her stewardship, J.H. Baxter has taken a leadership position in searching out and providing customers more environmentally friendly wood preservation preservatives. Still in its infancy, the company established an innovative approach it believes will be adapted by the industry, and will strongly impact the way electric energy is carried point-to-point.



Ellen Berman, President, Consumer Energy Council of America, Washington, D.C., USA, www.cecarf.org

Ellen Berman is a consensus builder among diverse interests on energy and telecommunications issues and producing policy recommendations to advance public interest. Berman pioneered a process for developing a public policy on contentious, high-stakes issues through consensus of the major stakeholders in the public and private sectors. CECA is launching a public policy form bringing together 50 distinguished energy leaders to provide guidance to policymakers on ways to upgrade the transmission system to meet consumer needs.



Cynthia Breitzkreuz, General Manager of Installation Services, GE Energy, Atlanta, Georgia, USA, www.gepower.com

Responsible for installation and commissioning of more than 300 turbine generators worldwide, Cynthia Breitzkreuz oversees a business that generated approximately \$470 million in 2003. Her team of more than 350 people was instrumental in the startup of GE's newest technology turbine, the 9H, in Baglan Bay, Wales. They support the expanding energy market infrastructure in China, are active in the 'mini-bubble' of installation activity in Europe, and will be supporting rebuilding efforts in Iraq.



Helen Burroughs, US Department of Commerce (DOC), Office of Energy, Washington, D.C., USA, www.doe.gov

Helen Burroughs is known for her work with small businesses. Within the DOC, she is responsible, worldwide, for all energy sectors—electric power, oil and gas, nuclear, coal, and renewable and alternative energy. She created the Commercial Cooperation Working Group of the United States-China Forum on Environment and Development - the only forum working group with private sector participation. She created the idea of a private sector forum for the oil and gas industry, then jointly developed and implemented the U.S.-China Oil and Gas Forum with the Department of Energy (5th forum is summer 2004). She developed the Electric Power Working Group for the Department of Commerce initiative, the U.S.-China Joint Commission on Commerce and Trade.



Elizabeth Sue 'Susie' Crawford, Field Engineering Manager, TengizChevrOil (TCO) Asset Development Project, Tengiz, Kazakhstan, and Principal Project Engineer, Fluor Corp., Houston, Texas, USA, (Country of Birth: USA), www.fluor.com

Crawford feels fortunate to have participated in multiple large, global development projects. Since 2001, as engineering manager in Kazakhstan for both the Caspian Pipeline Consortium (CPC) and TCO projects, her team resolved construction issues. She shares experiences learned through her management roles by mentoring nationals while on assignment. She considers it rewarding working side-by-side with people she views as future leaders and helping them develop their own leadership skills.



Amy Myers Jaffe, Wallace Wilson Fellow for Energy Studies & Associate Director, Rice Energy Program, James A. Baker III Institute for Public Policy, Rice University, Houston, Texas, USA, www.bakerinstitute.com

Amy Jaffe has earned a national reputation as an expert in energy policy. Jaffe is credited for the Baker Institute Energy Forum's success and its emergence as a major center for study of strategic energy issues. She coordinates work of the Energy Forum with other campus entities, including the Shell Center for Sustainability, Environmental & Energy Systems Institute, and Center for Nanotechnology Science and Technology. She has cultivated mutually beneficial relations with major Houston corporations.



Marilda Rosado de Sá Ribeiro, Private Consultant/Lawyer, Rio de Janeiro, Brazil, mrosado@iis.com.br

Marilda Rosado de Sá Ribeiro is a petroleum law specialist and strong advocate in Brazil. Her experience covers international E&P contracts: joint-operating agreements (JOAs), bids for services and materials, analysis and negotiation of performance bonds and standby letters of credit, arbitrage and shareholders agreements. She is a member of the Legal Committee at the IBP and an Association of International Petroleum Negotiators (AIPN) representative in Brazil. Author of two books, her "Petroleum Law" (2003) reflects themes permeating oil company activities operating under JOAs in Brazil compared to domestic and international market models.



Dr. Lisa A. Shevenell, Associate Director, Great Basin Center for Geothermal Energy, and Research Scientist at the Nevada Bureau of Mines & Geology, Reno, Nevada, USA, www.nbm.unr.edu

Dr. Lisa Shevenell's research program, funded by several grants from the Department of Energy and other sources, has greatly advanced the understanding of hydrogeological processes in Great Basin geothermal systems (Western U.S.). Her research team at the Great Basin Center for Geothermal Energy has significantly refined definition of geothermal systems that can be developed for electrical power generation and direct use applications. Cutting-edge research led by Shevenell is contributing greatly to the understanding of these systems.



Gail Watkins, Partner, Akin Gump Strauss Hauer and Feld LLP, Austin, Texas, USA, www.akingump.com

Gail Watkins has played legal and policy aspects roles of multiple energy events in the United States and Mexico. In 1998-1999, she headed cross-border natural gas pipeline negotiations that provided Pemex Gas y Petroquimica Basica access to Houston's major gas market hubs. Watkins currently plays a lead role in coordinating litigation and regulatory matters on behalf of FirstEnergy Corp. in connection with governmental investigations and private lawsuits related to the historic August 2003 Northeast blackout.

VISIONARY

It is a rare talent to predict the future, spot trends before they materialize and direct/redirect entire companies down the road to productivity and profitability. These visionaries navigate through or around road blocks that would stop others in their tracks.

Category Winner: Visionary



Pia-Angela Francini, Business Development Manger – Well Production Services, Schlumberger Ltd., Sugar Land, Texas, USA,

www.schlumberger.com

(Country of Birth: Australia)

One element of Pia-Angela Francini's success has been her fervent belief in the power and creativity of the team. People want to follow her leadership. "I was brought up in Australia in a multi-cultural environment," said Francini. "I was brought up believing there are no limits. One can achieve what they set their mind to. If you can unlock the energy from within the company and within the team, it creates a powerful combination where every member of the team definitely makes a results difference. Everyone on that team then has the opportunity to both make a difference and to reap the rewards."

Much of what she does for a living is directly involved with vision and establishing the strategic direction for multiple domains – IT enterprise architecture, setting strategy for R&D strategic direction, and technology in the domain of well production services – proppant and acid fracturing, matrix stimulation, sand control, water and scale control (all in the production realm). In 2004, she is in the thick of Schlumberger's hand-picked global corporate 'Vision and Strategic Planning Team'. She was on the 2003 gold medal-winning team of the prestigious 'Performed By Schlumberger' award, with a technology for unlocking reserves and increasing production. She has had 2 patent filings in well production enhancement technology.

Visionary Category Honorees:



Xenia Baumgarten, General Manager, Lukoil Overseas Colombia Ltd., Bogotá, Colombia, www.lukoil-overseas.com.co (Country of Birth: Argentina, of Russian origin). Related honors: 2004 Key Women in Energy-Global awards - 'Visionary' category 'winner'

Due to Xenia Baumgarten's actions, Russian oil giant LUKOIL started operations in South America. Of significance, Lukoil Overseas was the first Russian company to sign an exploration contract in Colombia in particular, and in South America in general. Baumgarten recently successfully negotiated an exploration contract with Ecopetrol (Colombia's national oil company). Signed April 8, 2002, it was for one of Colombia's most prospective exploration blocks. This project allows LUKOIL to set foot in a new strategically important region.



Jane Kyle Edgar, North & South America



–Environmental Manager Oilfield Services,

Schlumberger Oilfield Services, Sugar Land, Texas, USA, www.schlumberger.com (Countries of Work 2001-2004: USA and Siberia, Russia; Country of Birth (Dual Citizenship): Born in Brazil to Irish Parents)

These past few years, Jane Edgar worked globally, including Siberia. She created Schlumberger's environmental strategy and deployment in close cooperation with its global environmental team. Of importance to her are secure compliance and programs to reach the requirements of the company's environmental policy and recognizing environmental efforts made by company employees, and their families, in their locations and communities. She introduced the Environmental Excellence Program - an award recognizing, promoting and encouraging environmental initiatives ranging from designed closed loop water systems to teaching children how to recycle and sell material to support school supplies.



Sandra S. Haskins, Lead Fuel Procurement and Emissions Trading Fossil Fuels, Progress

Energy, Raleigh, North Carolina, USA,

www.progress-energy.com

In 2003, Sandra Haskins led the design and development of a 10-year comprehensive fossil fuels strategy for coal-fired power plants. Haskins' diverse energy market career (power, gas and coal) will be instrumental in driving implementation of Progress Energy's sweeping emissions-reduction plan. Haskins and team commenced immediate first-stage initiative utility implementation in (month/year).



Randi Neilson, Vice President – Marketing, Itron, Spokane, Washington, USA,

www.itron.com

When Itron decided in 1999 to change the face and direction of the company, one of the principal architects and purveyors of Itron's vision was Randi Neilson. In three short years, she played a critical role in guiding Itron from what was once considered a single-offering, meter data collection company, to a full-service, global corporation offering unparalleled solutions and strategic partnerships with the utility industry. Neilson reached out to industry and turned science fiction into something very real.



Margarida Ramos, Director of Community Relations, Organizações Globo de Brasil, Brazil

Margarida Ramos is a powerful woman in Brazil. Organizações Globo is the major holding of communications means in Brazil, including radio stations, several newspapers, an editorial, a record house, and Globo Cabo, the major TV operator by subscription and of services of wide band. Sales are US\$5.700 million per year, including the most important TV channel in Latin American, TV Globo, considered one of the five most important in the world.



Carolyn Shockley, General Manager, Products & Services, Network Reliability Services, GE

Energy, Atlanta, Georgia, USA, www.gepower.com

Carolyn Shockley thrives on change. In her previous position as GE Energy's General Manager of Substation Automation Solutions, she was responsible for seamlessly integrating five acquisitions into one business unit, and setting strategic direction of the business after the acquisitions. In fewer than two years in her current role, she is working to help merge that one business unit with another to create a new entity twice the size of the original with an even broader focus.



Chantal Sorel, Senior Projects Manager, ABB Inc., St. Laurent, Québec, Canada, www.abb.com

Chantal Sorel is an Architect (1988) with a strong construction management background. In 2002, she was one of only two Canadians chosen to attend the International Management Program in the ABB Academy in Zurich. As a member of the Project Management Institute, she served the Board of Directors of the Montreal Chapter as its President since January 2002. She has developed the 2003-2005 Strategic Plan addressing needs of the business community, the government and traditional participating members, including Hydro-Quebec.

INNOVATION/CREATIVITY

This group highlights exceptional talents and diverse contributions that "make the rubber meet the road," noted Mary G. Flieller, spokesperson for ABB, a 2004 project sponsor.

Category Winner: Innovation/Creativity



Vicki Colvin, Ph.D., Director, Center for

Biological and Environmental Nanotechnology (CBEN), and Professor of Chemistry and Chemical Engineering, Rice

University, Houston, Texas, USA, www.rice.edu

In 1996, Dr. Colvin was recruited by Rice University to expand its nanotechnology program. Research underway at the center focuses on nanomaterials' behavior in the environment and the body, and considers risk assessment and safety factors. As a physical chemist interested in complex materials problems, her group includes a diverse range of synthetic chemists, physical chemists and applied physicists. Specific research areas include template chemistry, meso- and macroporous solids, nanocrystalline oxides, photonic band gap materials and confided glasses.

Dr. Colvin's work in nanotechnology is on the edge of the frontier of breaking down barriers toward low-cost power for world citizens. Her work is extremely technical in nature, dealing with nano-sized particles of matter and the interweaving of carbon filaments into power and telecommunications infrastructure. Advances in this area of interest could affect future energy exploration and production, transmission of power or data, out space applications, and for everything down to the food that is consumed and the way medicine is uniquely designed for different individuals.

Innovation/Creativity Category Honorees:



Christina Andersen, General Manager of Gas Turbine Service Engineering, GE Energy, Greenville, South Carolina, USA,

www.gepower.com

Christina Andersen leads the team with total engineering responsibility, and provides technology solutions, for gas turbines. Her responsibilities include "cradle to grave" responsibility for the value package business for gas turbines. Since she assumed the position in 2001, sales have doubled to \$685 million from \$300 million. Andersen's innovation and creative resourcefulness are crucial since she manages a group that deals with, and finds appropriate technical solutions for, everything from 1950's-manufactured gas turbines to those manufactured today.



Michelle Billig, International Affairs Fellow,

Council on Foreign Relations, New York, New York, USA, www.cfr.org

Michelle Billig contributes to both development and implementation of United States international energy policy and helps respond to energy crises around the world. She has planned/executed diplomatic missions to China, Mexico, Brazil, Bolivia, U.K., Japan, South Africa, Morocco, Mozambique & Cameroon. Billig created financing mechanisms for clean energy projects at the Interamerican Development Bank and the Overseas Private Investment Corporation. Previously, as Director DOE programs in China, she was the first U.S. Department of Energy Representative posted in China.



Maria Fee, Director of Strategic Initiatives, Kitba/SPX Valley Forge, Houston, Texas, USA,

www.VFTIS.com, www.Kitba.com

Combined as companies, SPX Valley Forge and Kitba Consulting Services, L.P. form a large, global technical communications company. In 2002, Ms. Fee was appointed to the United States Department of Commerce's Houston District Export Council (DEC), a community service organization making a positive impact on economic development by increasing U.S. exports. She sits on three Advisory Boards: Houston Achievement Place, ESCAPE Family Resources and University of Houston – Downtown, Center for Entrepreneurship.



Cynthia A. Kase, President, Kase and Company, Inc., Reno, NV, USA, www.kaseco.com.

During stormy, unpredictable markets, Cynthia Kase was a 'life saver' to many who lost their advisors (brokers, dealers and market makers who exited the energy hedging business). She helped them weather large price swings and provided advice and software support to effectively hedge exposure. Her hedging support and advice saved \$50+ million dollars for more than fifty corporate and intuitional energy clients and energy customers left stranded when large market makers were no longer able to support them.



Cindy L. Keck, Vice President Sales, ABB Inc., Mars (Pittsburgh), Pennsylvania, USA,

www.abb.com

A few years ago, one of the largest US investor owned utilities faced severe reliability issues. Keck and a reliability team comprised of utility and ABB personnel convened. They determined installation of reclosers would solve part of the reliability problem. The team selected a one-product microprocessor solution. Over the past two years, Cindy gained this customer's confidence. Consequently, she was instrumental taking the account from \$0 in 2002 to \$1 million in 2004.

Carol Keirstead, Manager – Strategic Initiatives, Marketing Communications, GE Energy, Schenectady, NY, USA,



www.gepower.com

"She is a superb master at her craft," one nominator praised. "Every item of the program we did together was done creatively and magnificently to uphold the strong brand image of GE. The production was complex but flawless. She oversaw every detail. She interfaces exquisitely with people. She handles difficult situations with ease. She gives everyone a win-win situation, even when she has to go away and contemplate how that can be accomplished when people have overlapping or conflicting requests."

Kandy Lukats, Upstream Technology Consultants and Time Finders, Houston, Texas, USA



Kandy Lukats' specialty is upstream oil & gas software. Lukats' ability to mentor and coach a new generation of technology partners is highly prized. Formerly, as System Vice President, Exploration and Development for Landmark Graphics Corp., a Halliburton company, by being 'first' in the oil and gas software industry to apply management consulting principles to delivering software solution, Lukats enabled her clients to maximize technology to find oil and gas reserves. As a result, Landmark became a technology partner with its clients rather than a software vendor. She earned her first dollar just one week after launching two new companies in April 2004.

Sherry Lee MacDonald, Director, Corporate Risk Management, EPCOR Utilities, Inc., Calgary, Alberta, Canada, www.epcor.ca



Sherry Lee MacDonald joined EPCOR in November 2001 and was promoted to Director only 5 months later. A critical participant of the Corporate Risk Oversight meetings, she monitors and assesses risk and risk tolerance and enforces corporate policy and procedures. She helped establish a unique Board Committee on Risk Oversight to ensure thorough Corporate Governance at all levels. Her unique management style of enabling employees to self-manage utilizing cross-functional cross-capable teams enables her to train employees via their peers.



Evangelia (Lea) Souliotis, Supply Chain Specialist, Exchange, Horsham, West Sussex, England, United Kingdom (formerly BP, Houston, Texas, USA; Country of Birth: USA; Worked: Egypt; USA), www.enchange.com

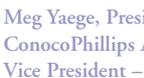
Lea Souliotis removed in 2004 to London to join Enchange. The recognition is for her work with BP, which she joined in 2000. After completing her Challenge Graduate rotation, she secured a position in the Egypt Business Unit and quickly established herself as a supply chain process analyst. She introduced a streamlined process that clarified each BU role and increased transparency of spend and personal accountability. She introduced the first e-procurement initiative to the business by establishing an online stationary agreement. Back in Houston, the first-of-its-kind process booklet she published guiding wells teams through various roles and responsibilities was so popular, Souliotis was asked to travel to each operating site deploying it.



Angela Strank, Technology Vice President –

Lubricants, BP, London, England, United Kingdom (recently returned from USA assignment), www.bp.com (Worked 2003: USA)

When BP purchased the Castrol company, Angela Strank's input and interactions were woven into the very fiber of the corporate integration. She maintained what Castrol employees might term the 'Castrol Heritage'. For two diverse companies with people from completely different cultures, she applied standards, set leading business units into motion and delivered significant profits. She earned the heart-felt respect and loyalty of the teams she left behind in the US when she recently returned to the UK.



Meg Yaege, President, ConocoPhillips Alaska Pipeline & Vice President – Greater Prudhoe

Bay, ConocoPhillips Alaska, Anchorage, Alaska, USA, www.conocophillips.com

Meg Yaege led an effort by TransAlaskan Pipeline System (TAPS) owners and Aliyeska Management to renew operation of TAPS for the next 20 years. Involved were renewed 30-year pipeline rights-of-way and a reconfiguration of pipeline equipment and operations to reduce costs by more than \$100 million gross dollars per year.

For Prudhoe Bay, she teamed with working interest owners to manage the transition of North America's largest oilfield to align interests and move to a single operator (BP). This paved the way for significant reduced future costs and contributed more than 50,000 gross barrels of oil per day.

POTENTIAL

For every energy task, there is a next generation leader already in training. 'Potential' honorees joined the energy industry since January 2001 and are already making significant contributions to energy.

Category 'Winner': Potential



Megan C. Gibbs,
OEM Marketing
Rep, ABB, Lake
Mary, Florida, USA, www.abb.com

Megan Gibbs is responsible for \$3.6M in sales in 2004, covering medium voltage breakers, switches and switchgear. She represents products designed and built in Florence, SC and Lake Mary, FL, with responsibility for all OEM accounts east of the Mississippi. Her customers are among ABB's largest. Also responsible for forecasting and market segment analyses, her efforts will be used to reposition ABB in the switchgear OEM market.

Starting with ABB only in September 2002, Gibbs joined ABB in the Marketing and Sales Trainee Program, an elite program for fast-track individuals. Based on successes in her first two eight-month assignments, Gibbs was offered her present position before the Trainee program was completed. Even prior to working for ABB, she won ABB's scholarship for Women in Engineering and spent one semester (Fall 2001) in Copenhagen, Denmark, through the Global Engineering Education Exchange (GE3).

Potential Category Honorees:



Allison Dancy, Executive
Assistant to the Executive
Director, Associate of the Oil and
Gas Development Partnership

(OGDP), Memorial University of Newfoundland, St. John's, Newfoundland and Labrador, Canada, www.mun.ca

Allison Dancy is recognized for her significant contributions to the facilitation of the dialogue between community, industry and regional government stakeholders in upstream energy developments. Her recent work as economic advisor to municipal government and with diversity issues has re-enforced her recognition of the necessity to align the needs and expectations of the "community of interest". As a member of the OGDP, she has taken a leading role in further developing this facilitation process.



Désirée Tremblay, Marketing
Coordinator, TM4, a subsidiary
of Hydro Québec, Boucherville,
Quebec, Canada, www.tm4.com

Following her university internship at Hydro Quebec, Désirée Tremblay showed initiative by offering, for her final school project, to develop and program a demonstration version of an expert system on energy efficiency in pumping systems.

Several years later, having completed 2 engineering degrees, Mrs Tremblay is again in the market of energy but in marketing with high tech company TM4 in power density and high efficiency technology. Tremblay analyses and retransmits to her team information on the wind turbine market and the generator-set market for distributed electricity production.



Charlotte E. (Dickerson) Wiley,
Mechanical Engineer/Technical
Advisor, Cummins Power

Generation, Maple Grove, Minnesota, USA,
www.cummins.com

Charlotte Wiley, who joined Cummins in April 2003, won the Society of Automotive Engineers Women's Engineering Committee Award for women's leadership in engineering for her human mobility work in charge of 3 major engineering projects for the Rochester products division of GM, now Delphi.

In June 2003, she was charged with reducing warranty costs in the consumer genset area. By year's end, exceeding targets, important product improvement projects were to improve overall genset quality and reliability as a system and as individual subsystems on the engine and alternator.

LEADERSHIP

The diverse energy industry is fortunate to have the following women at the helm during off-stormy times. Among the many industry giants, company chairs, chief executives, presidents and public servants are a few next-generation leaders moving up the ladder.

Category 'Winner': Leadership



Holly Koepfel,
Executive Vice
President – AEP

Utilities East, AEP – American
Electric Power, Columbus, Ohio,
USA, www.aep.com

As of June 1, 2004, Holly Koepfel is responsible for distribution and customer service operations in the states of Indiana, Kentucky, Michigan, Ohio, Tennessee, Virginia and West Virginia. The state presidents for each of the state regions listed now report to her.

In her previous position as Executive Vice President – Commercial Operations, since October 2002, she was responsible for AEP's commercial operations. She managed 42,000-megawatts (MW) of generation for nearly 5 million customers in 11-states, as well as fuel and commodity procurement, logistics, and trading and marketing activities for this North American mega-utility. Repositioning wholesale market activities around assets in 2002, this clear first-mover blazed the path others soon followed. She reengineered systems and processes, and improved efficiencies in anticipation of changes in regulatory and market conditions.

Since 2002, she lead AEP's exit from non-core activities in Europe, South America, Australia and China. She also divested the majority of AEP's North American independent power producer (IPP) projects and 4,500 MW of ERCOT (Texas) utility generation. Until the 2004 transition, she also had continuing responsibility for UK and natural gas operations.

Leadership Category Honorees:



Rita Bajura, Director, U.S.
Department of Energy/National
Energy Technology Lab (NETL),
Pittsburgh, Pennsylvania, USA, www.netl.doe.gov

As NETL Director, Rita Bajura oversees implementation of major science and technology development programs in fossil energy and environmental technologies, whether on-site or through partnerships and contractual arrangements with industry, universities, and other research organizations. One thousand NETL researchers conduct and implement approximately 1,100 projects in NETL's portfolio energy and energy-related science and technology development programs in such diverse areas as coal-fired power generation, natural gas, biomass, processing and former nuclear production site clean-up.



Carol Bartz,
Chairman of the Board, President
and CEO, Autodesk, Inc.,

San Rafael, California, USA, www.autodesk.com

Since Carol Bartz took the helm in 1992 of Autodesk, Inc., it has diversified its product line and grown revenues from \$285 million to \$952 million in FY04. Appointed to President Bush's Council of Advisors on Science and Technology, Bartz plays a key role in shaping the government's high tech agenda—ranging from R&D funding to new broadband incentives. She serves on the Board of Directors of BEA Systems, Cisco Systems, Network Appliance, and the Foundation for the National Medals of Science and Technology.



Becky Blalock, Senior Vice
President and Chief Information
Officer (CIO), Southern

Company, Atlanta, Georgia, USA,
www.southernco.com

In her role of CIO, Becky Blalock directs all aspects of Southern Company's Information Resources function to provide support and guidance in maintenance, operations and applications design for information technologies. She is responsible for more than 1,200 employees at five subsidiary utility companies serving nearly 4 million customers in four states. Blalock says she has a clear vision of where she would like to lead the organization, and her good communication is critical to achieving this vision.



Chairman Sharon Brown-Hruska,
Chairman, Commodities Futures
Trading Commission,

Washington, D.C., USA, www.cftc.gov.

Related honors: Key Women in Energy-Global 'Leadership' category 'winner'

With natural gas prices very volatile and crude oil hovering at all-time highs, Commissioner Brown-Hruska calls out for risk management strategies. She is trying to get a solution and design an approach for standards-based principals based rather than government mandate, especially for price reporting. She encourages transparency in markets, but does not support mandates to report to certain firms or publications and report all that data - without compensation - so markets may choose which platforms are traded on and how prices are discovered.



Jan Campbell, Corporate Secretary, Precision Drilling Corporation, Calgary, Alberta, Canada,

www.precisiondrilling.com

For the past ten years, Jan Campbell has capably served as the Corporate Secretary for Precision Drilling, Precision Drilling, the largest Canadian integrated oilfield and industrial services contractor, has a US\$2.5 billion market cap, which is big relative to other Canadian companies. Campbell's name appears on every financial statement, is presented to every analyst, and is recognized throughout the expanded operations of the company. For 2003, the company's EBITDA increased 211% over 2002.



Maria Consuela Campos, Human Resources (previously a negotiator), Shell, Bogotá, Colombia,

www.shell.com

Maria Consuela Campos, recognized herein for her negotiations and project development skills, has demonstrated unflinching high performance and flexibility. She has a sense of fairness and treats all people equal, no matter the social background or pedigree. She can sit with landowners one day, matching their tequila shots with hers and negotiating access rights to an oil pipeline, and the next day sit at a fancy dinner with the Minister of Energy doing the exactly same thing. She built her own career and success by proving herself first in Legal, then moving on to Commercial, HSE and HR functions.



Luisa Cipollitti, Industry Relations Manager, Statoil Venezuela, A.S., El Rosal, Caracas, Venezuela, www.statoil.com

Luisa Cipollitti is an oil and gas lawyer actively involved in Venezuela. As a manager at PDVSA (the national oil company) approximately six years ago, she negotiated documentation pertaining to the largest gas compression project in the world (nominator's designation). She later became the head of El Paso Energy in Venezuela. More recently, she joined Statoil. In each situation, she has shown her ability to be a leader, tough negotiator and excellent representative of energy.



Kim Clark, Vice President and Controller, Entergy-Koch Trading, LP (EKT), Houston, Texas, USA, www.energyskoch.com

Kim Clark is team leader. She played a key role in the development process and recruiting efforts of EKT's overall accounting organization from the company's inception. A first-rate mentor with an entrepreneurial outlook, Clark inspired and retained a cadre of dedicated employees whose knowledge and dedication are part and parcel of EKT's stability and success. She manages all accounting and risk control functions for EKT and directs the information technology priorities for the company.



Kathleen Clarke, Director, Bureau of Land Management, Department of the Interior

Washington, D.C., USA, www.blm.gov

Kathleen Clarke has significantly advanced the National Energy Policy's principles and directives. She has improved access to energy resources while promoting sound environmental practices. In the Powder River Basin, Clarke successfully negotiated an agreement among states, tribes and affected federal agencies that protects air and water resources while permitting access to over 7 Tcf of natural gas. Clarke is dedicated to maintaining balance among all public land users by fostering strong working relationships with every stakeholder.



E. Renae Conley, President & Chief Executive Officer (CEO), Entergy Louisiana, Baton Rouge, Louisiana, USA, www.entropy.com

Renae Conley runs a fast-paced and innovative leadership. As Conley drove improvements in the utility, she also fostered strong programs to support the community, environment, and less fortunate. As a result, customers placed Entergy in the top tier of the southern region in the J. D. Power national survey, describing the company as "honest, ethical, and efficient." This talented and creative leader positioned Entergy Louisiana as a top-performing utility company.



Linda Cook, President and Chief Executive Officer, Shell Canada Limited, Calgary, Alberta, Canada, www.shell.com

In August 2003, Linda Cook became President and Chief Executive Officer and a Director of Shell Canada Limited. Prior to her appointment, this member of each the Society of Petroleum Engineers, Board of Directors of the Boeing Company, Harvard School of Government Dean's Council and Canadian Council of Chief Executives had been, since 2000, Chief Executive Officer for Shell Gas & Power based in London, responsible for the global natural gas and power generation activities of the Royal Dutch/Shell Group.



Ann B. Curtis, Executive Vice President and Vice Chairman, Calpine Corporation, San Jose, California, USA, www.calpine.com

A Calpine co-founder in 1984, Ann Curtis exemplifies a 'powerful' leader. She helped grow Calpine from 3 to 3,500+ employees. Curtis believes, "Integrity is the key to success for energy companies." She insists Calpine's financial reporting be accurate and transparent, and ensures compliance with the Sarbanes-Oxley Act. She emphasizes employee safety and refines the company's environmental stewardship strategy and messages. Curtis established a Calpine Foundation to support volunteer service. Her hobby is breeding championship American Paint Horses.



Kathleen 'Kathy' Eisbrenner, President, Excelerate Energy, (Previously head of LNG, El Paso Global LNG), The Woodlands, Texas, USA, www.excelerateenergy.com

Texas-based LNG infrastructure development and trading company Excelerate, run by Kathy Eisbrenner, is currently building what it claims as the first off-shore LNG receiving terminal in the world, and the first new LNG receiving terminal to serve the US in more than 20 years - the Excelerate Energy Bridge Gulf of Mexico. Excelerate purchased Energy Bridge technology rights from El Paso in December of 2003, and has plans to build several new LNG receiving facilities.



Lynn Laverty Elsenhans, President, Shell Oil Company; President & CEO, Shell Oil Products U.S., USA, Houston, Texas, USA (Worked 2003: UK), www.shell.com

Lynn Laverty Elsenhans graduated from Rice University and Harvard. She held increasing management positions with Shell in refining, marketing, lubricants and natural gas with a track record of turning around underperforming businesses.

She helped start the first women's network at Shell. Her efforts being instrumental in developing and promoting women culminated in being awarded the 2004 Catalyst award. Before being named President and Country Chair Shell Oil Company and CEO Shell Oil Products US, she spent four years overseas.

Sarah Emerson, Managing Director, Energy Security Analysis Inc. (ESAI), Wakefield, Massachusetts, USA, www.esai.com

Sarah Emerson has developed many of ESAI's unique analytical tools for analyzing the oil market and forecasting oil prices. She has conducted several industry studies on topics ranging from the transfer of pollution in energy trade to the future of gasoline markets to the future of the Russian oil industry. Currently, she is an adviser to the U.S., Japanese and Indian governments on energy security issues.



Diana Espinosa Pacheco, Chief Strategic Planning and Risks Officer, Ecopetrol S.A., Bogotá, D.C., Colombia, www.ecopetrol.gov.com

Diana Espinosa Pacheco led the reorganization and transformation of the Colombian oil & gas industry approved by the government in 2003. This first major change of the industry in Colombia since 1970 when the association contract was designed took place in fewer than six months, yet influenced policy, strategy, approach, and a gear shift in the way to run business and for future developments. It removed the state role of exploration and production (licensing) from the company to flip barriers in order to achieve higher development and efficiency.

She has been President of Arpel and a member of the Board of Directors of Ocenasa.



Dr. Michelle Michot Foss,
Executive Director, Institute for
Energy, Law & Enterprise, Univ
of Houston, Houston, Texas, USA, www.uh.edu

Her specific expertise is in North American natural gas and gas/power convergence; devised concept of "commercial frameworks" to capture integration of legal, regulatory, financial regimes with economics of the energy value chains for best practices in energy sector reform and management. She is an expert on the Mexican energy sector. She is a member of energy experts groups for Senate Energy and CIA.

She served as 2003 president of the International Assoc for Energy Economics (IAEE).



Robbie Gries, President & owner,
Priority Oil & Gas, Denver,
Colorado, USA

Robbie Gries is the past president of the American Association of Petroleum Geologists (AAPG). She served from July 2001 –June 2002. Gries has been described as a dynamo. Personality exudes from this woman who will engage conversation on oil and gas on a moment's notice and who proudly boasts that her 'country of Birth' is the state of Texas.



Lois Hedg-peth, President U.S.
Operations & Executive Vice
President, Business Development
& Marketing, Centrica North America, Stamford,
Connecticut, USA, www.directenergy.com;
www.centrica.com

Not even 20 months into retail natural gas and electricity industries, Lois Hedg-peth has successfully transferred 23-years of telecommunications industry experience to help achieve record growth and financial gains for Centrica plc in the U.S.

Customer growth is a trademark of Hedg-peth's career. Centrica successfully competed in metro areas of Texas to achieve 59 percent year-over-year growth in customer numbers in 2003. In February 2004, Centrica reported operating profits from North America operations increased 106 percent in 2003.



**Sheila Slocum Hollis, Managing
Partner, Duane Morris,
Washington, D.C., USA,**
www.duanemorris.com

Sheila Hollis serves on the Executive Committee and Partners' Board of Duane Morris. Specializing in domestic and international energy, water and environmental matters, she practices in the areas of energy transactional and regulatory law, and international and administrative law before government agencies, the Congress and other entities.

She serves on the Standing Committee on the Federal Judiciary. She is past chair of the Section of Environment, Energy and Resources of the American Bar Association and, past president of the Women's Council on Energy and the Environment.



**Judith 'Judi' Johansen, President
and CEO, PacifiCorp, a Division
of Scottish Power, Portland,
Oregon, USA, www.pacificorp.com**

Judi Johansen's leadership was called into action recently when a movement got underway to create a Portland area People's Utility District (PUD). Johansen, only two years into PacifiCorp presidential tenure, led a tough anti-PUD campaign, was actively involved in all facets, including public hearings and media interviews, and motivated hundreds of PacifiCorp employees in a grassroots volunteer effort.

Over several Saturdays, she personally led employees walking through local neighborhoods, knocking on doors. She gained respect from many surprised citizens. When voters overwhelmingly rejected the PUD measure, many observers credited it to both Johansen's leadership and PacifiCorp employees' efforts.



**Fran Keeth, President and Chief
Executive Officer (CEO), Shell
Chemical LP; and Deputy Chief
Executive Officers and Executive Vice President of
London-based Shell Chemicals, Ltd.; Houston,
Texas, USA; www.shell.com/chemicals**

Fran Keeth is a strong supporter of diversity in the workplace and seeks to create an environment where an employee 'can bring his or her whole self to work without worrying about trying to fit in'. She is a strong supporter of sustainable development and corporate responsibility. She also serves on the Board of Directors of the American Chemistry Council and the Society of the Chemical Industry.



**Carin S. Knickel, Vice President,
Human Resources,
ConocoPhillips, (Previously
President, ConocoPhillips Specialty Businesses),
Houston, Texas, USA, www.conocophillips.com**

Carin Knickel is now in charge of Human Resources (HR) for every ConocoPhillips company in the globe, in most countries around the globe, and for shaking the very core of HR, business perspective and a technical perspective. Her role is of major importance to the global, and rapidly changing, face of ConocoPhillips since she is applying business practices to the HR model from her last role as President of ConocoPhillips' Specialty Businesses.



**Rebecca
MacDonald,
President &
Chief Executive Officer (CEO), Ontario Energy
Savings Corp. (OESC), Toronto, Ontario, Canada,
(Born: Yugoslavia) www.oesc.ca**

Rebecca MacDonald immigrated to Canada from Yugoslavia and created, from its inception in 1997, a company with an approximate current \$2 billion (Canadian) in market cap. OESC, one of the largest independent energy marketers in Canada, is an independent natural gas and electricity marketing company committed to reducing and stabilizing energy costs for consumers. It provides an attractive alternative to more than half a million customers who traditionally had no choice when purchasing their natural gas and electricity supply.



**Hilda Mackow,
Chief Executive Officer,
Mackow Communications Inc.
Toronto, Ontario, Canada**

Hilda Mackow heads Mackow Communications serving retail, energy and non-profit sectors with strategic marketing, brand development, advertising and public relations. She spent several years in the oil industry (Esso) and more recently as Chief Executive Officer & President of Toronto Hydro Energy Services, where she built a successful retail/wholesale energy business.

Throughout her career, Mackow has been instrumental recruiting and mentoring women in the energy. Mackow hosts quarterly "networking events" for women.



**Leslie Mays,
Royal Dutch
Shell; Head of
Global Diversity, Shell Oil Company, London,
UK, and transferred late 2003 to Houston, Texas,
USA, www.shell.com (Country of Birth: USA)**

Leslie Mays positioned Shell as a multi-national corporate leader by establishing a global Diversity and inclusiveness standard. Her leadership actions resulted in a 140% increase in women (over 5 years) at senior levels and 78% coverage of country leadership roles held by local nationals. She established 16+ women's network groups over several years. She helped Shell earn D&I awards around the world in the UK, Malaysia, The Netherlands and the U.S.

She served as the National President of the Coalition of 100 Black Women.



**Rae McQuade,
Executive Director, North
American Energy Standards
Board, Houston, Texas, USA, www.naesb.org**

Rae McQuade has been instrumental in leading the development of the North American Energy Standards Board (NAESB) from an organization focused strictly Natural Gas issues into a highly respected standards development organization for the Electric and Natural Gas industries. Under her leadership, NAESB has achieved several significant accomplishments. It established NAESB as an ANSI Standards Development Organization. It also established a formal collaboration with the North American Electric Reliability Council (NERC) and the ISO/RTO Executive Council.



**Alejandra Nicoli, Director of
International Division, Tecpetrol
S.A., Buenos Aires, Argentina,**
www.tecpetrol.com

Alejandra Nicoli is Head of the International Division of Tecpetrol S.A., an Argentine Oil Company with its Head Office in Buenos Aires, Argentina and operations in Peru (Camisea Project); Venezuela (Colon), Ecuador (Bermejo) and recently Mexico (Mision). Her diverse early background - she started as a journalist, studied psychology and is now a lawyer - was a strength as she helped construct gas contracts and policies for large oil blocks.



**Jane L. Peverett, Chief Financial
Officer, BC Transmission
Corporation (BCTC), Vancouver,
British Columbia, www.bctc.com.**

At newly formed crown corporation BCTC, Jane Peverett has been instrumental in defining the new corporation mandate and responsible for establishing corporate functions, including Treasury, Risk Management, Procurement, Internal Audit, Insurance and Regulatory Affairs. One most important step BCTC must take in its first year is to file its own open access transmission tariff with the regulator. The design of this tariff is her responsibility.

As a board member of the Canadian Gas Association, she advocated a fundamental association focus change. Peverett was recently appointed to the Board of Directors of Encana Corporation. Until May 2003, she was President, Union Gas Limited, a Duke company, in Ontario, Canada.



Jill Prince, Senior Manager,
Hitachi Consulting, Utility
Practice, Dallas, Texas, USA,

www.hitachiconsulting.com

Having led multiple critical initiatives in design and implementation to support a deregulated Texas marketplace, Jill Prince played an active role in the selection and implementation of rules, processes and procedures necessary to get Texas deregulated electricity market up and running. She continues with market refinements and enhancements regarding market migration to the North American Energy Standards Board (NAESB) and implementation and migration of the entire market to TX Set 2.0 from TX Set 1.6.



Gabriela Rachadell de Delgado,
Partner, Macleod Dixon –
Caracas, La Castellana,
Caracas, Venezuela,

www.macleoddixon.com.ve

Gabriela Rachadell de Delgado has been actively involved in the energy business for approximately 10 years. She is a leading energy practitioner in Venezuela, and has also acted as an external advisor to the Energy and Mines Commission of the Venezuelan Congress. She actively participated in conferences and published extensively in the areas of natural resources and energy. She also sits as secretary to the board of a major oil and gas joint venture.



Deborah D. Resley, Owner, DR
& Associates, Houston, Texas,
USA

Deborah Resley U.S.-based, yet works internationally in Trinidad & Tobago, Egypt and Peru. She currently supports a Greenfield LNG project that will be a Client's entrée into LNG and a first gas export project for the country. As she experienced in supporting Trinidad's entrée into LNG, these projects have an enormous impact on a country's gross domestic product.

Resley is a Director on the Board of the Association of International Petroleum Negotiators (AIPN).



Mary Ellen Richardson, President,
Association of Major Power
Consumers of Ontario, Toronto,

Ontario, Canada, www.ampco.org

A strong advocacy song rings so clear in the North that it reverberates to energy newsrooms in Washington, D.C. and back again. Mary Ellen Richardson uses her very public voice to advocate competitive electricity rates and promote a reliable supply of electricity for all consumers for the province-wide association. AMPCO members represent a wide range of resource, manufacturing and processing industries that consume approximately 18% of Ontario's electrical energy.



Dilma Rousseff,
Minstra de Minas e Energia
(Minister of Mines and Energy),

Ministry of Mines and Energy,
Rio de Janeiro, Brazil

Energy Minister Dilma Rousseff commands attention, whether it is in energy or mainstream news or from the podium in a room packed to hear her. For example, in December 2003, when Petrobras cut natural gas import prices Bolivia for domestic distributors for volumes in excess of standard use, and claimed it would increase clean-burning fuel use across Brazil, Energy Minister Dilma Rousseff called for a master plan to keep prices low and still increase usage of natural gas.



Betsy Spomer, Vice President,
BG North America, Caribbean
and Global LNG,

Houston, Texas, USA, www.bg-group.com

Betsy Spomer is a key player in the successful LNG re-emergence in the US market. This benefits BG Group, the U.S. natural gas market and the wider LNG industry. Spomer joined BG Group in June 2002 as Vice President, Global LNG, and Chief Executive Officer of BG LNG Services LLC. Her success in delivery can be measured. BG's global LNG developments are widely regarded as the industry success model to be emulated. In 2003, BG Group subsidiary BGLS was the largest LNG importer into the U.S.



Suzanne Suter, Vice President,
Corporate Secretary and Chief
Governance Officer, Anadarko

Petroleum Corporation, The Woodlands, Texas,
USA, www.anadarko.com

Suzanne Suter has a unique gift of inspiring loyalty from all who work with her. Her mentoring personality and long-term excellence in corporate governance and corporate culture inspire those around her to personal excellence. In 2002, Suter was recognized for corporate governance leadership with election as Anadarko Vice President and Chief Governance Officer. Active in the American Society of Corporate Secretaries through the years, Suter has served both as national level director and local chapter officer.



Lori Staffin Traweck, Senior Vice
President, Operations and
Engineering Management,

American Gas Association, Washington, D.C.,
USA, www.aga.org

Lori Traweck's AGA focus is advocating operational issues on behalf of natural gas utilities in conjunction with providing members information and services to help them achieve operational excellence in safe, reliable, efficient – and post 9-11, secure delivery of natural gas. In 2002, a significant piece of pipeline safety legislation and security guidelines for gas utilities passed that would effectively address homeland security concerns. 2003 brought effective pipeline safety regulation and security implementation, plus an integrated industry effort to ensure continual improvement.



Beverly Van Ruyven, Senior Vice
President – Distribution, BC
Hydro and Power Authority,

Vancouver, British Columbia, Canada,
www.bchydro.com

Beverly Van Ruyven is responsible for leading BC Hydro's Marketing and Sales activities, including the highly-successful PowerSmart marketing program. She is also responsible for leading the teams that deliver products and services to BC Hydro's 1.6 million plus domestic, commercial and industrial customers.

Executive Committee and Selection Committee for Key Women in Energy-Americas

- Alma Del Toro-Baltaci, BP Castrol, USA,
www.bp.com
- Erroll Davis, Alliant Energy, USA,
www.alliantenergy.com
- Deborah Florito, 20 K Group, USA,
www.20kgroup.com



Patricia A. Woertz, Executive Vice
President for Global Refining and
Marketing, ChevronTexaco,

San Francisco, California, USA,
www.chevrontexaco.com

Patricia Woertz oversees four regional refining and marketing companies selling Chevron-branded products in North America, Texaco-branded products in Latin America and Europe/West Africa and Caltex-branded products in Asia/Middle East. The downstream business includes 2,000 employees, 20 wholly owned or joint venture refineries on five continents with 2.2 million barrels per day of refining capacity and 25,000 retail sites worldwide.



Claritza Zavarce, Manager
Human Resources, BP Venezuela
Holdings Limited, El Rosal,
Caracas, Venezuela, www.bp.com

Claritza Zavarce maximizes people value. Her leadership skills flourished during the Venezuelan Crisis (coup and general strike). Always looking for ways to challenge, motivate, recognize and reward, her "can do" attitude rubbed off on staff and the entire leadership team, and gave them strength to face an extraordinary challenge: the company decided to divest assets in Venezuela where most of the organization resides. At once, more than 350 people felt the emotional hit of facing the reality of losing their jobs in a very depressed job market or being transferred to a new unknown operator. Together, they delivered a transition 'people agenda' praised by many, most importantly by employees.



Sophie Zurquiyah Rousset, Latin America South
General Manager, Schlumberger Ltd.,
Rio de Janeiro, Brazil, www.slb.com

(Country of Birth: USA; Reared: France & Brazil)

As Schlumberger's GeoMarket Manager since March 2003, Sophie Zurquiyah Rousset is responsible for OFS business in Brazil, Argentina, Bolivia & Chile and oversees 1400 people. Previously, from July 2000 to September 2003, she was SCD Center Manager, Sugar-Land, Texas, where she was responsible for the site, both from the Technology perspective of engineering of new products and services support to the Field and for the manufacturing P&L.

- Carlos Garibaldi, The Scotia Group, USA,
www.scotia-group.com
- Jackie Lafontaine, Shell International Exploration
and Development, USA, www.shell.com
- Gerrit Maureau, Memorial University of
Newfoundland, Canada, www.mun.ca
- Karyl McCurdy Lawson, Energy Consultant and
Attorney-at-Law, USA
- Her Britannic Majesty's Consul-General,
Iain R. Murray, USA www.britainusa.com/houston
- Shirley Neff,
Goldwyn International Strategies, USA
- Amanda Pereira, ARPEL-Asociación Regional de
Empresas de Petróleo y Gas Natural en
Latinoamérica y el Caribe, Uruguay, www.arpel.org
- Linda K. Rader, Rader Energy, & Chair, Key
Women in Energy Awards, USA,
www.keywomeninenergy.com
- Diane Webb, Hitachi Consulting, USA,
www.hitachiconsulting.com

WISDOM

'Wisdom' category honorees are as diverse as the corporate counsel, executive guidance and careful, articulate advice for which they are deservedly recognized.

Category 'Winner': Wisdom

Alicia Izarraraz, Works General Manager, BP Amoco Chemical Company-Chocolate Bayou Works, Alvin, Texas, USA, www.bp.com

(Country of Birth: Mexico)

The nomination for Alicia Izarraraz, a compilation from three people with past dealings with her work and life, was unique among nominations.-LKR

"Alicia Izarraraz's flair for wise decisions and motivating others to perform was recognized by the fact that for about one year, she ran the refinery without a dedicated Business Unit Leader (BUL, the CEO of a refinery in BP if you will)," the nominator wrote. "Alicia was successful in this environment because she led through encouragement, and innovation of her people and not by financial numbers alone."

To help communicate more effectively, a quarterly refinery newsletter at the Refinery was initiated and developed by Izarraraz. She would actually deliver these newsletters to the field and ask people to ask more questions about the state of the business and what they can do to help improve performance.

When still new to the Texas City refinery (approximately 460,000 barrels of oil/day and described as one of the most complex refineries in the world), it was reported that two co-workers pitched a budgeting and reporting tool to the BUL/Site Director, which was flatly rejected. "When we walked out of the meeting," one noted, "Alicia gave me the number of a key person from (another plant) who did this and gave us her full support to put the tool in here. How has that benefited us? It increased the flexibility and data integrity of budgeting and reporting processes and is so easy to use I have seen Superintendents pull their financial data... and was done on the cheap (less than \$50,000 for the refinery)."

'Wisdom' Category Honorees:

Melinda Ackerman, Senior Vice President, American Electric Power (AEP), Columbus, Ohio,

USA, www.aep.com

Melinda Ackerman's insight, based on "been there, done that" experience, was instrumental in building the new AEP Daily, she guides the helm of the human relations ship through rough waters of increasing health costs, "downsizing," plummeting 401k plans, etc. for more than 20,000 employees in 11 states. She carries out leadership with a calm, steady hand -- one so reliable and quiet that few employees take notice, yet senior management takes great pride in her abilities.



Lisa Bodensteiner, Executive Vice President and General Counsel, Calpine Corporation, San Jose,

California, USA, www.calpine.com

Lisa Bodensteiner leads Calpine's 35-person, \$15 million legal staff. Serving as Chief Ethics Officer, she plays an important role in directing activities to insure compliance with Calpine's #1 priority – ethical operations. With her direction and guidance, Calpine has been acknowledged as a leader in ethical business practices during a time of heightened scrutiny. In her 'spare time', Lisa and husband Bill run an active household of 8 children, the youngest of whom was born in 2004.



Pamela F. Boschee, Independent Environmental Consultant, (formerly Managing Editor,

PennWell Corp.'s Electric Light & Power magazine, www.PennWell.com), Tulsa, Oklahoma, USA

Straight-shooting Pam Boschee considers as her forte understanding how the industry "really" works. Trained as a chemist and an environmental compliance project manager, she delivers a refreshing breeze of honesty and respect to the industry professionals and colleagues with whom she works. Serving as the managing editor of PennWell's Electric Light & Power the last four years, Boschee established herself as a thought leader through her often controversial commentaries.



Heather Broeder, P.E., Mechanical Facilities Engineer, Mustang Engineering, L.P., Houston,

Texas, USA, www.mustangeng.com

Heather Broeder works as a project engineer, but also facilitates a developmental program for young graduates. With more than 70 "Young Guns" now at Mustang, Broeder is involved with the daily responsibilities of program implementation (presentation meetings, field trips, etc.) plus launching initiatives company wide that stem from the growing momentum around utilizing young talent at Mustang. These initiatives range from involving Young Guns into Business Development efforts to an "exchange program" with Wood Group.



Johnnie Burton, Director, Minerals

Management Service (MMS), U.S. Department of Interior, MMS, Washington, D.C., USA, www.doi.gov (Country of Birth: French Algeria)

In 1978, 'Johnnie' Burton founded Hotline Energy Reports, which later merged with Dwight's Energydata (now HIS). In 1989, she helped her husband manage a small, gas production-focused exploration company in Wyoming's Wind River Basin, and taught at the University of Arkansas. In 1994, she joined the cabinet of (then) newly elected Governor of Wyoming, with whom she became acquainted when they were 1980's colleagues in the Wyoming House of Representatives. Burton was appointed to direct the MMS in 2002.



Sharon Jones Clayton, Chairman & Chief Executive Officer (CEO), Moore, Clayton & Company, Los

Angeles, California, USA, www.mcglobal.com

Sharon Jones Clayton co-founded Moore, Clayton & Co (MCC), global strategic and financial services business crossing multiple vertical markets. Energy Advisors, which Sharon was instrumental in setting up, has a diverse global client base serving anything from a US West Coast energy technology play to a UK wind farm developer to a European oil and gas company looking for strategic partners. One recent travel schedule linked Atlanta, London, Paris, Cape Town and Los Angeles.



Elisabeth Eljuri, Socio/Partner, Macleod Dixon, Caracas, Venezuela,

www.macleoddixon.com.ve

Elisabeth Eljuri is a strong leader and role model in the Latin American oil and gas legal arena. One of the founding partners of the Caracas office of international energy firm Macleod Dixon, she helped build it in six short years to one of Venezuela's 7 largest firms. Eljuri co-headed the Macleod Dixon team that advised Pemex in its upstream gas opening round. She is the Latin American representative to the Harvard Law School Association. She serves as President, Jessup Foundation of Venezuela, which coaches and sponsors the strong Venezuelan team in the largest law worldwide competition. Related honors: 2004 Key Women in Energy-Global awards – 'Wisdom' category 'winner'



Dawn Farrell, Executive Vice President – Generation, BC Hydro and Power Authority, Vancouver,

British Columbia, Canada, www.bchydro.com

Dawn Farrell is responsible for managing BC Hydro's large and complex inventory of generation assets throughout the province of British Columbia. These include many different hydro-related facilities, several very large ones and a number of smaller ones. She leads a team of approximately 600 people in the general line of business.



Leslie N. Haines, Editor, Hart Energy's 'Oil and Gas Investor' magazine, Houston, Texas, USA,

www.hartenergy.com

Leslie Haines is best known for keen observation and commentary, coupled with striking photographs, of the upstream North American petroleum industry. Whether through an emerging Rocky Mountain natural gas play or new private equity market financing structure, her 20-year mission has been to develop an educational link between executives of oil and gas companies and members of the investing and banking communities. In an otherwise transitory press world, her staff longevity averages an 18-20 years on the same publication.



Wendy Hall, Director, Public Relations, Halliburton, Houston, Texas, USA,

www.halliburton.com

Wendy Hall was promoted in 2004 for her exceptional work for a company that is daily in local, regional and international news for one logical reason – she handles herself and treats with respect those powerbrokers with whom she deals. She throws in humor and makes people feel comfortable. This year, she manages the image of both a major player in Iraqi reconstruction and, in an election year, the company previously headed by the sitting U.S. vice president.



Christine Hansen, Executive Director, IOGCC – Interstate Oil and Gas Compact Commission, Oklahoma City, Oklahoma, USA,

www.iogcc.state.ok.us

Christine Hansen serves as Liaison for Resolutions Committee, Finance Committee, Steering Committee, Nominating Committee, Legal and Regulatory Affairs Committee. Her work involves 39 US states – anything dealing with [oil and natural gas] production. This crusader works with governments to make industry fully understand and accept how important energy is for their economies. She has influence – not just surface influence, but the kind that makes top level executives and governmental group heads get off the other telephone line to speak with her.



Paula McCann Harris, Global Collaborative Projects Manager, Schlumberger Excellence in Educational Development (SEED), Schlumberger Ltd., Sugar Land, Texas, USA,

www.schlumberger.com

In February 2004, Texas Governor Rick Perry named Paula Harris to the 22-member Texas Energy Planning Council whose mandate is to determine how oil and gas reserves and alternative energy sources can be developed. They must write the state's first energy business plan since the mid-80s by December 31, 2004. She works with SEED, Schlumberger's community development program. This author of *For Sister: 'The Guide for Professional Black Women'* also assists *'Project Row Houses'*, a public art project.



Catherine Hughes, President,

Schlumberger Canada, Ltd. and Geomarket Manager, Canada, Schlumberger Ltd.,

Calgary, Alberta, Canada, www.schlumberger.com

According to Catherine Hughes, the achievements of Schlumberger Canada result from her team's work, not hers. The team, not her personal achievements, brought favor to the company. Her global Schlumberger experiences benefit the team as the Canadian environment is extremely complex. This French national's vision comes about in thinking outside ordinary circles for creative solutions addressing more than 500 customers, multiple competitors, very cyclical drilling activity, different field maturity levels (from East Coast pure exploration to shallow gas).

Special Recognition:



Judith Marie 'Judy' Johnson (1947-2002), formerly Partner, Vinson & Elkins, L.L.P.,

Houston, Texas, USA.

The late Judy Johnson was nationally recognized for her legal expertise in the energy regulatory field and related pipeline transactional matters. Until the time of her death, she maintained a substantial practice representing numerous natural gas industry clients on consultative matters, in the courts and before Federal regulatory agencies. A sought-after speaker at energy industry seminars and symposia, this member of the Energy Bar Association served for many years on the Editorial Board of Thompson Publishing Group's 'Natural Gas Contracts'.

Johnson was an ardent supporter of the Houston Ballet Foundation.



Marianne Kah, Chief Economist, ConocoPhillips, Houston, Texas, USA, www.conocophillips.com

A scenario planning expert, Marianne Kah facilitated multiple internal scenario exercises, mostly notably on the North American natural gas & power outlook. She is doing staff work to support the ConocoPhillips' Chairman in his role as Commissioner of the Hewlett-Foundation sponsored National Commission on Energy Policy. She served as 2003 Chair of the Committee on Economics and Statistics for the American Petroleum Institute. She is 2004 President-elect of the U.S. Association for Energy Economics (USAEE).



Suedean G. Kelly, Commissioner, U.S. Federal Energy Regulatory Commission (FERC),

Washington, D.C., USA, www.ferc.gov

Through U.S. Senator Jeff Bingaman's (D-New Mexico) recommendation, Suedean Kelly became a Commissioner at FERC in November 2003. Still quite new to the Commission, she is in the early stages of making her mark on it. In 2000, while on leave from the University of New Mexico School of Law, Kelly served as counsel to the California Independent System Operator. In 1999, she was a Fellow at the U.S. Senate Energy and Natural Resources Committee.



Dr. Suzanne Maloney, Middle East Advisor, ExxonMobil, Washington, D.C., USA,

www.exxonmobil.com

Responsible for government relations and public affairs related to the Middle East, Dr. Suzanne Maloney's work includes political and economic analysis, communications and media guidance, public outreach activities and government relations strategy. She is the author of *Ayatollah Gorbachev: The Politics of Change in Khatami's Iran* and several articles and book chapters on Iran and the Gulf region. Her previous positions include management of an educational program for the Kuwaiti Ministry of Foreign Affairs.



Emily McAnally, Director of Product Development, Work Suite, Houston, Texas, USA,

www.worksuite.com

As development director, Emily McAnally takes a unique approach to developing a suite of well-received products focused on enterprise and mobile work management. Her approach has been targeted toward designing applications focused on the user in a utility. She developed a methodology of understanding the user's role within the organization and designing different user interfaces from that customer's perspective. One example would be for an outside contractor within a utility to access their work via a Web portal.



Sherry A. Quirk, Senior Partner, Sullivan & Worcester, Washington, D.C., USA,

www.sandw.com

Sherry Quirk is recognized for her representation of Southeastern U.S. consumer-owned utility systems with respect to their continued access to low-cost 'preference' power from the federal government. She is also known for coalition building between consumer and investor interests on consumer protection provisions in energy legislation.

In a significant pro-bono activity, Quirk co-founded and co-leads First Star, a national non-profit organization dedicated to enhancing rights of children to be free from abuse and neglect.



Janelle M. Reese, Plant Manager, Koch Nitrogen Company, Fort Dodge Plant, Fort Dodge, Iowa, USA, www.kochind.com

With Koch Nitrogen Company's expansion in 2003, Janelle Reese began leading a two-plant, round-the-clock Iowa nitrogen production facility that provides UAN and ammonia fertilizers to Midwestern corn belt farmers. She and her team have worked to consistently improve safety and environmental performance and increase the plants' efficiency and operational reliability.

She was promoted into this role in mid-2003 to bring Koch's business philosophy and approach to a different "culture". Introducing a totally different work environment worked. Employees now boast of their plant performance.



Basma Anise Shalaby, Chief Engineer, Atomic Energy

of Canada Limited (AECL-Énergie atomique du Canada Limitée), Mississauga, Ontario, Canada, www.aec.ca (Country of Birth: Egypt)

Since her appointment in 1997, Basma Shalaby has been accountable for technical soundness of products and services delivered both to external customers and within AECL. A registered Professional Engineer with almost 30 years of nuclear experience, Basma was previously involved in the technical negotiation and definition of scope for the Qinshan Units 1 and 2 Project in China.

Shalaby holds a B.Sc. and M.A.Sc. in Chemical Engineering from the University of Cairo and University of Waterloo, respectively



Linda Silinsky, Manager, External Communications, Schlumberger Ltd., Sugar Land, Texas, USA,

www.schlumberger.com

If the oilfield services division of Schlumberger Ltd. is involved in public issues or is being discussed in the media, chances are excellent that Linda Silinsky has touched it and blessed it with her approval. She sets the standard for excellence in corporate communications. Her participation is as much a comfort to journalists seeking the proper source within Schlumberger as to inside executives seeking to have a message disseminated externally to the industry or to interested parties.



Leila L. Vespoli, Senior Vice President and General Counsel, FirstEnergy Corp., Akron, Ohio, USA, www.firstenergy.com

Not only is Leila Vespoli presiding over all legal affairs for FirstEnergy Corp., but is a guiding force in helping the company surmount the extraordinary challenges facing it as a result of the historic August 14, 2004, blackout in the U.S. Northeast. Her work, literally, is involved in one of the hottest, most important issues facing the entire global energy industry. Her actions, and those about her, could affect the future of the industry.

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The Homogeneous SA

“Substation Automation” Solution

By: Max Degerfalt and Graham Herriman, ABB Inc. Canada

The Conventional Solution

The substations in the electrical power system have undergone considerable developments through the use of modern primary apparatus, the use of microprocessors in the secondary equipment and the improved speed and capacity of communication to and within the substation. However at the same time the concept of building the stations has been very static and conservative using a considerable amount of discrete items and equipments such as control cables, control, metering and protection devices, RTU's for SCADA communication etc.

Owners have conventionally segregated the responsibilities for control, protection, metering and communication both in terms of responsibilities and hardware. Design standards have been used in the power utilities for many years limiting the possibilities to fully adopt modern technologies and the full utilization of the emerging computer and Intelligent Electrical Device (IED) technologies. Standards have a great advantage in the management of stations for maintenance personnel but limit migration towards modern technologies. Stringent rules for maintenance often prevent effective and cost-saving use of the most modern equipment and the benefits of extensive self-supervision and self-testing facilities.

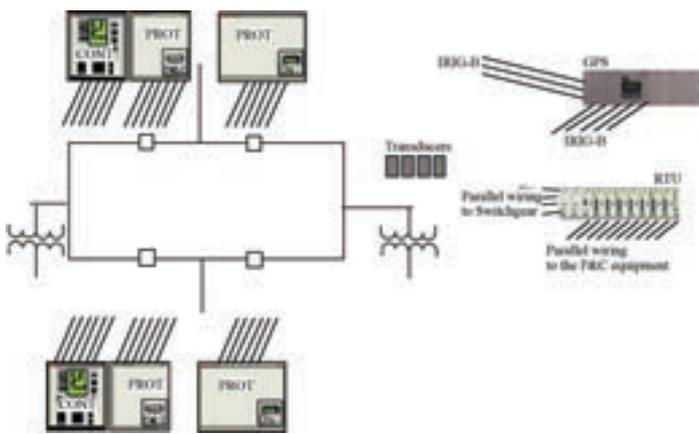


Figure 1. The structure of the typical North American substation using extensive discrete device wiring from each protection, control, instrumentation device, RTU and primary equipment.

System architecture for a modern homogeneous Substation Automation (SA) system.

The Modern Substation Automation system (SA) is an open system. On station level the Ethernet or other high-speed station bus (e.g. LON) allows the integration of any equipment conforming to these standards. The basic configuration of a modern homogeneous SA system and its various components are illustrated in Figure 2. The system consists of a bay level, a station level, and an interconnecting communication medium, the Station-bus.

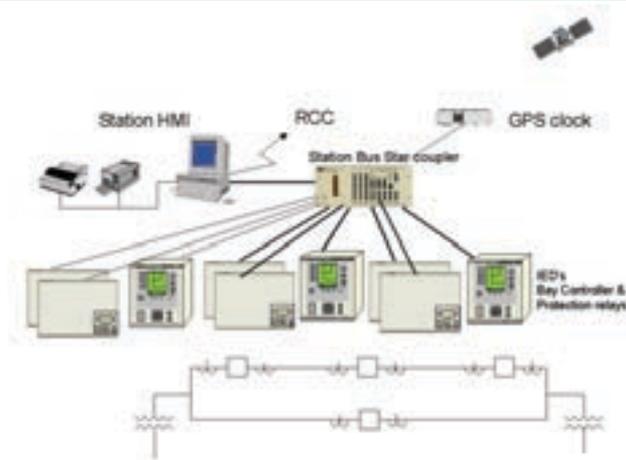


Figure 2. The structure of a typical substation automation system with substation control SCS and a remote gateway to Regional Control Centre (RCC)

The homogeneous SA system concept is based on achieving a very high reliability due to the decentralized solution and homogeneous IED and database structure. Different bays are independent and communicate to the Station HMI system and to the remote control at the Regional Control Centre (RCC) through the Station bus and a communication Gateway.

Security is achieved since equipment failure will never be allowed to cause loss of more than the defective device and the key components of the communication of the Station bus, are provided with duplicated auxiliary power supplies and independent interface cards for three nodes each (normally these nodes are modules from the same bay).

In this way a high reliability and availability is achieved without duplication of components. Reliability can be improved even further by the introduction of an emergency control of essential apparatus through the protection terminals using integral bay control and display capabilities.

A high flexibility for future expansion is achieved as the system is open for the addition of new and different types of existing modules depending on the need. It also allows for different levels of redundancy as required due to voltage level, station size and location.

Station Bus

The fast Station bus of the system (Fig. 2) utilizes a plastic or glass fiber-optic physical medium using industry standard secure connectors although plastic fibers can be used when distances and configuration requirement permit. Each bay unit (control or protection) has its own optical node within a star configuration. The star configuration has been selected to allow supervision of each individual node.

The new standard IEC 61850-9-1 is an open bus based on MMS over Ethernet and includes important functions such as peer-to-peer communication and transfer of time stamped messages. Speeds of 10 or 100 MBit/s can be realized today with 1GBit/s or greater capabilities anticipated in the future.

The existing LON bus has a transfer rate of 1.25 MBit/s. The maximum application-to-application transmission time for selected high-priority signals is less than 50 ms for units with LON interface. Hence, the time-critical signals for station interlocking can be sent across this bus. The security is further increased with a software reservation principle enabling real-time capabilities.

The star coupler in LON solution can be equipped with up to 25 fiber-optical ports with any combination of glass fibers, plastic fibers and electrical signals.

Time Synchronizing

Time synchronizing is an important part of a modern substation automation system. All occurring signals are time stamped on the lowest level when the signal occurs and the signals are sent with a "time-stamp" through the system. Synchronizing is provided using a GPS (Global positioning system) clock which sends signals to all connected IED's through the communication bus and as a result only one time-signal connection to the system is required, realizing considerable installation cost savings. The software time synchronizing uses an advanced algorithm to adjust the clock so that accuracy is maintained independent of station bus loading.

Redundancy Concept

The decentralized solution can use single or redundant bay controllers and bay protection giving a high level of independence and reliability. The bay modules communicate via the star coupler in a star configuration preventing any potential problems in one bay from affecting other bays.

To enhance availability the Station bus and network switch is provided with redundant AC/DC auxiliary supplies, although DC is preferred. It also contains two or three channels per board, for redundancy on the card levels. Consequently an extremely high level of availability is achieved without duplication on bay level or duplicated communication channels.

The link to the Regional Control Center (RCC) is normally configured to be independent of the local operator's workplace, although integrated alternatives can be supplied when required. The Station bus and the Protection and Control terminals supports a "multi-master" configuration and can therefore be connected to both the SA server and the RCC server. The SA & RCC servers are identical types of PC and provide a protocol converter for remote protocol support, typically normally IEC 870-5-101/4 or DNP3.0. The control and protection modules forming part of this SA system can handle three different masters in the system and redundancy can be achieved between Station and SCADA control and also within one of the two if required.

The total redundancy concept must be considered on case by case basis. In general today, most stations are unmanned and therefore a station computer with HMI and a separate Gateway computer is suitable. From the station computer a separate channel to the Regional Control Center (RCC) or National Control Centre (NCC) can be arranged either as a full gateway and/or as a LAN connection enabling control and monitoring with normal web-browsers and WAP telephones.

A Final Solution for Maximum Availability is Shown in Figure 3.

The bays include redundant protection and control modules. Each subsystem has an independent station bus with redundant supply and RCC control and station control is done through a fully independent system. To further increase availability from the RCC the Gateway communications software can also be included in the Station HMI computer. The system gives a maintenance free protection system as the operation of the protection terminals is supervised continuously by the RCC and station control system as an addition to the built-in self-supervision system in the numerical terminals.

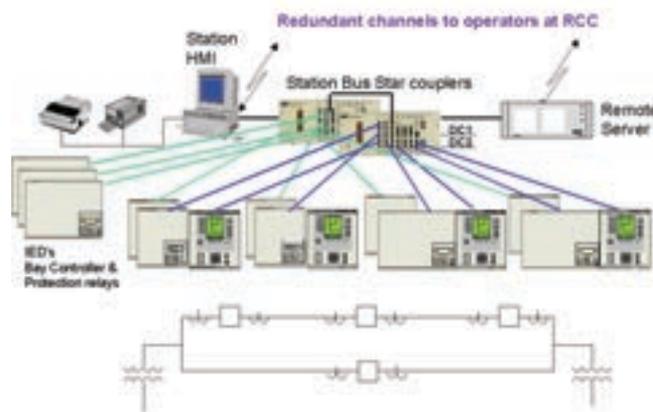


Figure 3. The final concept for maximum availability and minimum maintenance demand.

Human Machine Interface

The station Human Machine interface is normally available from a local level at the controller IED and at a central station level from the station computer.

Selection of operators place always includes a priority where the local level has higher priority than the station central level and the station level has higher priority than the SCADA level.

The station control level is from the station computer monitor. The computer and the monitor should always be supplied from the station dc supply (battery) to avoid extra equipment e.g. UPS systems. This provides high availability for station control even with a fault on the applied network.

Apparatus Control

The operator can control the various objects in the substation displayed on the single-line diagram (see Figure 4) such as Circuit Breakers (CB), Disconnectors (DS), Grounding switches (ES), transformer tap changers (TC), and modify set-points, etc. via a command picture (opened in Figure 4), which appears upon selection of the particular object on the single-line diagram. The operation of apparatus is performed in two steps. First the mode of operation i. e. OPEN/ CLOSE is chosen and the selected apparatus

will indicate it is selected for operation by changing color to white in the single-line diagram. In second step the operation is carried out by clicking on the EXECUTE key, i.e. the pre-selected command is then executed in the corresponding bay control unit.

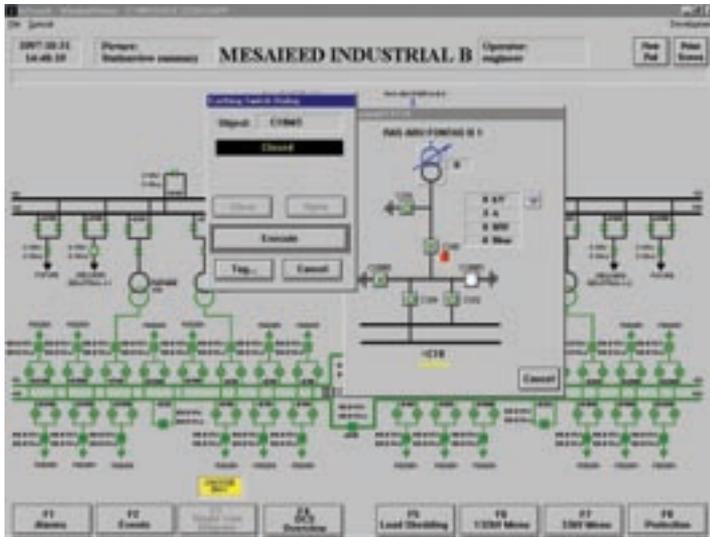


Figure 4. The single line diagram with a bay control. Grounding switch is selected for operation.

When an apparatus is selected for operation the selected information will be given to other apparatus preventing operation of several apparatus at the same time. In the bay controller it is then checked for interlocking conditions permission before execution of the command. Furthermore, the existence of blocking conditions e.g. low SF6 gas-pressure, are checked for the switching device (and in the case of circuit breakers also the Synchro-check verification). After successful termination of these checks the switching command is issued to the switching device using different control principles depending on the process requirements e. g. single or double command principle and single or double pole breaking.

Interlocking

The bay interlocking as well as the station-wide interlocking is performed using Boolean expressions implemented in the individual bay control units via an IEC1131 GUI configuration program. The station-wide interlocking expression requires switch position indications from other bays (e.g. busbar grounding switches, bus tie, bus coupler) are transferred to the corresponding bay control unit via the Station bus. A fail safe system requiring positive information from the bays to allow operation is used. The reliability will thus be very high and the speed requirement is kept down.

Scada Communication

The conventional SCADA communication through a hardware connected Remote Terminal Unit (RTU) is in this modern substation replaced with a communication gateway with full access to all data in the substation and with a remote communication protocol DNP3.0 or IEC 80-5-101/104 to the Regional Control Centre (RCC). Depending on the importance of the substation and the decided local control level different levels of redundancy can be utilized. Operators will have direct access to all values for control and operation but also information such as Disturbance recorder information (Oscillographs)

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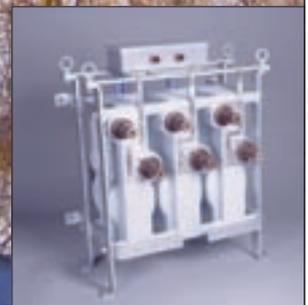
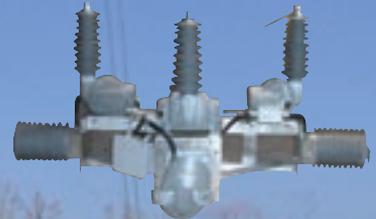
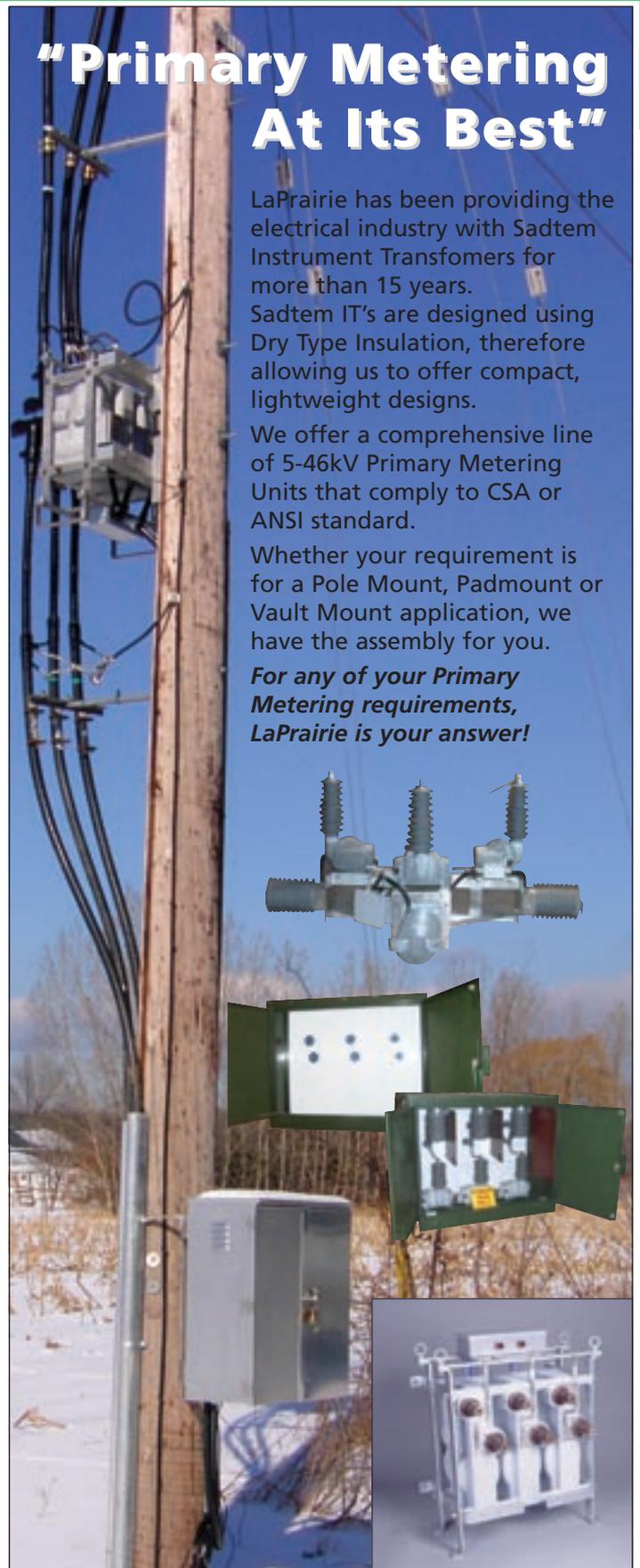
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Summary of Advantages

The main objectives when designing a homogeneous substation automation SA system are to provide an increased reliability and performance over conventional systems whilst also offering economical improvement both in actual and installed costs. Many of the benefits result in cost savings and increased reliability.

Horizontal Integration.

The integration of control, protection and monitoring in one common system (horizontal integration) offers a remarkable advantage in different aspects:

- The common man-machine interface (HMI) of control, protection and monitoring on station reduces the training costs and simplifies planning, operation, maintenance and outage management.
- Adaptive Relaying, the synergy of control and protection, opens significant new possibilities such as enabling increased load without compromising protection integrity.
- Special Protection Systems such as Remedial Action Schemes for implementation of advanced load and generation control schemes.

Optical Fibers

The use of optical fibers instead of copper wires offers considerable savings in number of wires (fibres), installation time (duration and cost) and provides increased interference barrier capabilities.

Data Access and Gateways

The Homogeneous SA solutions also provides easy "plug & produce" access to the rich IED device databases and easy access of all data at the RCC instead of limited selected IED data.

Self Supervision and Reliability

The modern IED's used in the substation have extensive self-supervision features. The conventional solution uses separate equipments by function and in most cases on an independent phase-by-phase measurement basis, and connected by hard-wiring between relays and equipment. This is inherently fully redundant but fails to provide the additional data and functionality of modern IED's. The high number of separate elements and discrete connections of the conventional solution gives potential failure points and to ensure that these equipment are fully available, extensive periodical maintenances is necessary. For the modern homogeneous substation as described, alarm and monitoring information is provided over the communications network and all IED's are supervised giving a considerable increase of reliability.

Reduced Maintenance Demands and Increased Availability

The modern protection and control equipment terminals include extensive self supervision features and are connected to the SA system via serial communication in a star configuration and any IED failure will be immediately identified by the communication server resulting in better maintenance and outage management. Maintenance intervals of at least 5-6 years can now be used with maintained reliability as well as cost savings and increased total availability. The use of fewer components also results in less training and maintenance.

Cables and Erection

The considerable savings in cabling due to the extensive use of optical fibres for all signals between the IED's and to the control and SCADA system, results in significant saving on cables, cable installation, testing, cable ducts, cables trays/ladders etc and result in shorter installation and erection times.

Commissioning

The commissioning includes signal verification for all signals. As the signals are software signals complete verification can be done on-line during the process of commissioning without extra signal verification to local control and SCADA system. The number wires to be verified is also drastically reduced as each signal is only brought into the control and protection system once.

Cost Benefits

The total installed and commissioned cost of relays is often many times the costs of the individual relay terminals or IED's and can be 7-10 times the individual IED costs. Using a modern homogeneous Substation Automation solution can reduce this total installed cost to 4-7 times the comparable individual IED costs through a reduction of cabling, erection and other costs.

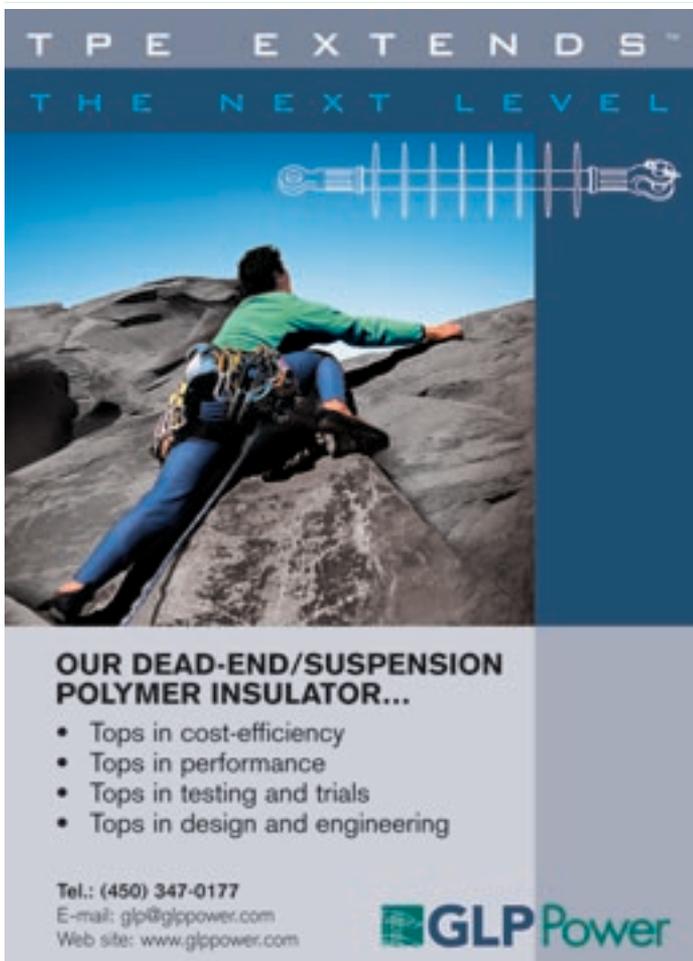
Modern Technology Benefits

Improved training and education of Personnel for maintenance and engineering through exposure and familiarity of modern technologies over traditional designs enabling the improved use and understanding of career building technologies and solutions. ■

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Graham Herriman is Business Unit Manager of ABB Inc., Protection and Communications, PTUA in Burlington, ON



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Virtual Temperature Increase to Account for Non-Adiabatic Heat Transfers in Short-Circuit Ratings Calculation



By: Pedro Cavaleiro
Co-responsible for the Engineering Department
Quintas & Quintas - Condutores Eléctricos S.A.

Abstract

The calculation of the short circuit capacity for the conductors and screens of power cables is based upon the popular adiabatic method. Disregarding heat transfer occurrence results in a conservative calculation, mainly for small sections such as those of the screen wires. To obtain a more realistic approximation we could virtually increase the maximum temperature used for the adiabatic calculation. In this paper we give an indication about such temperature increase both for conductors and metallic screens.

Introduction

Sophisticated software computations are available for the calculation of short-circuit ratings of both the conductor and metallic screen of virtually any power cable. However the basis for most of the short-circuit calculations is the international standard IEC 949. The method proposed by this standard takes into account the heat transfer through the adjacent materials of both conductor and metallic screen during a short-circuit situation— non-adiabatic heating.

Traditionally the short-circuit ratings are calculated on an adiabatic basis, assuming that all the heat generated is retained inside the metallic parts of the cable. This assumption provides a safety margin relatively to the non-adiabatic method.

Assuming an adiabatic process, all the heat generated by Joule effect in the metallic components of the cable determines that the maximum transient temperature is obtained through the following expression:

$$\theta_{Max} = \theta_{Op} + \frac{1}{C} \int R I_{Ad}^2 dt \quad (1)$$

being θ_{Op} the continuous operation temperature, C the heat capacity of the conductor and R its electrical resistance. The fault current I_{Ad} is provided for a transient time period τ .

The maximum allowed temperature is specified in order to avoid severe thermal stresses leading an accelerated ageing of the individual components of the cable. In the case of two of the most popular insulation materials: cross linked polyethylene (XLPE) and synthetic rubber (Ethylene Propylene Rubber, EPR), the maximum transient permissible temperature is 250 °C.

In order to account for heat transfer in the fault ratings for the conductors and metallic screens, the IEC 949 standard introduces an empirical factor ϵ , so that the relationship between the fault ratings obtained by the adiabatic (I_{Ad}) and non-adiabatic (I_{nAd}) methods is:

$$I_{nAd} = \epsilon I_{Ad} \quad (2)$$

The factor ϵ is specified for each of the metallic parts of the power cable, but in this work we will only concentrate on the conductor and metallic screen.

Conductor

Since the adiabatic rating is always more conservative than its non-adiabatic counterpart, we can assume in the first method a maximum temperature superior to recommended values determined by the insulation material, in order to obtain a short-circuit current identical to the one obtained by the non-adiabatic method. This would be of course a virtual increase in the maximum temperature, serving only for calculation purposes.

Therefore for aluminium conductors the virtual increase in the maximum temperature will be:

$$\Delta\theta = 318 \exp \left[0.137 \left(2.986 + \sqrt{\frac{a^2}{S} + \frac{b}{S}} \right) \right] - 478 \quad (3)$$

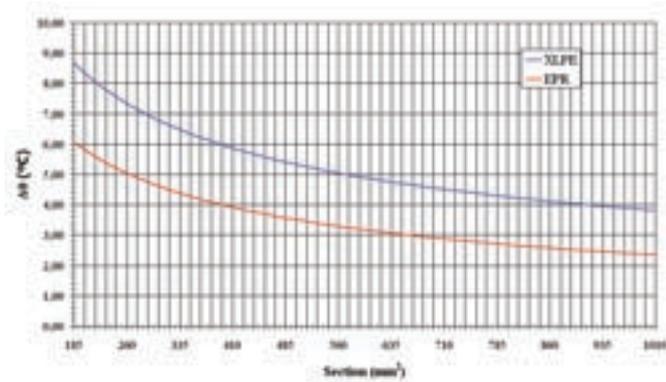
Where:

S: conductor cross-section;

a=1.702 mm; b=0.477 mm² for a XLPE insulation;

a=1.314 mm; b=0.298 mm² for a EPR insulation (>3 kV).

The value of such increase of temperature is depicted in Figure 1 as a function of the cross section of the aluminium conductor.



For a copper conductor the virtual increase of the maximum temperature would be:

$$\Delta\theta = 324.5 \exp \left[0.181 \left(2.218 + \sqrt{\frac{a^2}{S} + \frac{b}{S}} \right) \right] - 484.5 \quad (4)$$

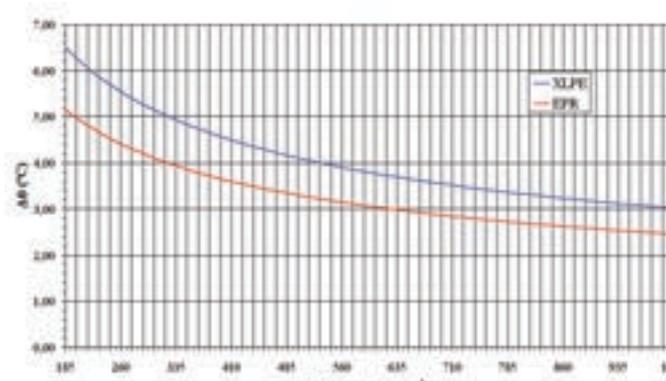
Where:

S: conductor cross-section;

a=0.909 mm; b=0.226 mm² for a XLPE insulation;

a=0.710 mm; b=0.155 mm² for a EPR insulation (>3 kV).

Figure 2 shows the behaviour of the virtual temperature increase as a function of the copper conductor cross-section.



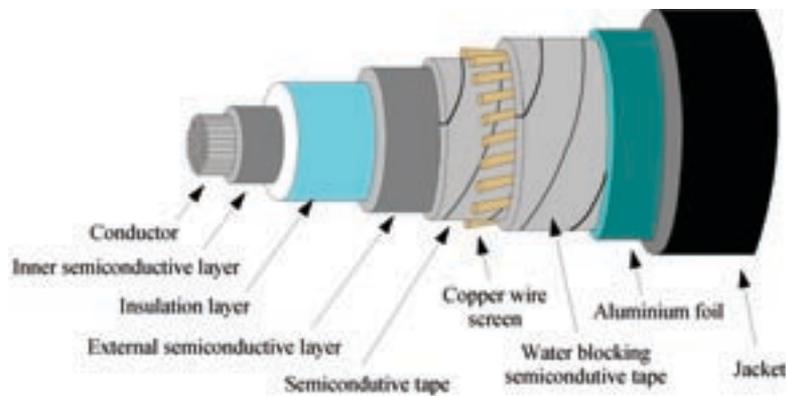
The fault current is now calculated through what we could call a modified adiabatic method:

$$\theta_{Max} + \Delta\theta = \theta_{Op} + \frac{1}{C} \int R I_{mAd}^2 dt \quad (5)$$

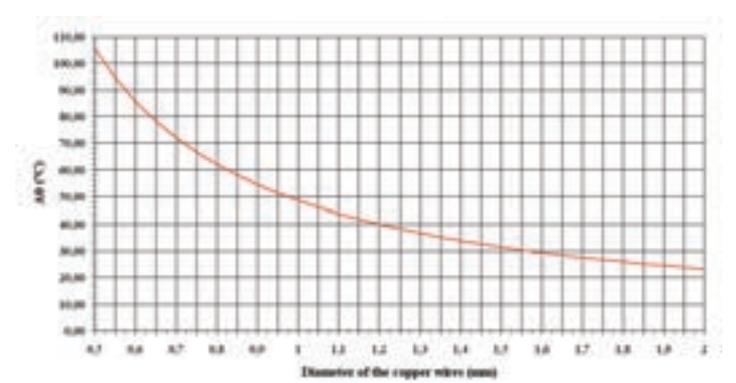
For both aluminium and copper conductors, the fault current rating obtained through the previous expression (I_{mAd}) is identical to its non-adiabatic counterpart (I_{nAd}) calculated according to the standard IEC 949. Assuming a transient of 1 second and a XLPE insulation, the maximum deviation for the conductor cross section range of Figures 1 and 2, is 2.14% for an aluminium conductor with a cross section of 185 mm², and 1.62% for a copper conductor with the same cross section.

Metallic screen

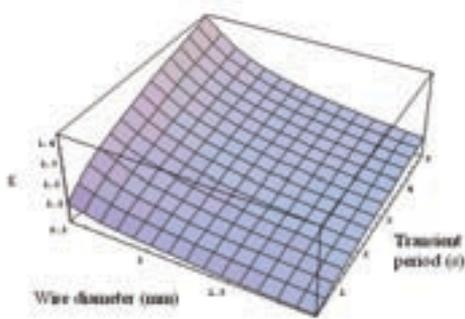
This metallic layer is applied over the semiconductive insulation screen, and acts in normal operation conditions as a return path for both capacitive charging currents and induced currents. In the event of an electrical fault such metallic screen can also carry short circuit currents. For illustration purposes we will consider a metallic screen made up of copper wires helically stranded over a XLPE semiconductive insulation layer. In order to avoid screen wire impressions due to heating, the copper wires are applied over screen bedding in the form of a semiconductive tape (Figure 3). To reinforce the moisture barrier and to ensure proper bedding, a semiconductive water blocking tape is applied over the copper wires.



By using the same method applied to the conductors, we can obtain the maximum virtual temperature that could be introduced into the adiabatic computations in order to take into account the heat transfer that occurs in reality. The expression obtained this way is far more tedious than the ones obtained for the conductors – expressions 4 and 5. Therefore we will only show the respective behaviour as a function of the diameter of the copper wires used in the metallic screen (Figure 4).



For a specific wire diameter we can calculate the non-adiabatic short-circuit current by using the above data on expression 5. The ratio factor ϵ depicted in Figure 5 as a function of the wire



diameter and short-circuit transient period, indicates a significant increase of the short-circuit current obtained by taking into account the heat transfers when compared with the adiabatic method. This is particularly notorious for the smallest wire diameters. If we consider a transient period of 1 second, the effective short-circuit current of a screen composed with copper wires with a diameter of 0.5 mm shows an increase of near 22% when compared with the value obtained by the adiabatic method. For a 2 mm wire the gap is reduced to 6%.

Conclusions

Following the principles announced on the international standard IEC 949, we propose a simplistic approach based on a virtual increase of the maximum transient temperature used in the traditional and more conservative adiabatic method. Such increase in the maximum temperature was defined by taking into account the heat transfers that occur in reality. This way the design engineer can obtain more reliable result out of the traditional adiabatic method, especially for the metallic components of the power cable with reduced cross section (namely the screen). ■

Figure captions:

- Figure 1.** Virtually imposed temperature increase for an aluminium conductor.
- Figure 2.** Virtually imposed temperature increase for a copper conductor.
- Figure 3.** A 60kV XLPE cable with a copper wire screen.
- Figure 4.** Virtually imposed temperature increase for a copper screen.
- Figure 5.** The ratio ϵ introduced by expression 2 as a function of the screen wire diameter and transient period.

Biography

Pedro Cavaleiro, received both his BSc degree in Physics and his MSc in Electrical Engineering from the Porto University (Portugal). He spent 6 years in a R&D institute, devoting most of his efforts in the field of electric current sensors for high voltage overhead lines. In 1999 he joined the Portuguese cable manufacturing group Quintas & Quintas, and he is currently co-responsible for the Engineering Department, where his experience is focused in the areas of product design, application and installation. He is author and co-author of several papers on electrical current sensors and cable design.

References

1. IEC standard 949, "Calculation of thermally permissible short-circuit currents, taking into account non-adiabatic heating effects".

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Billing, Blackouts, and the Obligation to Serve

By: Brian Owenson, Vice President – Solution Management, SPL WorldGroup

The search continues for a definitive “smoking gun” responsible for the Northeast’s blackout last year. Absent a clearly defined single cause, analysts turn to the “usual suspects”—issues the industry has been discussing for years. Is the grid large enough? Does it require additional investment? Given that the grid was never designed to handle a competitive industry, is it reasonable to require that it now do so?

At the core of these issues lies the obligation to serve. The grid is sized correctly when the industry can meet that obligation at the lowest reasonable cost.

Defining that obligation, then, is key to blackout prevention. But the electric industry and its policymakers—and the nation as a whole—have yet to reach consensus. Some seek to maintain the status quo. Others believe the obligation should be expanded to include emerging customer needs and niches. Some define the obligation as local. Others have a regional or national view.

A consensus definition of the obligation to serve may be long in coming. In the meantime, the public rightly demands that we focus on near-term blackout prevention. Doing so means acting in the face of uncertainty. But failure to act is not an option.

The Value of Demand Response

Given these circumstances, it makes sense to concentrate first on maximizing the efficiency of the existing grid. Demand response programs clearly fall into that category. While they require complex billing software, that investment is far smaller than are such grid-expansion remedies as more towers, more line, and more rights of way.

Demand response is an updated, flexible, and market-driven replacement for the interruptible rates that have long given grid managers to option to remove large customers from the grid on short notice. Utilities that use the demand response approach instead ask facilities to reduce load during a specific period and reward those that do with financial incentives geared to the length and size of the reduction. While not yet widespread, these programs have proven so valuable in solving some grid constraints that the Federal Energy Regulatory Commission (FERC) has become a strong advocate.

Demand response comes in two varieties.

- Reward programs. Utilities ask commercial and industrial customers if they might consider demand reductions at an indefinite time in the future. When a problem arises, utilities request a reduction in use from those signed up to participate. They reward those who implement reductions with a financial incentive geared to the problem’s size and duration.
- Price-based programs, in which customers determine in advance a set price at which they will reduce demand. This gives grid managers a clearer picture of likely demand as wholesale prices vary.

Within these basic types are dozens of variations. Utilities may place limits or guarantees on length of cutbacks. Customers may have different lengths of time in which to signal their participation. Some programs penalize customers who sign up but fail to participate over a defined period. Some utilities combine the two types of programs: customers specify a price at which they will consider a utility request to reduce demand.

Additional Complex

Historically, in their simplest form, customers’ energy charges have been calculated by multiplying the number of energy units used (typically expressed as a number of kilowatt-hours) by the price per unit. Using complex pricing, the energy charge is calculated by multiplying each interval by the price for that interval, then adding all of the results (products) together.

In practice, however, interval pricing is virtually never this simple. Two frequently used variations are peak-demand pricing and hedging.

Peak Demand Pricing

The ability to control peak demand does not provide utilities with the hour-by-hour control available via direct interval pricing. But it can be an effective tool in helping to prevent overloads or shortages.

Under peak-pricing programs, utilities grant customers an incentive (generally a price concession) to shift the timing of their peaks or to reduce their number and size. The agreement may be accompanied by such negative incentives as:

- Significantly higher prices for energy used during a utility’s peak periods.
- Additional charges for peak demand. In some markets, the rate per peak kilowatt can be two orders of magnitude greater than the equivalent non-peak energy.
- “Ratcheting.” This incentive requires customers who even once reach a specific high peak demand to pay a higher price for all energy used during a specific period, or for all energy used for a specific amount of time into the future. Typically, ratchets are calculated using timeframes of a year to two, but they can be longer. In some markets, ratchets are ongoing from the inception of the contract.

Billing Concepts

Peak-demand programs do not require interval data meters. Non-interval industrial meters commonly have simple peak-demand registers. However, coincidental peak demand is easily and accurately calculated from interval data meters with sufficiently small interval sizes, say 10-15 minutes.

Hedging

Hedges are financial instruments that insure against price volatility. Hedge sellers collect a fee in exchange for a guarantee to either:

- Deliver a specific amount of energy (the "hedge cover") to a specific place at a specific price (the "strike price") during a specific interval.
- Pay the difference between the energy price specified in the hedge (again, the "strike price") and the price the hedge buyer actually has to pay on the wholesale market for the amount of energy specified in the hedge (again, the "hedge cover").

In a market economy, hedge sellers set the energy price higher than they expect it to be during that interval. From a seller's point of view, the ideal hedge involves a customer who pays a fee and is never heard from again. As the time for delivery/payment nears, however, hedges are commonly resold at discounts or premiums that reflect changing market conditions.

Hedges help customers maintain a stable energy price. But only the largest buyers will want to handle them themselves. Some utilities offer and manage hedges. Others arrange them through a third party. In any event, their costs must be factored into the total cost of energy.

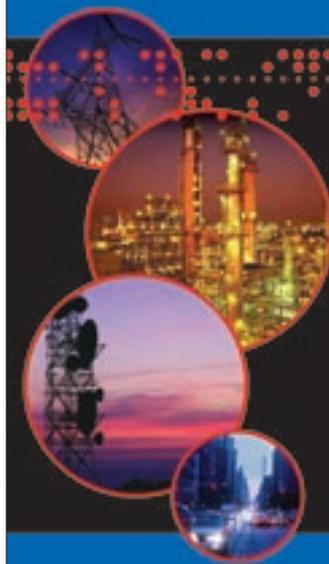
Brian Owenson is
Vice President – Solution Management
for SPL WorldGroup.

Demand response is a replacement for interruptible rates. And it arrives none too soon. Interruptible rates are increasingly unpopular with all parties. Utilities and regulators are often unhappy about price concessions in place for years in return for cooperation during emergency situations that rarely or never occur. At the same time, the manufacturers and distributors who have traditionally taken advantage of interruptible rates are finding them increasingly unworkable. High-tech and food-processing facilities, for instance, frequently have processes that, if interrupted, result

in the massive discarding of raw materials. Suppliers may be hit with penalties when a loss of electricity results in a failure to deliver to just-in-time customers.

Demand response solves these problems. Utilities pay incentives only when they're needed. And participants have options to determine the timing and extent of load reduction. It's a win-win approach to increasing grid efficiency and ensuring that utilities meet their obligation to serve.

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Software Infrastructure

Fundamental to effective demand response is complex billing software integrated into basic customer care and billing systems. Complex billing (also called “real-time,” “interval,” or “time-series” billing) uses special meters to measure consumption during a prescribed time interval—generally 10 to 60 minutes long for electricity.

In theory, a contract between a customer and a utility could specify different prices, terms, and conditions for each interval. In practice, most customers would find this unwieldy. Measuring consumption in half-hour intervals, for instance, could result in 1500 separate prices per month. Thus, under normal conditions, contracts group intervals into categories similar to the time-of-use categories that have long dominated industrial-customer ratemaking—peak, shoulder, and off-peak rates. With the more sophisticated processing possible with complex billing software, however, these categories are easily expanded to include, for instance, public holidays, traditionally slack periods in the customer’s industry, etc.

Contracts can be set up so that different prices, terms, and conditions apply to specific intervals during a crisis. And these contracts can be dynamically altered as required, given changing grid conditions. A customer signed up for demand response might agree to halve normal demand for a maximum of 12 hours and to pay a penalty for any interval above a specified limit. Toward the end of that period, the customer may agree to an extension, but at a different demand level, and for a different length of time. Utilities can peg the reward for participation to the length and severity of the crisis.

The Addition of Net Metering

Further grid efficiencies result from the addition of net metering options into a complex billing/demand-response program.

While national grid-connection standards have been slow to develop, many utilities have standing arrangements that take advantage of customers’ on-site generation during a crisis. Current arrangements, however, are frequently primitive. When, for instance, the amount of electricity injected is simply subtracted from that month’s consumption, customers may inject amounts that more closely reflect their own needs, not the utility’s.

Adding complex billing to net metering significantly increases their usefulness during high-demand periods. Utilities can, for instance, vary the incentive for injection with the severity of the crisis. They can raise incentives for facilities capable of injecting at key locations. And clear, short-term price incentives permit customers to evaluate whether they are better off using their generation on-site or selling it to the grid.

Additional Benefits

Building your software infrastructure to handle comfortably a variety of complex billing approaches has benefits beyond grid efficiency:

- Complex billing helps utilities address concerns about fairness. Small and mid-size commercial and industrial customers as well as regulators have long expressed discomfort with incentive programs limited to only the largest of industrial firms. But limiting the size of participants is necessary when incentive programs for grid injection or demand reduction must be calculated individually. Complex billing automates the calculation and the underlying contracts. That enables utilities to handle large numbers of program participants. It also enlarges the size of potential demand reductions.

□ The interval data routinely produced as part of the complex billing process has multiple uses. It can help facilities identify expensive and unnecessary peaks. It can indicate malfunctioning equipment and permit repairs in advance of breakdown. It can suggest conservation measures. To facilitate these uses, utilities may offer compilation services, such as delivering formatted data to customers on CDs. Utilities can also use the data to offer analytic services that increase facility efficiency while adding to the utility's bottom line.

□ Complex billing permits regulated utilities to offer direct access to wholesale electricity markets. Such programs may ease the concerns of large customers who advocate full retail competition as a way to provide themselves with lower-cost supply options.

Conclusion

There's no evidence that complex billing would have prevented the August blackout. In fact, there is no "magic bullet" that will prevent blackouts going forward. Minimizing the size and frequency of blackouts will likely result from dozens of steps taken by hundreds of utilities over the coming months and years.

Many of those steps will, like complex billing, improve grid efficiency. And identifying those efficiencies involves far more than back-room analyses of grid structure and load profile. Efficiencies will require innovative thinking and partnerships between utilities and their customers.

Complex billing underpins that thinking. It fosters commonsense innovations that, no matter what the future holds, maximize the effective use of current resources and thus hold down the cost of service. ■

About the Author

Brian Owenson is vice president for product strategy. Owenson is the author of Energy Data Management: Complex Billing and Pricing, available at: www.splwg.com/main/whitepaper/wpapply.asp.



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Transformer Oil Maintenance

By: Judie Rice, General Manager, A.F. White Ltd.



Transformer oil is a mineral based oil that is commonly used in transformers for its chemical properties and dielectric strength. This oil in your transformer acts as an insulator and a cooling agent. Over time, the oil will degrade resulting in the potential for faults and costly repairs. With a proper preventative maintenance program, you can avoid any costly down time and expensive repairs.

Oil Quality

The quality of your transformer oil will effect its insulation and cooling properties. Under normal operating conditions, a minimal breakdown of oil quality will occur from oxidization and contamination. These are summarized as follows:

- a) Oxidization is acid that forms in the oil when it comes in contact with oxygen. The acid will form sludge which settles on the windings of the transformer resulting in reduced heat dissipation. The windings will run hotter thereby creating more sludge which in turn will create even more heat. The high acid content and increased temperatures will accelerate the deterioration of the insulating qualities of the oil and if left untreated will cause the transformer to fail.
- b) Contamination commonly found in transformer oil includes water and particulate. The presence of either of these contaminants will reduce the insulating qualities of your transformer oil.

Testing

Testing your transformer oil should be part of your yearly preventative maintenance program. Testing the oil will help to determine when corrective measures are required. Initial testing will establish a base line for comparison and annual testing will plot any changes internally in your transformer.

The following 5 part test is a minimum requirement of an annual maintenance program:

- 1) Dielectric breakdown: Dielectric strength is a measure of voltage the oil will insulate against. Many contaminants conduct electricity better than oil therefore lowering the dielectric breakdown.
- 2) Neutralization/Acid Number: This test will measure the level of sludge causing acid present in the oil.
- 3) Interfacial tension: This test identifies the presence of polar compounds. These would indicate oxidation contaminants or deterioration from the transformer materials. i.e. paint, varnish, paper.

- 4) Colour: The colour of the oil indicates quality, aging and the presence of contaminants.
- 5) Water content: This tests for the amount of water present in the oil in parts per million. The presence of water in your oil will decrease the dielectric strength.

The Dissolved Gas Analysis (DGA) test is another useful tool as part of your maintenance program. Examining the gasses present in the oil can help determine if there are faults in the transformer including arcing, corona or overheated connections.

The results of the tests performed will help determine when further action is required. Predetermined limits for these tests must be set based on the voltage class and KVA of your transformer. Any tests performed showing results outside of the predetermined parameters indicate further investigation is required. A downward trend of your test results over time also warrants further testing and an evaluation of the results.

If remedial action is required for your transformer oil, a recent PCB analysis is required in addition to the preceding testing. If the result of the PCB testing is less than 2 ppm, in most cases an onsite reclamation of your oil can be performed. If the oil is over 2 ppm but less than 50 ppm, the oil can be shipped to a recycling facility and your transformer can be retrofilled with new or recycled oil. Any PCB analysis with results over 50 ppm will require special handling.

Remediation Treatment

If the quality of your oil has declined below acceptable levels a decision has to be made to replace or reclaim the existing oil. Often, the rapid degradation of the oil in your transformer indicates that remedial treatment is required for your transformer itself as well as the oil.

Reclamation of your existing oil can be performed onsite with limited down time. It is possible to restore your oil to new oil specifications with a combination of treatments including fuller's earth and degasification. If some contaminant levels are significantly high, it may be more economically practical to replace the oil rather than reclaim it.

A proactive approach should be taken if your transformer oil has a high acid content. Any sludge formed by the acid has to be rinsed out of the transformer with hot oil to remove the sediment. There is a cost saving to you if the oil is reclaimed in the early

stages of the acid build up, before the sludging occurs, as the oil will retain its quality longer under normal operating conditions.

Reclamation of oil with a high acid content includes fuller's earth treatment to remove acid and particulate, and degasification to remove gasses and water. This process will also correct the acid number and the colour.

Transformer oil can hold water particles in suspension depending on the temperature of the oil. If the oil is at its saturation point, there is likely to be free water at the bottom of the transformer. The dielectric strength of the oil is decreased with water present in the oil and a degasification of the oil is recommended. If the water content is particularly high, a hot oil dry out should be considered. Although more costly than a degasification, this will also remove any water that may be in the core and coil assembly.

If you have decided to replace the oil in the transformer, either new or recycled oil can be used. If the transformer tank is capable of vacuum, it should be filled under vacuum based on manufacturer's recommendations. If the tank cannot withstand a vacuum, the oil should be degasified into the transformer and circulated through the degasifier three times the volume of the transformer. This will help remove any moisture present in the insulation of the transformer.

New oil often requires further degasification to remove air and moisture added during the transportation and handling process. This will increase the life expectancy of the oil in the transformer.

Environmental Concerns

Mineral insulating oil is a valuable resource that can be recycled many times and returned to its original condition. Using new quality recycled oil or reclaiming your existing oil saves the depletion of a non-renewable resource and can be much more cost effective than replacing with new oil.

A preventative maintenance program for your transformer has both economic and environmental benefits. A failure of a transformer can result in significant environmental clean up costs and considerable replacement or repair costs. ■

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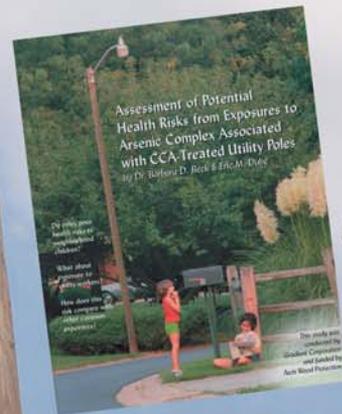
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Tel.: 720-220-6213 / Fax: 303-744-2108
Web: www.boreasgroup.us
E-Mail: rsarfi@boreasgroup.us
Robert Sarfi

BP GLOBAL SPECIAL PRODUCTS

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Tel.: (281) 480-7955 / Fax: (281) 480-8225
Web: www.bgusa.com
E-Mail: main@bgusa.com
Trent T.Gathright

BRIDGES ELECTRIC, INC.

P. O. Box 1197 Heber
Springs, AR U.S.A 72543
Tel.: (501) 362-8296 / Fax: (501) 362-6970
Web: bridgeselectric.com
E-Mail: jpuckett@bridgeselectric.com
Jeff Puckett

BRONTO SKYLIFT

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Tel.: (352) 895-1109
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102 American Road
Morris Plains, NJ U.S.A 07950
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Web: www.btechinc.com
E-Mail: sales@btechinc.com
Jim Reed

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3776 West Broadway
Minneapolis, MN U.S.A 55330
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Web: burmesiter-electric.com
E-Mail: martyk@burmeister-elec.com
Marty Koepke

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203 Commerce Avenue
Cambridge, WI U.S.A. 53523
Tel.: 608-423-3507 / Fax: 608-423-4618
Web: cmhydraulic.com
E-Mail: frank@cmhydraulic.com
Frank Weiss

C&D TECHNOLOGIES, INC

1400 Union Meeting Road
Blue Bell, PA US 19422
Tel.: 215.619.2700 / Fax: 215.619.7899
Web: www.cdtechno.com
E-Mail: swilliams@cdtechno.com
Sue Williams

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CANADIAN ELECTRICITY ASSOCIATION

1155 Metcalfe Street, Suite 1120
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Web: www.canelect.ca
E-Mail: info@canelect.ca
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13th Floor Ottawa, ON Canada K1A 0E4
Tel.: (613) 996-6119 / Web: www.nrncan.gc.ca
Web: www.small-hydro.com
E-Mail: tony.tung@nrncan.gc.ca
Tony Tung, Mgr

CARHARTT, INC.

5750 Mercury Drive
Dearborn, MI U.S.A. 48126
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Fax: (313) 271-6428
E-Mail: industrial_Sales@carhartt.com
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CCI

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Iron Mountain, MI US 49801
Tel.: (906) 774-6621 / Fax: (906) 774-9120
Web: www.cciinc.us
E-Mail: bruce.clark@cciinc.us
Bruce Clark

CCI CONTROLS

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South Gate, CA U.S.A. 90280
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Web: www.ccicontrols.com
E-Mail: mtksls@ccicontrols.com
Dan Mahaffie

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Woodstock, IL U.S.A. 60098
Tel.: (815) 334-1400 / Fax: (877) 779-4567
Web: www.celtictiger.com
E-Mail: info@celtictiger.com

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4345 Wood Drive
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Montreal, QC Canada H4A 2Y6
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Fax: (514) 228-8895
Web: www.m3isystems.com
E-Mail: timothy.edwards@cgi.com
Tim Edwards

CGI/CYME

3 Burlington Woods, 4th Floor
Burlington, MA U.S.A. 01803-4543
Tel.: (800) 361-3627 / Fax: (781) 229-2336
Web: www.cyme.com
E-Mail: info@cyme.com
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CHEMONITE COUNCIL

7510 Sierra Linda Ct.
Rancho Cucamonga, CA U.S.A. 91730
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CICAME ENERGIE INC.

2640 Blvd. Jacques-Cartier
Longueuil, QC Canada J4N 1P8
Tel.: (450) 679-7778 / Fax: (450) 679-9432
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6800 Cintas Blvd.
Mason, OH U.S.A. 45040
Tel.: (513) 754-3649 / (800) 541-7775
Fax: (513) 573-4232
Web: www.cintas-corp.com
E-Mail: mc Reynoldsn@cintas.com

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Gainesville, TX U.S.A. 76241
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Web: www.CBSales.com
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B. Schofield

CIRRONET INC.

5375 Oakbrook Parkway
Norcross, GA U.S.A. 30093
Tel.: (678) 684-2000 / Fax: (678) 684-2001
Web: www.cirronet.com
E-Mail: indust@cirronet.com
Tim Eskew

CITEL INC.

1515 NW 167th Street, Suite 5-223
Miami, FL U.S.A. 33169
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Web: www.citelprotection.com
E-Mail: citel@citelprotection.com
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Web: www.cleanharbors.com

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Burlingame, CA U.S.A. 94010
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Web: www.coen.com
E-Mail: wschuze@coen.com
Wes Schulze

COLT, POWER SERVICES DIVISION

P.O. Box 74396
Richmond, VA U.S.A. 23236
Tel.: 804-674-0031 / Fax: 804-674-1107
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E-Mail: jhackett@coltonline.com
Jim Hackett

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Florham Park, NJ U.S.A. 07932
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Fax: (204) 663-4854
Web: www.barkmanconcrete.com
E-Mail: wpgsales@barkmanconcrete.com

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145 Kingswood Rd., P.O. Box 247
Mankato, MN U.S.A. 56602
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Fax: (507) 387-1442
Web: www.condux.com
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Web: crgboilers.com
E-Mail: hweatherly@crgelectric.com
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506A Columbia Drive, Columbia, MO U.S.A. 65201
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E-Mail: dougw@critterguard.org
Doug Wulff

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Steve J. Iverson

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Web: www.energycentraljobs.com
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Corona, CA US 92882
Tel.: (909) 279-6684
E-Mail: alis@darnell.com
Ali Sotoudehnia

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2949 County Road 1000
East Dewey, IL U.S.A. 61840
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Web: www.dcbnet.com
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Web: www.datamatic.com
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Atlanta, GA U.S.A. 30341
Tel.: (770) 936-5600 / Fax: (770) 936-5614
Web: datamatx.com
E-Mail: hps@datamatx.com
Harry P. Stephens

DATEL INC.

11 Cabot Blvd.
Mansfield, MA U.S.A. 02048-1151
Tel.: (508) 339-3000 / (800) 233-2765
Fax: (508) 339-6356
Web: www.datel.com
E-Mail: sales@datel.com
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DATRIA SYSTEMS INC.

7211 South Peoria Street, Suite 260
Englewood, CO U.S.A. 80112
Tel.: (303) 728-1300 / (800) 583-9509
Fax: (303) 728-1301
Web: www.datria.com
E-Mail: info@datria.com

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Fax: (330) 673-0702
Web: www.davey.com
E-Mail: steve.marshall@davey.com

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Joe Farkus

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Web: www.deltastar.com
E-Mail: info@deltastar.com

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Minneapolis, MN U.S.A. 55441
Tel.: (763) 557-7440 / Fax: (763) 557-4700
Web: www.deltak.com
E-Mail: boilers@deltak.com

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4725 Highway 28 E.
Pineville, LA U.S.A. 71360
Tel.: (318) 448-0274 / Fax: (318) 445-7240
Web: www.distran.com
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Gahanna, OH U.S.A. 43230
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Web: www.disolutions.com
E-Mail: jking@disolutions.com

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E-Mail: info@driveproducts.com

DTE ENERGY TECHNOLOGIES

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Web: www.dtetech.com
E-Mail: srinivasn@dtetech.com

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102 Highway 212 P.O. Box 373
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Fax: (219) 872-9057
Web: www.dwyer-inst.com
E-Mail: lit@dwyer-inst.com
Mark Fisher, Dir. Sales & Mktg.

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E-Mail: tony.pink@dynamicratings.com

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E-Mail: jesteves@einstrumentsgroup.com
Jason Esteves

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E-Mail: sales@eosmfg.com
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Tel.: (414) 241-3845 / (800) 388-3268
Fax: (414) 241-5248
Web: www.eaglecmms.com
E-Mail: sales@eaglecmms.com

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Midland, VA U.S.A. 22728
Tel.: (540) 439-8911 / (800) 547-4045
Fax: (540) 439-1232
Web: www.easiset.com
E-Mail: easiset@mnsinc.com

EECOL ELECTRIC

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Calgary, AB Canada T2H 2L9
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Web: www.eecol.com
E-Mail: knorrllh@eecol.com

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Tel.: 773-262-3855 / Fax: 773-262-3988
Web: www.electroind.com
E-Mail: Rbogoff@electroind.com
Randy Bogoff

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Bridgeport, CT U.S.A. 06605
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David Goodfellow

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Web: www.electromark.com
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208 South Rogers Lane
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Web: www.elsterelectricity.com
Pat Corrigan, Customer Care Manager

ELVEX CORPORATION

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 Web: www.elvex.com/arc-shields.htm
 E-Mail: info@elvex.com
 Customer Service

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 Web: www.emprise-usa.com
 E-Mail: dsyck@emprise-usa.com
 David Syck

EMSPEC - ELECTRO MECHANICAL SYSTEMS INC.

1905 Boul. Lionel-Bertrand
 Boisbriand, QC Canada J7H 1N8
 Tel.: (450) 430-5522 / Fax: (450) 430-7067
 Web: www.emspec.com
 Daniel Mongrain, Président

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5125, J.A. Bombardier Street
 St-Hubert, QC Canada J3Z 1G4
 Tel.: (450) 444-2420 / (800) 724-2919
 Fax: (450) 444-4644
 Web: www.enerfin-inc.com
 E-Mail: sales@enerfin-inc.ca
 Sylvain Gelin, Sales & Mktg. Manager

ENERGIZER CANADA

6733 Mississauga Rd., Suite 700
 Mississauga, ON Canada L5N 6J7
 Tel.: (905) 286-6132 / Fax: (905) 286-6194
 Web: www.energizer.com
 E-Mail: jim.florence@energizer.com

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22 Julies Walk Halifax,
 NS, Canada Canada B3M 2Z7
 Tel.: (902) 445-4433 / Fax: (902) 457-3283
 Web: www.enerscanengineering.com
 E-Mail: info@enerscanengineering.com

ENERTECH CONSULTANTS

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 E-Mail: etcsales@enertech.net

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 Cambridge, ON Canada N1R 5S9
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ENNOVASION GROUP

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 Rochester, NY U.S.A. 14625
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 Larry Simpson

ENOSERV LLC.

5630 S. Memorial, Suite 100
 Tulsa, OK U.S.A. 74145
 Tel.: (918) 622-4530 / Fax: (918) 622-6569
 Web: www.enoserv.com
 E-Mail: sales@enoserv.com

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 London England EC1V 2PY
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 E-Mail: garrym@entech.us
 Garry Martin

ENVIRONMETRICS

Canada
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 Web: www.environmentrics.net
 E-Mail: lab@environmentrics.net
 Keith Earhart

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 Southampton, PA U.S.A. 18966
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 Fax: (215) 364-7582
 Web: www.ergonomicsusa.com
 E-Mail: info@ergonomicsusa.com

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 Central Point, OR U.S.A. 97502
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 Fax: (541) 664-9469
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 Web: www.erico.com
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 Web: www.ertelalsop.com

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 Fairburn, GA U.S.A. 30213
 Tel.: (770) 964-3322
 Web: www.estexmfg.com
 E-Mail: sales.ee@estexmfg.com
 Jim Wilkes

EUTILIA N.V.

Prof. Bargelaan 14 Leiden, -
 Netherlands 2333CT
 Tel.: +31 71 5353157
 Web: www.eutilia.com
 E-Mail: pieter.vaessen@eutilia.com
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199 Highway 206, Flanders, NJ U.S.A. 07836
 Tel.: (973) 448-0077 / (888) 332-EVIT(3848)
 Fax: (973) 448-0044
 E-Mail: info@everestvit.com

EVERSE CORPORATION

4751 Wilshire Blvd., 2nd Floor
 Los Angeles, CA U.S.A. 90010
 Tel.: 323-937-7713
 Web: www.everse.com
 E-Mail: andrewk@everse.com
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 Manchester, NH U.S.A. 03109
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 Web: www.federalpacific.com
 E-Mail: adver@federalpacific.com

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 University Park, IL U.S.A. 60466
 Tel.: (708) 534-4756 / (800) 548-7229
 Fax: (708) 534-4852
 Web: www.federal-signal-indust.com

FILNOR INC.

227 North Freedom Avenue
 Alliance, OH U.S.A. 44601
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 Web: www.filnor.com
 E-Mail: filnor@filnor.com
 Jim Neely

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FILTERVAC INTERNATIONAL INC.

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Breslau, ON Canada N0B 1M0
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Fax: (519) 648-2230
Web: www.filtervac.com
E-Mail: filtervac@kw.igs.net

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Tel.: (416) 745-9389 / Fax: (416) 745-0782
Web: www.firwin.com
E-Mail: pherman@firwin.com
Paul Herman, Pres.
See ad on page: 111

FISHEL CO.

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Louisville, KY U.S. 40218
Tel.: (502)456-2900
Web: fishelco.com
E-Mail: kbthompson@fishelco.com
Ken Thompson

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Web: www.fiso.com
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Web: www.flex-core.com
E-Mail: flexcore@msn.com
Don Morlan

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5230 South Service Rd. #125
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Web: www.flir.com
E-Mail: ircanada@flir.com
See ads on page: 93 - 110

FORTUNE ELECTRIC CO. LTD

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Web: www.memtronik.com
E-Mail: e.morales@memtronik.com
Emilio Morales

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5450 Old Spanish Trail
Houston, TX U.S.A. 77023
Tel.: (713) 428-5280 / Fax: (713) 921-4604
Web: www.merichem.com

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Web: www.metersmart.com
E-Mail: sales@metersmart.com
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E-Mail: sales@metrotech.com

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213 Sterling Road
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E-Mail: sales@moloney-electric.com

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E-Mail: jhartwick@mse-ta.com
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Tel.: (518) 452-7718 Ext. 130
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E-Mail: rick.vascotto@nexans.com

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2415-3rd. St., Ste. 271
San Francisco, CA, CA U.S.A. 94107
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E-Mail: randy@nextenergycorp.com
Randy Kauffman

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E-Mail: liz@northeastwire.com
Elizabeth Barker

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E-Mail: info@pauwels.com
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E-Mail: pbp-preissinger@t-online.de

PDO

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E-Mail: Walja70@yahoo.com
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E-Mail: info@pennseparator.com
Steve McNeil, President

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E-Mail: joannehoffman@pennsummit.com
Joanne Hoffman
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Tony Cutillo

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- R -

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313-B North Highway 11
West Union, SC U.S.A. 29696
Tel.: (864) 638-4812 / Fax: (864) 638-4950
Web: www.slb.com/utilities/

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Schöntaler Weg 47
Neuenrade, NRW German 58509
Tel.: +49 2392 692 26 / Fax: +49 2392 692 11
Web: www.schniewindt.de
E-Mail: michel.giraud@schniewindt.de
Dr. Michel Giraud

**SCHWEITZER
ENGINEERING LABORATORIES INC.**

2350 N.E. Hopkins Court
Pullman, WA U.S.A. 99163-5603
Tel.: (509) 332-1890 / Fax: (509) 332-7990
Web: www.selinc.com
E-Mail: info@selinc.com
See ad on page: 133

SEDIVER NORTH-AMERICA

2905 Louis Amos, Montreal, QC Canada H8T 1C3
Tel.: (514) 631-6060 / Fax: (514) 631-0577
E-Mail: sediver@qc.aira.com

SENSORLINK CORP.

1975 Valley Highway #9, P.O. Box 301
Acme, VA U.S.A. 98220
Tel.: (360) 595-1000 / Fax: (360) 595-1001
Web: www.sensorlink.com
E-Mail: info@sensorlink.com

SEVERN TRENT SYSTEMS

20405 State Highway 249, Suite 249
Houston, TX U.S.A. 77070
Tel.: (281) 290-1713 / (800) 231-4611
Fax: (281) 231-4611
Web: www.sts.co.uk
E-Mail: malcom.shakespeare@st-systems.com
Malcom Shakespeare Dir. Cis Operations

SHERMAN & REILLY INC.

400 W. 33rd Street
Chattanooga, TN U.S.A. 37410
Tel.: (423) 756-5300 / (800) 251-7780
Fax: (423) 756-2948
Web: www.sherman-reilly.com
E-Mail: sales@sherman-reilly.com

**SIEMENS POWER TRANSMISSION &
DISTRIBUTION, INC.**

4700 Falls of Neuse Road, Suite 200
Raleigh, NC U.S.A. 27609
Tel.: (919) 325-7044 / Fax: (919) 325-7057
Web: www.ptd.siemens.com
Rita Simonetta Sr. Mgr., Communications

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Housotn, TX U.S.A. 77057-4804
Tel.: (713) 626-9184 / Fax: (713) 626-0186
Web: www.softsmiths.com
E-Mail: hstappers@softsmiths.com
Hugo Stappers

SOFTSWITCHING TECHNOLOGIES

8155 Forsythia St., Middleton, WI U.S.A. 53562
Tel.: (608) 662-7200 / (800) 226-5028
Fax: (608) 662-7300
Web: www.softswitch.com

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Fax: (256) 751-5100
Web: www.bakearreels.com
Mike Harris, Recycling Mgr.

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Alpharetta, GA U.S.A. 30004
Tel.: (770) 619-5545 / Fax: (770) 619-5282
Web: www.srimap.com
E-Mail: tommym@srmap.com
Tommy Maloney

SOUTHERN STATES, LLC.

30 Georgia Avenue
Hampton, GA U.S.A. 30228
Tel.: (770) 946-4562 / Fax: (770) 946-8106
Web: www.southernstatesllc.com
E-Mail: sales@southernstatesllc.com

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(SUSI)**

5660 Broxton Circle
Norcross, GA U.S.A. 30092
Tel.: (770) 448-6810 / Fax: (770) 448-7260
Web: www.SouthernUtility.com
E-Mail: Chris@SouthernUtility.com
Chris Matthews

**SOUTHWEST MICROWAVE, INC.
SECURITY SYSTEMS DIVISION**

9055 S. McKemy, Tempe, AZ U.S.A. 85284
Tel.: (480) 783-0201 / (800) 587-5995
Fax: (480) 783-0401
Web: www.southwestmicrowave.com
E-Mail: tomw@southwestmicrowave.com
Tom Wallace, Sales Manager
See ads on page: 96 - 139

SOUTHWIRE COMPANY

One Southwire Drive
Carrollton, GA U.S.A. 30119
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Fax: (770) 838-6052
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P.O. Box 581 Brookfield, WI U.S.A. 58008
Tel.: (262) 784-8701 / Fax: (262) 784-8703
Web: www.spdsystems.com
E-Mail: bill@spdsystems.com
Bill Barry

SRC

650 N Broadview Place
Springfield, MO U.S.A. 65802
Tel.: (417) 864-0649
E-Mail: sshadwick@srcreman.com
Steve Shadwick

STERLING TRUCKS

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Tel.: (440) 269-5519
Web: www.sterlingtrucks.com
E-mail: tompeifer@sterlingtrucks.com
Marketing Communications Manager
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N56 W16665 Ridgewood Drive
Menomonee Falls, WI U.S.A. 53051
Tel.: (262) 703-5800 / (800) 554-2243
Fax: (262) 703-3073
Web: www.sbsbattery.com
E-Mail: maxm@sbsbattery.com
Max Mueller Ext: 3033

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Tel.: (607) 277-4968 / Fax: (607) 277-1193
Web: www.he-machinery.com
E-Mail: joe.walker@storkhe.com
Joe Walker

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Englewood, CO U.S.A. 80112
Tel.: (303) 799-0990 / (800) 424-9757
Fax: (303) 397-7595
Web: www.stratosglobal.com
E-Mail: vsat.sales@stratosglobal.com Or
david.christenson@stratosglobal.com
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Tel.: (262)784-7100 / Fax: (262)784-9561
E-mail: grada@superproductscorp.com

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450 Duane Avenue
Schenectady, NY U.S.A. 12304
Tel.: (518) 346-1414 / Fax: (518) 346-6080
Web: www.igc-superpower.com
E-Mail: tlehner@igc.com
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St-Julie d'Orford, QC Canada J0B 2S0
Tel.: (819) 821-3636 / (800) 663-0050
Fax: (819) 563-7517 • Web: www.surplec.com
E-Mail: surplec@surplec.com

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Tel.: (888) 868-5214 / Fax: (888) 500-5568
Web: www.synertechproducts.com
E-Mail: michael.pons@oldcastleprecast.com



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Fax: (605) 534-3861 • Web: www.t-r.com
E-Mail: t-r@t-r.com
John Bunkers Sls Mgr
See ad on page: 155

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100-2955 Virtual Way
Vancouver, BC Canada V5M 4X6
Tel.: (604) 299-0458 / Fax: (604) 451-4111
Web: www.tantalus.com

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Tel.: (949) 852-1972 / (800) 569-4736
Fax: (949) 852-1948
Web: www.tccomm.com
E-Mail: sales@tccomm.com
Nick Lee or Dean Maravilla, Tech. Sales

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Web: www.tdwilliamson.com

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9941 West Emerald Street
Boise, ID U.S.A. 83704
Tel.: (208) 658-1292 / Fax: (208) 323-5575
Web: www.telemetric.net
Scott Schoenherr, Sales Mgr.

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Watertown, SD U.S.A. 57201
Tel.: (605) 882-4000 / Fax: (605) 882-5533
Web: www.telelect.com
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Tigard, OR U.S.A. 97223
Tel.: (800) 248-8737 / Fax: (503) 924-1549
Web: www.terexutilities.com
Bill Harrington, VP Operations

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E-Mail: dhebert@termaco.com

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Web: www.reefindustries.com
E-Mail: ri@reefindustries.com
Jeff Henderson

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125 Traders Blvd. E., Unit 2
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Tel.: (905) 501-1888 / (888) 950-8889
Fax: (905) 501-0226
Web: www.testcor.com
E-Mail: dlloyd@testcor.com
David Lloyd, President

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E-Mail: conveyordocor@earthlink.net
Larry R. Engle

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Web: www.voncorp.com
E-Mail: voncorp@voncorp.com
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Ravenna, OH U.S.A. 44266
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Web: www.whitesafetyline.com
Mark Filing, Sales Manager

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Web: www.padlocks.com
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Nancy Walters

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Web: www.hamon-thermaltransfer.com
E-Mail: Terry.King@hamonusa.com
Terry King

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E-Mail: mail@tiiger.com

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Web: www.djinfo.com/TEDC
E-Mail: thiestedcca@aol.com

THOMAS & BETTS LIMITED

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St-Jean-sur-Richelieu, QC Canada J2X 2M9
Tel.: (450) 347-5318 / Fax: (450) 347-1976
Web: www.tnb-canada.com
E-Mail: mrkt_canada@tnb.com

THOMAS & BETTS LIMITED (Aluminum Structures Division)

1800 Hymus Boulevard
Dorval, QC Canada H9P 2N6
Tel.: (514) 685-2277 / (888) 687-1777
Fax: (514) 685-1840
Web: www.al-struct.com

THOMAS & BETTS LIMITED (Emergency Lighting Products)

1811 Hymus Boulevard
Dorval, QC Canada H9P 1J5
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Web: www.emergi-lite.com

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1800 Hymus Boulevard
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 Tel.: (888) 687-1777 Ext: 208
 Fax: (514) 685-1840
 Web: www.tnb-canada.com
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 Tel.: (254) 399-2100 / Fax: (254) 399-2651
 Web: www.timemfg.com
 E-Mail: renees@timemfg.com

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 Web: www.timemfg.com
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**TRANSAMERICAN
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2427 Kelly Lane, Houston, U.S.A. 77375
 Tel.: (281) 444-8277 / Fax: (281) 444-7270
 Web: www.tappinc.com
 E-Mail: amallik@tappinc.com
 Ajay Mallik

TRANS-CYCLE INDUSTRIES, INC.

455 Archer Drive, P.O. Box 518
 Kirkland Lake, ON Canada P2N 3J5
 Tel.: (705) 567-9997 / Fax: (705) 567-9979
 Web: www.tci-pcb.com
 E-Mail: tci.pattir@nt.net
 Peter Demeter, VP, Sales & Mktg.

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 Tel.: (416) 298-8108 / Fax: (416) 298-2209
 Web: www.trenchgroup.com
 E-Mail: tonyj@ca.trenchgroup.com
 Tony Jefferson
See ad on page: 131

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110 Amber Lake Drive
 Ball Ground, GA U.S.A. 30107
 Tel.: (770) 704-6623
 Web: www.tri-techenergyservices.com
 E-Mail: tri-tech@tri-techenergyservices.com
 Michael Brantley, P.E.

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 Shreveport, LA U.S.A. 71107
 Tel.: (318) 929-2368 / (800) 825-2402
 Fax: (318) 929-4853
 Web: www.tse-international.com
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 E-Mail: info@tvd.co.nz
 Andrew Thompson CEO
See ad on page: 24

TYNDALE COMPANY, INC.

5050 Applebutter Road
 Pipersville, PA U.S.A. 18947
 Tel.: (800) 356-3433 / Fax: (215) 766-5661
 Web: www.FRClothing.com
 E-Mail: sales@tyndale-co.com
 Kevin McLaughlin Director of Sales

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 Colin Riley

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 Web: www.unitedph.com
 E-Mail: croska@unitedph.com
 Chip Roska

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17845 Hwy 10
 Elk River, MN U.S.A. 55330
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 Web: www.usgweb.com
 E-Mail: jsetala@usgweb.com
 John D. Setala

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104 S Estes Drive, #204
 Chapel Hill, NC U.S.A. 27514
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 E-Mail: roberts@usatcorp.com
 Robert Stankavish

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 Fax: (610) 380-9433
 E-Mail: graphics@uticom.net
 Melinda Brown

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 Waukesha, WI U.S.A. 53186
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 Web: www.uelc.com
 E-Mail: rent@uelc.com

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 Web: www.UMScorp.com
 E-Mail: rwd@UMScorp.com
 Ron Daffin

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 Fax: (613) 225-1681
 Web: www.utilitystructures.com
 E-Mail: sales@utilitystructures.com

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 Web: www.vacudyne.com
 E-Mail: info@vacudyne.com
 Gleen Both, Sales Manager

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 Ontario, CA U.S.A. 91761
 Tel.: (909) 923-9390 / Fax: (909) 923-9391
 Web: www.vanguard-instruments.com

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 Colorado Springs, CO U.S.A. 80919
 Tel.: (719) 531-5855 / (800) 531-0180
 Fax: (719) 531-5690
 Web: www.velcon.com
 E-Mail: vfsales@velcon.com
 Contact: Ben Taylor

VIFAB A DIVISION OF VPK METAL INC.

2700 Cohen, St-Laurent, QC Canada H4R 2N6
 Tel.: (514) 338-1699 / Fax: (514) 338-1978

VIGILIX

200 North Main St., Suite 301
 Greenville, South Carolina U.S.A. 29601
 Tel.: (864) 421-9256 / Fax: (864) 421-9272
 Web: www.vigilix.com
 E-Mail: peggy.durham@vigilix.com

**VIMETAL / PECKOVER
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4700 Bois Franc
 St-Laurent, QC Canada H4S 1A7
 Tel.: (514) 337-0161 / Fax: (514) 745-2968
 E-Mail: vimetal@NetAxis.qc.ca

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Tel.: 416-690-8133 / Fax: 416-690-8233
E-Mail: greg@virelli.com
Greg Virelli

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Tel.: (262) 767-2100 / Fax: (262) 767-2119
Web: www.vista-start-smart.com
E-Mail: info@vista-start-smart.com

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Web: www.vitaledgepartners.com
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Fax: (517) 264-8246 • Web: www.wacker.com
E-Mail: customercare@wackersilicones.com

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Web: www.wagnersmithequipment.com
E-Mail: jwagner@wagnersmithequipment.com
James Wagner

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West Palm Beach, FL U.S.A. 33407
Tel.: (561) 712-1200 / Fax: (561) 712-9580
Web: www.walkabout-comp.com
E-Mail: info@walkabout-comp.com

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70 York St. 1100, Toronto, ON Canada M5J1S9
Tel.: 4169452013 • Web: www.wattsworth.com
E-Mail: alen.bebir@wattsworth.com
Alen Bebir

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E-Mail: wesinfo@waukeshaelectric.spx.com

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4011 Power Inn Rd, Sacramento, CA, U.S.A. 95826
Tel.: (916) 455-2284 / Fax: (916) 455-0191
Web: www.weidmann-acti.com
See ad on page: 122

WENZHOUIKUN ELECTRIC CO., LTD.

6/F, Merchandise Inspection Building W.S. Side
Chezhan Avenue, Wenzhou ,
China Wenzhou China 325000
Tel.: 86-577-88328598 / Fax: 86-577-88328578
Web: www.chinese-arrester.com
E-Mail: yikun@mail.wzptt.zj.cn
Dick Yu

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16900 Foltz Parkway, Cleveland, OH U.S.A. 44149
Tel.: (440) 238-2550 / (800) 557-0064
Fax: (440) 238-0660
Web: www.weschler.com
E-Mail: sales@weschler.com
Jerry Lucak, Sales Manager

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2845 West 48th Place
Chicago, IL U.S.A. 60632
Tel.: (773) 523-7000 / Fax: (773) 523-0965
Web: www.westexinc.com
See ad on the Inside Back Cover

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Rua Rui Barbosa 2062
Joinville, SC Brazil 89220-100
Tel.: + 55 47 4514210 / Fax: + 55 47 4735934
Web: www.wetzel.com.br
E-Mail: angelo@wetzel.com.br
Angelo Monteiro

WH SALISBURY
7520 North Long Avenue
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Web: www.whsalisbury.com
E-Mail: info@whsalisbury.com

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Pittsburgh, PA U.S.A. 15222-2292
Tel.: (412) 562-7300 / Fax: (412) 562-7254
Web: www.wapc.com
E-Mail: info@wapc.aquilex.com
K.A. Furst

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2600 Commerce Drive
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Tel.: (847) 918-3700 / Fax: (847) 918-3701
Web: www.FrickNET.com
E-Mail: Sherry.Weber@FrickNET.com
Sherry Weber

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Factoryville, PA U.S.A. 18419
Tel.: (570) 378-3808 / Fax: (570) 378-2597
Web: www.winolaindustrial.com
E-Mail: winola@epix.net
Jim McGlynn, G.M.
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Web: www.wireservices.ca
E-Mail: jekoop@wireservices.ca
Jim Koop
See ad on page: 114

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E-Mail: service@wylelabs.com



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- Transformers - Distribution, Padmounted
- Transformers - Distribution, Pole-Type
- Transformers - Distribution, Substation-Type
- Transformers - Distribution, Subsurface
- Transformers - Dry Out Systems
- Transformers - Field Repairs
- Transformers - Grounding
- Transformers - Instrument
- Transformers - Instrument, Current
- Transformers - Large Power
- Transformers - Large Power, 10,001 kVA and Larger
- Transformers - Maintenance
- Transformers - Maintenance/Repairs
- Transformers - Medium & Large Power
- Transformers - Mobile
- Transformers - Monitoring
- Transformers - Monitors
- Transformers - Network
- Transformers - Nonflammable Liquid-Filled
- Transformers - Oil Filled - Lead Cables
- Transformers - Painting and Flow Coating
- Transformers - Power
- Transformers - Protection
- Transformers - Rebuild
- Transformers - Rebuilding and Repair Services
- Transformers - Rental Services
- Transformers - Small Power
- Transformers - Small Power, 10,000 kVA and Smaller
- Transformers - Splitcore
- Transformers - Test Equipment
- Transformers - Used, Rebuilt
- Transformers - Voltage
- Transformers - Window Type
- Transformers
- Transmission - Underground
- Transmission and Distribution Line
- Trashracks
- Trashrakes
- Treating Services - Insulating Oil
- Treating Services - PCB Removal
- Treating Services - Poles, Crossarms
- Tree Trimming
- Tree Trimming Equipment
- Truck Mounted Air Compressors
- Trucks
- Trucks and Accessories - Manufacturers
- Trucks and Van Interior Equipment
- Tubing - Condenser Heat Exchange
- Tubing - Copper Alloy
- Turbine Oil Conditioners
- Turbines
- Turbines - Gas - Air Pre-Cool
- Turbines - Gas - Engine - Manufacturer
- Turbines - Steam - Component Repair
- Underground Construction Equipment
- Uniforms
- Uniforms - Flame Resistant, Breathable
- Uninterruptible Power Supplies
- UPS Systems and Supplies
- Utility Automation
- Vacuum Deshydration - Oil Purification Systems
- Vacuum, Industrial
- Valves - Ball
- Valves - Butterfly
- Valves - Check
- Valves - Drain
- Valves - Gate
- Valves - Globe
- Valves - Pressure Relief
- Valves - Sampler
- VAr Systems - Static
- Vaults - Utility
- Vaults, Underground - Concrete
- Vegetation Management
- Vehicles - Computer Mountings
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- Voltage Supplies
- Voltage Supplies - Regulated
- Voltmeters - Alternating Current
- Voltmeters - Differential
- Voltmeters - Digital
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- Voltmeters - Kilovolt
- W&C Accessories - Ties - Cable
- Water Treatment - Liquid/Solid Separation
- Wire - Guy
- Wire - Seals
- Wire and Cable Accessories
- Wire, Copper Grounding
- Wire, Steel Strand - Aluminum - Clad
- Wires and Cables - Electrical
- Wiring Devices and Systems
- Wood - Pole
- Wood Preservatives
- Wood Treatment



NFPA 70E means it's time for Workrite.

What is NFPA 70E?

Published by the National Fire Protection Association, NFPA 70E was written to protect electrical workers *in every industry* around any type of device capable of generating an arc flash.

While often lasting less than a second, the arc can reach temperatures exceeding that of the sun. The resulting energy can maim or kill anyone lacking appropriate flame-resistant apparel.

Who's affected?

It's hard to imagine an industry that *isn't* affected by NFPA 70E. Virtually any facility housing electrical equipment falls under its guidelines, especially in enterprises dependent upon heavy machinery operations.

And within each organization are maintenance workers, electricians, machine operators, or HVAC personnel that risk an electric arc flash around such equipment as meter banks, motor control centers and transformers. They must be protected in order to be compliant with NFPA 70E.

Why Workrite?

Flame-resistant apparel is crucial for compliance with the 70E standard. Durable, well-made apparel that won't ignite and continue to burn, enabling the best chance of escaping the unimaginable effects of an explosive arc.

Workrite® has led the flame-resistant apparel industry since 1973. We've developed a great deal of technical expertise regarding FR fabrics, garment construction and workplace safety standards. That's because FR is all we do.

We're in the forefront of helping companies with NFPA 70E compliance. From Hazard Risk Category 1 to 4, Workrite can help you develop the right FR program to meet 70E requirements.

Industry-leading quality

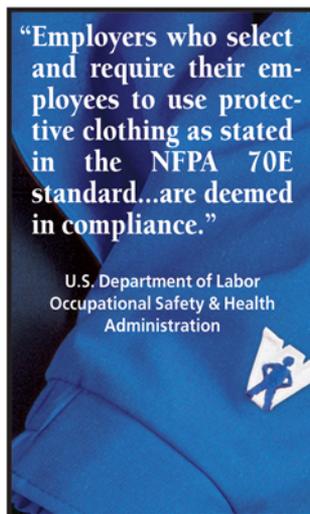
We use only proven top-quality materials, like Indura Ultra Soft®, a comfortable fabric that provides flame resistance guaranteed for the life of the garment.

We offer a "Made in the USA" line as well as cost-effective NAFTA work wear. And all Workrite garments feature unrivaled sewn-in quality for outstanding durability and value.

From pants and shirts to outerwear, our FR apparel meets the most stringent specifications. We are proud to be an ISO-9001 certified company, having achieved a "best practice" designation by our ISO certifying organization.

Contact us today to request our new NFPA 70E work wear compliance guide.

Welcome to flame-resistant leadership.



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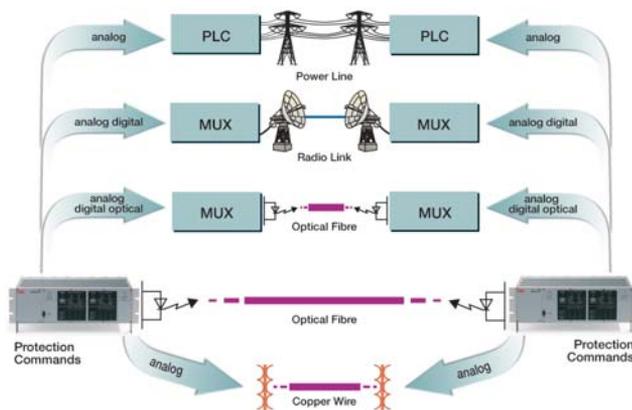
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3BEC4016033P0001

RES 521 Terminal for Synchronized Phasor Measurement



ABB's new RES 521 Phasor Measurement Terminal is a key component for gaining more efficiency out of your existing transmission lines and primary equipment. RES 521 phasor measurements are synchronized using GPS (Global Positioning Satellite system) to allow time tagging accuracy of one micro-second.

The RES 521 terminal provides you with:

High measurement accuracy

The ready-to-use RES 521 offers unrivaled measurement accuracy for estimating the precise power system state. It enables you to keep your assets constantly at optimum use.

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Quebec & Eastern Region: 10 300 Henri-Bourassa W., St-Laurent, QC
Tel: 514-832-6511, e-mail: jean-pierre.r.vien@ca.abb.com

Western Region: 9418 - 39th Ave., Edmonton, AB
Tel: 780-447-6538, e-mail: lawrence.p.broski@ca.abb.com

A MAJOR STEP TOWARDS WIDE AREA MONITORING

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Take a major step forward in increasing your power flow by optimizing your asset utilization with the help of the RES521 Phasor Measurement Terminal. For a total Wide Area Monitoring System (WAMS) also ask for ABB Inform^{IT} PS Guard.



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Web: www.southwestmicrowave.com
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ATCO NOISE MANAGEMENT

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TEREX UTILITIES RENTAL

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SOUTHWEST MICROWAVE, INC. SECURITY SYSTEMS DIVISION

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Web: www.weidmann-acti.com

See ad on page: 122

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ANALYZERS - PCB

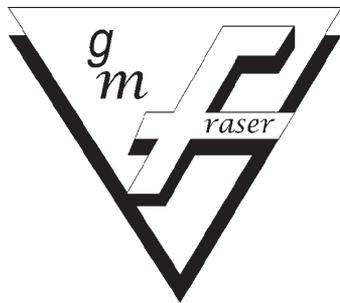
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Web: www.wagnersmithequipment.com

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Web: www.pennseparator.com

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BOILER - EMERGENCY SERVICES

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VOGT POWER INTERNATIONAL

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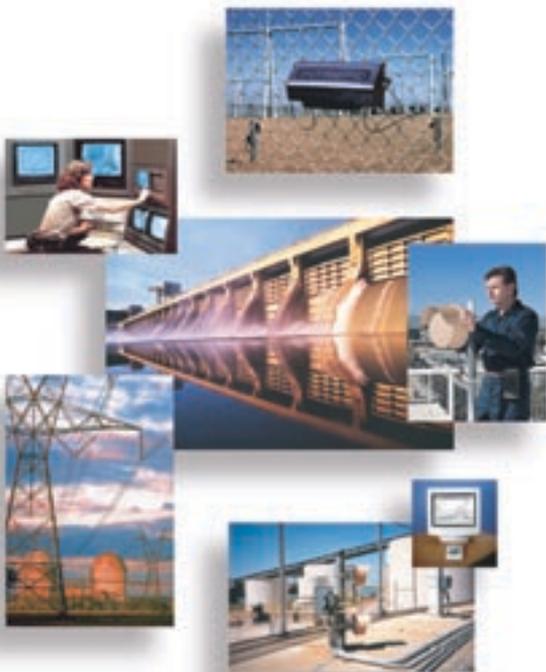
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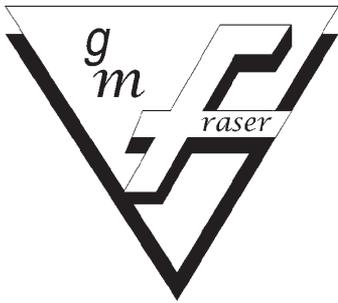
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MEGGER
 Tel: (214) 333-3201 • Web: www.megger.com
 See ad on page: 11

NDB TECHNOLOGIE INC.
 Tel: (418) 877-7701 • Web: www.ndb.qc.ca

THE VON CORPORATION
 Tel: (205) 788-2437 • Web: www.voncorp.com
 See ad on page: 12

DETECTORS - FAULT

HDW ELECTRONICS INC.
 Tel: (610) 861-8862
 Web: www.hdwelectronics.com
 See ad on page: 8

IFD CORPORATION
 Tel: (604) 734-0105
 Web: www.ifdcorporation.co

MEGGER
 Tel: (214) 333-3201 • Web: www.megger.com
 See ad on page: 11

MORGAN SCHAFFER SYSTEMS, INC.
 Tel: (514) 739-1967
 Web: www.morganschaffer.com
 See ads on page: 109 - 123

RADIODETECTION
 Tel: (201) 848-8070
 Web: www.radiodetection.com

SCHWEITZER ENGINEERING LABORATORIES INC.
 Tel: (509) 332-1890 • Web: www.selinc.com
 See ad on page: 133

THE VON CORPORATION
 Tel: (205) 788-2437 • Web: www.voncorp.com
 See ad on page: 12

DETECTORS - GAS

INDUSTRIAL SCIENTIFIC CORPORATION
 Tel: 905-727-6418 • Web: www.indsci.com

MORGAN SCHAFFER SYSTEMS, INC.
 Tel: (514) 739-1967
 Web: www.morganschaffer.com
 See ads on page: 109 - 123

DETECTORS - INFRARED

FLIR SYSTEMS LTD.
 Tel: (800) 613-0507 • Web: www.flir.com
 See ads on page: 93 - 110

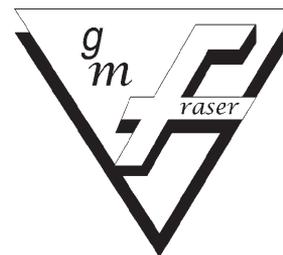
MIKRON INFRARED INC.
 Tel: (906) 487-6060
 Web: www.mikroninfrared.com
 See ad on page: 7

SOUTHWEST MICROWAVE, INC. SECURITY SYSTEMS DIVISION
 Tel: (480) 783-0201
 Web: www.southwestmicrowave.com
 See ads on page: 96 - 139

DETECTORS - LEAK

CCI CONTROLS
 Tel: (323) 560-6060 • Web: www.ccicontrols.com

DETECTORS - PARTIAL DISCHARGE



GEORGE M. FRASER LTD
 Tel: (450) 562-0771 • Web: www.gmfraser.com

DETECTORS - VOLTAGE



CICAME ENERGIE INC.
 Tel: (450) 679-7778

MEGGER
 Tel: (214) 333-3201 • Web: www.megger.com
 See ad on page: 11

DETECTORS - VOLTAGE
(Continued)

THIES ELECTRICAL DISTRIBUTING CO.
Tel: (519) 621-2524
Web: www.djinfo.com/TEDC

DIAGNOSTIC EQUIPMENT

DTE ENERGY TECHNOLOGIES
Tel: (248) 427-2243 • Web: www.dtetech.com

MORGAN SCHAFFER SYSTEMS, INC.
Tel: (514) 739-1967
Web: www.morganschaffer.com
See ads on page: 109 - 123

DIGGERS - DERRICKS

TEREX TELELECT
Tel: (605) 882-4000 • Web: www.telelect.com
See ad on page: 19



TEREX UTILITIES RENTAL
Tel: (800) 248-8737
Web: www.terexutilities.com

DIRECT LOAD CONTROL

REGENCY TECHNOLOGIES INC.
Tel: (317) 543-9740

DISPATCH SYSTEMS - COMPUTER-AIDED

TVD INC. "THE STABLES"
Tel: +64 9 376-6016 • Web: www.tvd.co.nz
See ad on page: 24

DISTRIBUTED CONTROL SYSTEMS

SCHWEITZER ENGINEERING LABORATORIES INC.
Tel: (509) 332-1890 • Web: www.selinc.com
See ad on page: 133

DISTRIBUTION AUTOMATION - COMMUNICATIONS

MICROWAVE DATA SYSTEMS, INC.
Tel: (585) 242-9600
Web: www.microwavedata.com
See ad on page: 53



RADIUS RADIO NETWORK TECHNOLOGY
Tel: (414) 427-7010 • Web: www.radius-us.com

SCHWEITZER ENGINEERING LABORATORIES INC.
Tel: (509) 332-1890 • Web: www.selinc.com
See ad on page: 133

STRATOS VSAT, INC.
Tel: (303) 799-0990
Web: www.stratosglobal.com
See ad on Divider #1 Verso

TC COMMUNICATIONS
Tel: (949) 852-1972 • Web: www.tccomm.com

TELEMETRIC
Tel: (208) 658-1292 • Web: www.telemetry.net

TVD INC. "THE STABLES"
Tel: +64 9 376-6016 • Web: www.tvd.co.nz
See ad on page: 24

DISTRIBUTION AUTOMATION SYSTEMS

KEMA INC.
Tel: (781) 273-5700 • Web: www.kemainc.com
See ad on the Inside Front Cover

MICROSOL
Tel: (203) 888 3002 • Web: www.microsol.com

SCHWEITZER ENGINEERING LABORATORIES INC.
Tel: (509) 332-1890 • Web: www.selinc.com
See ad on page: 133

STRATOS VSAT, INC.
Tel: (303) 799-0990
Web: www.stratosglobal.com
See ad on Divider #1 Verso

TVD INC. "THE STABLES"
Tel: +64 9 376-6016 • Web: www.tvd.co.nz
See ad on page: 24

DISTRIBUTION MANAGEMENT SYSTEMS

HUNT TECHNOLOGIES INC.
Tel: (218) 562-4877 • Web: www.turtletech.com
See ad on page: 1

LOGICA CMG
Tel: (713) 954-7000
Web: www.logicacmg.com/us

SIEMENS POWER TRANSMISSION & DISTRIBUTION, INC.
Tel: (919) 325-7044
Web: www.ptd.siemens.com

DOCUMENT MANAGEMENT & WORKFLOW SOLUTIONS

DOCUMENT IMAGING SOLUTIONS, INC.
Tel: (614) 575-9521
Web: www.disolutions.com

TVD INC. "THE STABLES"
Tel: +64 9 376-6016 • Web: www.tvd.co.nz
See ad on page: 24

DUCT

EECOL ELECTRIC
Tel: (403) 253-1952 • Web: www.eecol.com

PNA/API
Tel: (800) 433-5711
Web: www.petroflexna.com

DUCT - FITTINGS

AMERICAN PIPE & PLASTICS, INC.
Tel: (607) 775-4340 • Web: www.ampipe.com
See ad on page: 94

IPEX
Tel: Canada (866)473-9462
Web: www.ipexinc.com

DUCT - PLASTIC

AMERICAN PIPE & PLASTICS, INC.
Tel: (607) 775-4340 • Web: www.ampipe.com
See ad on page: 94

IPEX
Tel: Canada (866)473-9462
Web: www.ipexinc.com

ELECTRIC DRIVE SYSTEMS

BOHLINGER INC. - UTILITY TRUCK ACCESSORIES
Tel: (610) 825-0440
Web: www.bohlingerinc.com

ELECTRIC ENERGY - PRODUCERS

COMPOSITE POWER CORPORATION
Tel: (509) 943-6599

CON EDISON ENERGY
Tel: (914) 993-2166
Web: www.conedenergy.com

ELECTRIC FIELD MEASUREMENT



INTEGRATED ENGINEERING SOFTWARE

Tel: (204) 632-5636
 Web: www.integratedsoft.com
 See ad on page: 25

ELECTRIC PRODUCTS - MANUFACTURERS



AREVA T&D

Tel: (484) 766-8100 • Web: www.aveva-td.com

BIRD-X

Tel: 800-662-5021 • Web: www.bird-x.com/EEN

FLIR SYSTEMS LTD.

Tel: (800) 613-0507 • Web: www.flir.com
 See ads on page: 93 - 110

UTILITY STRUCTURES INC. (USI)

Tel: (613) 225-6398
 Web: www.utilitystructures.com

ELECTRICAL APPARATUS

EECOL ELECTRIC

Tel: (403) 253-1952 • Web: www.eecol.com

ELECTRICAL APPARATUS - MAINTENANCE

MEGGER

Tel: (214) 333-3201 • Web: www.megger.com
 See ad on page: 11

ELECTRICAL BOXES

BEL PRODUCTS INC.

Tel: (514) 327-2800
 Web: www.belproducts.com

K & H INDUSTRIES INC.

Tel: (716) 549-0135
 Web: www.khindustries.com

ELECTRICAL DEVICES

K & H INDUSTRIES INC.

Tel: (716) 549-0135
 Web: www.khindustries.com

ELECTRICAL EQUIPMENT - DISTRIBUTORS

EECOL ELECTRIC

Tel: (403) 253-1952 • Web: www.eecol.com

ELECTRICAL SERVICES



AREVA T&D

Tel: (484) 766-8100 • Web: www.aveva-td.com

WIRE SERVICES/MANITOBA HYDRO

Tel: (204) 480-5800 • Web: www.wireservices.ca
 See ad on page: 114

ELECTRICAL SOFTWARE



AREVA T&D

Tel: (484) 766-8100 • Web: www.aveva-td.com

ENOSERV LLC.

Tel: (918) 622-4530 • Web: www.enoserv.com



INTEGRATED ENGINEERING SOFTWARE

Tel: (204) 632-5636
 Web: www.integratedsoft.com
 See ad on page: 25

EMERGENCY & HAZARDOUS LOCATION LIGHTS

K & H INDUSTRIES INC.

Tel: (716) 549-0135
 Web: www.khindustries.com

THOMAS & BETTS LIMITED

Tel: (450) 347-5318
 Web: www.tnb-canada.com

EMERGENCY LIGHTING

ENERGIZER CANADA

Tel: (905) 286-6132 • Web: www.energizer.com

HD ELECTRIC COMPANY

Tel: (847) 473-4980
 Web: www.hdelectriccompany.com

K & H INDUSTRIES INC.

Tel: (716) 549-0135
 Web: www.khindustries.com

THOMAS & BETTS LIMITED (EMERGENCY LIGHTING PRODUCTS)

Tel: (514) 685-2277
 Web: www.emergi-lite.com

EMERGENCY LIGHTING/ LED PRODUCTS

THOMAS & BETTS LIMITED (EMERGENCY LIGHTING PRODUCTS)

Tel: (514) 685-2277
 Web: www.emergi-lite.com

ENCLOSURES - CABINETS

A G BODY INC.

Tel: (801) 355-8053 • Web: www.agbody.com
 See ad on page: 159

BEL PRODUCTS INC.

Tel: (514) 327-2800
 Web: www.belproducts.com

ENCLOSURES - CABINETS, EMI SHIELDED

MuSHIELD CO. INC. (THE)

Tel: (603) 666-4433 • Web: www.mushield.com

ENCLOSURES - FIBERGLASS-REINFORCED

HIGHLINE PRODUCTS

Tel: (781) 736-0002
 Web: www.highlineproducts.com

ENCLOSURES - METAL

A G BODY INC.

Tel: (801) 355-8053 • Web: www.agbody.com
 See ad on page: 159

ENCLOSURES - METAL
(Continued)

BROOKS UTILITY PRODUCTS GROUP

Brooks Security Products
Brooks Ekstrom, U.S.A.
Brooks Meter Devices
Tel.: (888) 687-3008 • Web: brooksutility.com
See ad on page: 17

ENCLOSURES - NEMA TYPE

BROOKS UTILITY PRODUCTS GROUP

Brooks Security Products
Brooks Ekstrom, U.S.A.
Brooks Meter Devices
Tel.: (888) 687-3008 • Web: brooksutility.com
See ad on page: 17

IPEX

Tel: Canada (866)473-9462
Web: www.ipexinc.com

ENCLOSURES - POLYMER CONCRETE

HIGHLINE PRODUCTS

Tel: (781) 736-0002
Web: www.highlineproducts.com

SYNERTECH MOULDED PRODUCTS

Tel: (888) 868-5214
Web: www.synertechproducts.com

ENCLOSURES, CRT MONITOR

MAGNETIC SHIELD CORP.

Tel: (630) 766-7800
Web: www.magnetic-shield.com

MuSHIELD CO. INC. (THE)

Tel: (603) 666-4433 • Web: www.mushield.com

ENERGY MANAGEMENT

CON EDISON ENERGY

Tel: (914) 993-2166
Web: www.conedenergy.com

ENTECH USB

Tel.: (207) 833-8383 • Web: www.entech.us

HUNT TECHNOLOGIES INC.

Tel: (218) 562-4877 • Web: www.turtletech.com
See ad on page: 1



ITRON

Tel: (800) 635-5461 • Web: www.itron.com

POWER BROKERS LLC

Tel: (469) 916-1313 274
Web: www.powerbrokersusa.biz

UTILITY MANAGEMENT SERVICES CORPORATION

Tel: 800-875-2268 • Web: www.UJMScorp.com

WATTSWORTH ANALYSIS INC.

Tel: 4169452013 • Web: www.wattsworth.com

ENERGY MANAGEMENT SYSTEMS



AREVA T&D

Tel: (484) 766-8100 • Web: www.aveva-td.com

DATAMATIC

Tel: (214) 540-5037 • Web: www.datamatic.com
See ad on page: 9



HUNT TECHNOLOGIES INC.

Tel: (218) 562-4877 • Web: www.turtletech.com
See ad on page: 1

QEI INC.

Tel: (973) 379-7400 • Web: www.qeiinc.com

SIEMENS

Global network of innovation

SIEMENS POWER TRANSMISSION & DISTRIBUTION, INC.

Tel: (919) 325-7044
Web: www.ptd.siemens.com

ENERGY SAVINGS PRODUCTS

THERMAL TRANSFER CORPORATION

Tel: 412 460 4004
Web: www.hamon-thermaltransfer.com

ENERGY TRADING

LODESTAR CORPORATION

Tel: (978) 532-4555
Web: www.lodestarcorp.com
See ad on page: 23

ENGINE/ EXHAUST DIESEL INSULATION

FIRWIN CORPORATION

Tel: (416) 745-9389 • Web: www.firwin.com
See ad on page: 111

ENGINE/EXHAUST GAS INSULATION

FIRWIN CORPORATION

Tel: (416) 745-9389 • Web: www.firwin.com
See ad on page: 111

ENGINEERING

DIS-TRAN PACKAGED SUBSTATIONS, LLC

Tel: (318) 448-0274 • Web: www.distran.com
See ad on page: 141

GEA EVAPORATION TECHNOLOGIES

Tel: 410 992 7400 • Web: www.evaptec.com



INTEGRATED ENGINEERING SOFTWARE

Tel: (204) 632-5636
Web: www.integratedsoft.com
See ad on page: 25

ENGINEERING - CONSULTANTS



KEMA INC.

Tel: (781) 273-5700 • Web: www.kemainc.com
See ad on the Inside Front Cover

ENGINEERING - CONSULTANTS
(Continued)

SCHWEITZER ENGINEERING LABORATORIES INC.

Tel: (509) 332-1890 • Web: www.selinc.com
See ad on page: 133

UNITED SERVICES GROUP

Tel: (763) 241-3764 • Web: www.usgweb.com

WEIDMANN-ACTI INC.

Tel: (916) 455-2284
Web: www.weidmann-acti.com
See ad on page: 122

ENGINEERING - DESIGN



INTEGRATED ENGINEERING SOFTWARE

Tel: (204) 632-5636
Web: www.integratedsoft.com
See ad on page: 25

THOMAS & BETTS LIMITED (STEEL STRUCTURES DIVISION)

Tel: (888) 687-1777 Ext: 208
Web: www.tnb-canada.com

ENGINEERING - EQUIPMENT

NIRO INC.

Tel: 410 997 8700 • Web: www.niroinc.com

ENGINEERING - PROFESSIONAL SERVICES

AMEC

Tel: (404) 370-3200 • Web: www.amec.com

WIRE SERVICES/MANITOBA HYDRO

Tel: (204) 480-5800 • Web: www.wireservices.ca
See ad on page: 114

ENGINEERING - SERVICES

POSITRON INC.

Tel: (514) 345-2200
Web: www.positronpower.com
See ad on page: 5

WEIDMANN-ACTI INC.

Tel: (916) 455-2284
Web: www.weidmann-acti.com
See ad on page: 122

WIRE SERVICES/MANITOBA HYDRO

Tel: (204) 480-5800 • Web: www.wireservices.ca
See ad on page: 114

ENGINEERING - SERVICES - T & D



AREVA T&D

Tel: (484) 766-8100 • Web: www.aveva-td.com



AVISTAR

Tel: (505) 855-6443 • Web: www.avistarinc.com

WEIDMANN-ACTI INC.

Tel: (916) 455-2284
Web: www.weidmann-acti.com
See ad on page: 122

ENGINEERING - SOFTWARES

ENOSERV LLC.

Tel: (918) 622-4530 • Web: www.enoserv.com



INTEGRATED ENGINEERING SOFTWARE

Tel: (204) 632-5636
Web: www.integratedsoft.com
See ad on page: 25

LINEDSIGN ENGINEERING

Tel: (317) 414-3869
Web: www.linedesignengineering.com

ENGINEERING - STRUCTURAL

THOMAS & BETTS LIMITED (STEEL STRUCTURES DIVISION)

Tel: (888) 687-1777 Ext: 208
Web: www.tnb-canada.com

ENGINES - DIESEL

SRC

Tel: (417) 864-0649

EQUIPMENT - RENTAL

WAGNER - SMITH CO. (THE)

Tel: (817) 447-8085
Web: www.wagnersmithequipment.com

ETHERNET

GARRETTCOM INC.

Tel: 510-438-9071 • Web: www.GarrettCom.com

SCHWEITZER ENGINEERING LABORATORIES INC.

Tel: (509) 332-1890 • Web: www.selinc.com
See ad on page: 133

TC COMMUNICATIONS

Tel: (949) 852-1972 • Web: www.tccomm.com

EVAPORATIVE COOLING EQUIPMENT

ATOMIZING SYSTEMS INC.

Tel: (201) 447-1222 • Web: www.coldfog.com

EXIT SIGNS

AMERICAN PERMALIGHT, INC.

Tel: (310) 891-0924
Web: www.americanpermalight.com

THOMAS & BETTS LIMITED (EMERGENCY LIGHTING PRODUCTS)

Tel: (514) 685-2277 • Web: www.emergi-lite.com

EXPANSION - JOINTS

GENERAL RUBBER CORPORATION

Tel: (800) 233-6294
Web: www.general-rubber.com

FANS



KRENZ & COMPANY INCORPORATED

Tel: (262) 255-2310 • Web: www.krenzvent.com

FANS - INSPECTION, REPAIRS & PARTS



KRENZ & COMPANY INCORPORATED

Tel: (262) 255-2310 • Web: www.krenzvent.com

WEIDMANN-ACTI INC.

Tel: (916) 455-2284
Web: www.weidmann-acti.com
See ad on page: 122

**FANS -
TRANSFORMER-COOLING**

CELTIC TIGER

Tel: (815) 334-1400 • Web: www.celtictiger.com



KRENZ & COMPANY INCORPORATED

Tel: (262) 255-2310 • Web: www.krenzvent.com

WEIDMANN-ACTI INC.

Tel: (916) 455-2284

Web: www.weidmann-acti.com

See ad on page: 122

FASTENERS

WINOLA INDUSTRIAL INC.

Tel: (570) 378-3808

Web: www.winolaindustrial.com

See ad on page: 113

FASTENERS - SPECIAL

WINOLA INDUSTRIAL INC.

Tel: (570) 378-3808

Web: www.winolaindustrial.com

See ad on page: 113

**FENCES SECURITY -
INDUCED PULSE**

**SOUTHWEST MICROWAVE, INC.
SECURITY SYSTEMS DIVISION**

Tel: (480) 783-0201

Web: www.southwestmicrowave.com

See ads on page: 96 - 139

FIBER OPTIC - SENSORS

FISO TECHNOLOGIES

Tel: (418) 688-8065 • Web: www.fiso.com

**FIBER OPTIC C & A -
CABLE PULLERS**

SHERMAN & REILLY INC.

Tel: (423) 756-5300

Web: www.sherman-reilly.com

TSE INTERNATIONAL

Tel: (318) 929-2368

Web: www.tse-international.com

**FIBER OPTIC
COMMUNICATIONS**

RUGGED COM INC.

Tel: (905) 760-7799 • Web: www.ruggedcom.com

**SCHWEITZER ENGINEERING
LABORATORIES INC.**

Tel: (509) 332-1890 • Web: www.selinc.com

See ad on page: 133

TC COMMUNICATIONS

Tel: (949) 852-1972 • Web: www.tccomm.com

**FIBER OPTIC - COMPONENTS
AND ACCESSORIES**

**SCHWEITZER ENGINEERING
LABORATORIES INC.**

Tel: (509) 332-1890 • Web: www.selinc.com

See ad on page: 133

FIBER OPTICS

AMERICAN PIPE & PLASTICS, INC.

Tel: (607) 775-4340 • Web: www.ampipe.com

See ad on page: 94

PHILLIPS-FITEL INC.

Tel: (416) 490-6667 • Web: www.PhillipsFitel.com

**SCHWEITZER ENGINEERING
LABORATORIES INC.**

Tel: (509) 332-1890 • Web: www.selinc.com

See ad on page: 133

FIBERGLASS

CUSTOM COMPOSITES INC.

Tel: (906) 353-6660

Web: www.customcompositesinc.com

**HASTINGS
FIBERGLASS PRODUCTS INC.**

Tel: (269) 945-9541 • Web: www.hfgp.com

See ad on page: 30

FIBERGLASS - PIPE, TANK

**HASTINGS
FIBERGLASS PRODUCTS INC.**

Tel: (269) 945-9541 • Web: www.hfgp.com

See ad on page: 30

FIELD AUTOMATION

DATAMATIC

Tel: (214) 540-5037 • Web: www.datamatic.com

See ad on page: 9

PENTAX TECHNOLOGIES

Tel: (800) 543-6144 • Web: www.pentaxtech.com

FILTRATION - LIQUID SYSTEMS

BRACKETT GREEN USA INC.

Tel: (281) 480-7955 • Web: www.bgusa.com

ERTELALSOP

Tel: (845) 331-4552 • Web: www.ertelalsop.com

GEA FILTRATION

Tel: 715 386 9371 • Web: www.geafiltration.com

FILTRATION EQUIPMENT

HILLIARD CORPORATION

Tel: (607) 733-7121

E-mail: hilliard@hilliardcorp.com

FILTRATION SYSTEMS - OIL



VELCON FILTERS INC.

Tel: (719) 531-5855 • Web: www.velcon.com

FINANCIAL SYSTEMS

**APPLIED TECHNOLOGY
SOLUTIONS INC.**

Tel: (910) 937-0287

Web: www.atcorporation.com

FLAME RESISTANT CLOTHING

CARHARTT, INC.

Tel: (313)749-6612 • Web: www.carhartt.com

See ad on page: 21

CINTAS CORPORATION

Tel: (513) 754-3649

Web: www.cintas-corp.com

GRANSFORS BRUKS (CANADA) INC.

Tel: (905) 681-3993 • Web: www.gransfors.com

RANPRO, INC.

Tel: (519) 426-1094 • Web: www.ranpro.com

See ad on page: 90

TYNDALE COMPANY, INC.

Tel: (800) 356-3433 • Web:

www.FRclothing.com

WORKRITE UNIFORM COMPANY

Tel: (805) 483-0175 • Web: www.workrite.com

See ad on Divider #2 Recto

FLAME RESISTANT FABRICS

**INDUSTRIAL
ENERGY PRODUCTS, INC.**

Tel: 717-285-4437 • Web: www.iepfire.com

FLASHLIGHTS

ENERGIZER CANADA

Tel: (905) 286-6132 • Web: www.energizer.com

FLUID MANAGEMENT - OIL RECYCLING

A.F. WHITE LTD

Tel: (519) 752-7646 • Web: www.afwhite.on.ca
See ads on page: 44 - 153

FUSELINK - CUTOUTS

HUBBELL CANADA INC.

Tel: (905) 839-1138
Web: www.hubbellpowersystems.ca

FUSES

EECOL ELECTRIC

Tel: (403) 253-1952 • Web: www.eecol.com

FUSES - CURRENT LIMITING

HUBBELL CANADA INC.

Tel: (905) 839-1138
Web: www.hubbellpowersystems.ca

GARMENT - FLAME RESISTANT , BREATHABLE

WORKRITE UNIFORM COMPANY

Tel: (805) 483-0175 • Web: www.workrite.com
See ad on Divider #2 Recto

GAS AND RELATED PRODUCTS

CON EDISON ENERGY

Tel: (914) 993-2166
Web: www.conedenergy.com

GAS MONITORS

MORGAN SCHAFFER SYSTEMS, INC.

Tel: (514) 739-1967
Web: www.morganschaffer.com
See ads on page: 109 - 123

GAS MONITORS - PERMANENT SYSTEMS

MORGAN SCHAFFER SYSTEMS, INC.

Tel: (514) 739-1967
Web: www.morganschaffer.com
See ads on page: 109 - 123

GAS MONITORS - PORTABLE

MORGAN SCHAFFER SYSTEMS, INC.

Tel: (514) 739-1967
Web: www.morganschaffer.com
See ads on page: 109 - 123

GAUGES - LIQUID

CELTIC TIGER

Tel: (815) 334-1400 • Web: www.celtictiger.com

WEIDMANN-ACTI INC.

Tel: (916) 455-2284
Web: www.weidmann-acti.com
See ad on page: 122

GAUGES - PRESSURE

CELTIC TIGER

Tel: (815) 334-1400 • Web: www.celtictiger.com

FISO TECHNOLOGIES

Tel: (418) 688-8065 • Web: www.fiso.com

WEIDMANN-ACTI INC.

Tel: (916) 455-2284
Web: www.weidmann-acti.com
See ad on page: 122

GAUGES - TEMPERATURE

CELTIC TIGER

Tel: (815) 334-1400 • Web: www.celtictiger.com

FISO TECHNOLOGIES

Tel: (418) 688-8065 • Web: www.fiso.com

WEIDMANN-ACTI INC.

Tel: (916) 455-2284 • Web: www.weidmann-acti.com
See ad on page: 122

GAUGES - VACUUM

CELTIC TIGER

Tel: (815) 334-1400 • Web: www.celtictiger.com

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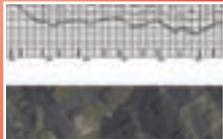
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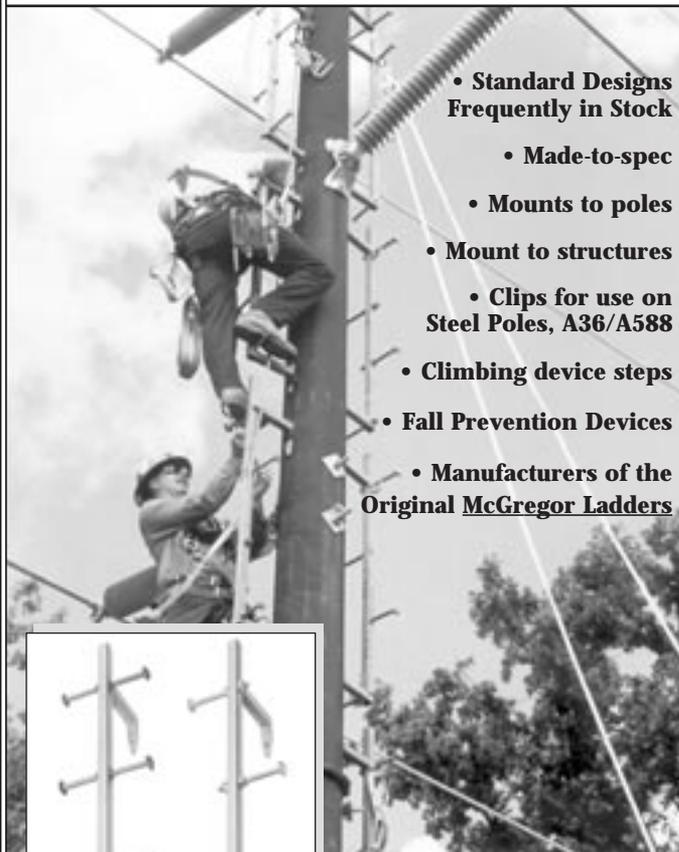
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OSMOSE INC.
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Web: www.cunaproducts.com

OSMOSE INC.
Tel: (406) 449-6216 • Web: www.osmose.com

POLES - UTILITY (Continued)

PENNSUMMIT TUBULAR, LLC

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 Web: www.pennsummit.com
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POWCO STEEL PRODUCTS LIMITED

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**THOMAS & BETTS LIMITED
 (STEEL STRUCTURES DIVISION)**

Tel: (888) 687-1777 Ext: 208
 Web: www.tnb-canada.com

**TRANSAMERICAN
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**POWER - LINE CARRIER
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PULSAR TECHNOLOGIES INC.

Tel: (954) 344-9822 • Web: www.pulsartech.com



TRENCH LIMITED

Tel: (416) 298-8108
 Web: www.trenchgroup.com
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QEI INC.

Tel: (973) 379-7400 • Web: www.qeiinc.com

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Tel: (909) 279-6684

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Tel: (508) 339-3000 • Web: www.datel.com
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**POWER DISTRIBUTION
 AND/OR TRANSMISSION POLES**

PDO

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Web: www.pwrqualitysys.com
See ad on page: 129

POWERWARE

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POWER QUALITY - TEST EQUIPMENT



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Web: www.pwrqualitysys.com
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SOFTSWITCHING TECHNOLOGIES

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Tel: (509) 332-1890 • Web: www.selinc.com
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Tel: (262) 703-5800
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MIKRON INFRARED INC.

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E-mail: grada@superproductscorp.com

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Tel: (262)784-7100

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LOCUS, INC.

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REACTORS - SHUNT FILTER

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Web: www.trenchgroup.com

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Web: www.hdwelectronics.com
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Web: www.southwestmicrowave.com

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FILNOR INC.

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RESISTORS - POWER

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GALVAN INDUSTRIES, INC.

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Web: www.atlanticbraids.com
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ROPE - NYLON

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Web: www.atlanticbraids.com
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DATRIA SYSTEMS INC.

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EECOL ELECTRIC

Tel: (403) 253-1952 • Web: www.eecol.com

PAUWELS CANADA INC.

Tel: (204) 452-7446 • Web: www.pauwels.com

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SUBSTATION - REACTIVE COMPENSATION

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Tel: (919) 325-7044

Web: www.ptd.siemens.com

SUBSTATION - STEEL, STRUCTURE

DIS-TRAN PACKAGED SUBSTATIONS, LLC

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J & Y ENGINEERING SERVICES INC.

Tel: (440) 891-1130 • Web:

www.prosavvy.com/affiliates/jyengineering

PENNSUMMIT TUBULAR, LLC

Tel: (888) 84POLES Ext. 5008

Web: www.pennsummit.com

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SUBSTATION - SUBSTATION - HVDC

SIEMENS POWER TRANSMISSION & DISTRIBUTION, INC.

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Web: www.ptd.siemens.com

SUBSTATION - WOOD, TREATED

HUGHES BROTHERS INC.

Tel: (402) 643-2991

Web: www.hughesbros.com

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Web: www.waukeshaelectric.com

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Web: www.citelprotection.com

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Tel: 800-677-9089 • Web: www.erico.com

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Brooks Security Products
Brooks Ekstrom, U.S.A.
Brooks Meter Devices
Tel.: (888) 687-3008 • Web: brooksutility.com
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CITEL INC.

Tel: (305) 621-0022
Web: www.citelprotection.com

LAPRAIRIE INC.

Tel: (905) 830-9975 • Web: www.laprairieinc.com
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SURPLUS ASSET SALES

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Web: www.belyeapower.com

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HUGHES BROTHERS INC.

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Web: www.hughesbros.com
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**THOMAS & BETTS LIMITED
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Web: www.tnb-canada.com

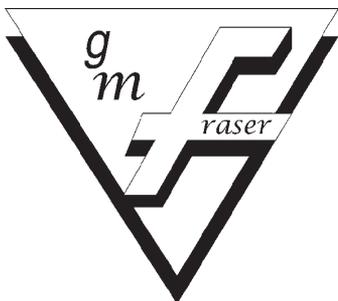
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DWYER INSTRUMENTS INC.
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SWITCHES - OIL

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Brooks Security Products
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FILNOR INC.
Tel: (330) 821-7667 • Web: www.filnor.com
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MEGGER
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SWITCHES - TRANSFER

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GENTRAN CORP
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Web: www.beckwithelectric.com

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SCHWEITZER ENGINEERING LABORATORIES INC.

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Tel: 919-942-4214 • Web: www.usatcorp.com

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MEGGER

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TAGS

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TANKS - STEEL

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TAPE - MARKING

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Tel: (800)231-6074
Web: www.reefindustries.com

D&R ELECTRONICS CO. LTD

Tel: (905) 660-0620
Web: www.dandrelectronics.com

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Web: www.reefindustries.com

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INIVEN

Tel: (800) 526-3984 • Web: www.iniven.com
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Tel: (888) 84POLES Ext. 5008
 Web: www.pennsummit.com
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POSITRON INC.

Tel: (514) 345-2200
 Web: www.positronpower.com
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SCHWEITZER ENGINEERING LABORATORIES INC.

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 See ad on page: 133

TEREX TELELECT

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 See ad on page: 19

TELECOMMUNICATIONS - CONDUIT

IPEX

Tel: Canada (866)473-9462
 Web: www.ipexinc.com

TELECOMMUNICATIONS - CONSULTING

KEMA INC.

Tel: (781) 273-5700 • Web: www.kemainc.com
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 See ad on page: 133

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 Web: www.microwavedata.com
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Tel: (604) 574-6470
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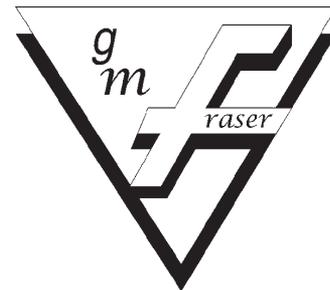
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Impact of Distributed Generation

on the Protection of Distribution Networks

By: Kimmo Kauhaniemi, Lauri Kumpulainen, Paul Buchanan
University of Vaasa, Finland, VTT Technical Research Centre of Finland, Manitoba HVDC Research Centre



OVERVIEW

This article is based on power system simulation studies carried out by VTT Processes of Finland (a division of VTT Technical Research Centre of Finland that conducts research in the area of bioenergy and distributed energy), and the University of Vaasa. The PSCAD (Power System Computer-Aided-Design) power system simulation software developed by the Manitoba HVDC Research Centre has been applied to these studies. One of the key issues has been to verify that traditional network protection schemes and settings are simply not adequate when there are Distributed Generation (DG) systems connected to the network. The protection coordination between network protection and the protection of the DG units has also been studied. The results of these studies will be used to focus further research and development in protection systems and concepts.

WIND ENERGY INTERCONNECTION

As a renewable energy source, wind turbines are gaining great popularity. They are relatively low in capital cost, and can be brought into service relatively quickly. It is not surprising then that investors are looking at large wind farms with power ratings of the order of hundreds of MW, and in some cases, simulation studies are investigating capacities of thousands of MW of Wind Energy. In addition to large wind farms connected to transmission networks, smaller wind farms and individual wind power plants connected to distribution networks, are being built.

The protection and control requirements of wind power systems are different in transmission networks and distribution networks. Transmission network operators are interested in power system stability issues. There are set requirements that must be met related to the control of active power, voltage and frequency. In network fault situations, fault tolerance may be required in order to avoid major disturbances due to common mode tripping. In distribution networks however, the requirements are often quite different, e.g. instead of fault tolerance, rapid disconnection of DG is required in the event of network faults.

To be able to maintain power quality and reliability of a distribution network or a transmission network, the impact of wind power must be carefully studied. The interaction between a power plant and the power system is typically verified by means of power system simulations. In order to make these simulations possible, wind farm owners are required to provide system operators with the complete system models. Dynamic simulation using accurate system models is an indispensable tool both in transmission and distribution level interconnection studies.

THE IMPACT OF DISTRIBUTED GENERATION

Traditionally distribution networks have been designed to operate radially so that the power flows from upper voltage levels down to customers situated along the radial feeders. This has enabled a relatively straightforward protection strategy. When applying over-current protection, for example, it has been possible to assume that the fault current can have only one direction. However, this is now not always true if there are distributed generation (DG) units such as wind turbines in the network! As the share of distributed generation increases, distribution networks are becoming more like transmission networks where generation and load nodes are mixed, and a more complex protection system design is unavoidable.

In order to analyze the effects of distributed generation on the requirements for the protection of distribution networks, power system simulation studies are required. The dynamic modeling of various types of DG technologies such as wind energy is a necessity.

POTENTIAL PROBLEMS TO PROTECTION

Power system simulation and modeling studies have shown that distributed generation causes several challenges to the protection of distribution networks. The most commonly mentioned problems are the following:

- False tripping of feeders (sympathetic tripping)
- Nuisance tripping of production units
- Blinding of protection
- Increased or decreased fault levels
- Unwanted islanding
- Prohibition of automatic reclosing
- Unsynchronized reclosing

The appearance of these kinds of problems depends on both the characteristics of the network and DG. E.g., in short-circuit faults a wind power plant generates fault current that depends strongly both on the wind turbine generator type and the network configuration. Synchronous

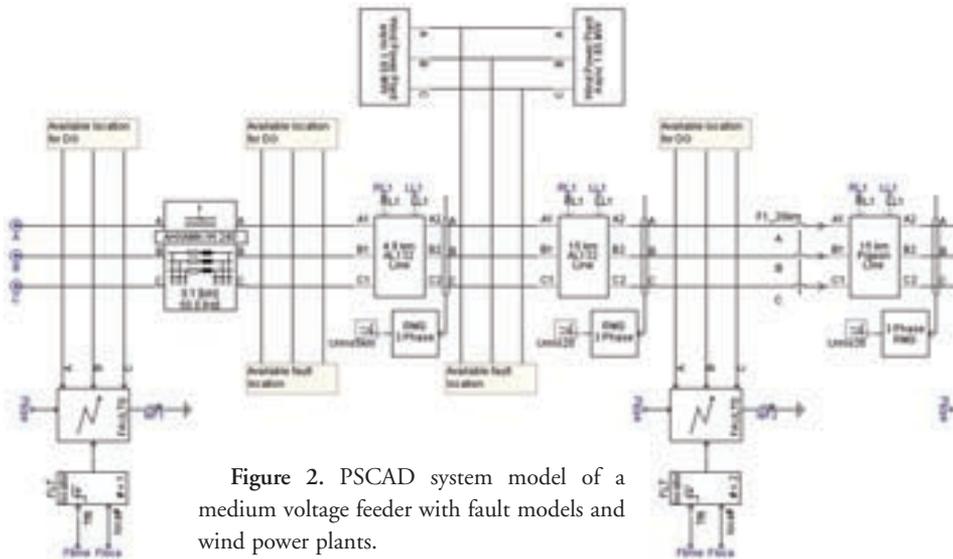


Figure 2. PSCAD system model of a medium voltage feeder with fault models and wind power plants.

generators are able to feed rather large sustained fault current while inverter based systems may be controlled so that their output may be limited even to the rated current. From the point of view of protection coordination, the location of the fault in relation to generator and protection devices dictates the outcome of the fault situation.

Some critical problems related to DG are evaluated:

- a) The blinding of protection
- b) False tripping
- c) Anti-islanding protection
- d) Auto-reclosing

THE BLINDING OF PROTECTION - PREVENTING OVERCURRENT RELAY OPERATION

When a large distributed generation production unit or several small ones are connected to a medium voltage network, the fault current seen by the feeder protection relay may be reduced, which can lead to the prevention of the operation of overcurrent relays. This is also called protection under-reach.

Theoretically the problem can be described as follows. A situation, where a production generator unit is connected in a medium voltage (MV) feeder close to a primary substation, is studied. When a fault occurs at the end of the feeder the fault current consists of contributions both from the grid (I_1) and from the generator (I_2) as shown in Figure 1. The impedances involved in this situation are:

- Z_g = impedance of the grid and the primary transformer
- Z_g = impedance of the generator
- Z_L = impedance of the feeder (line)

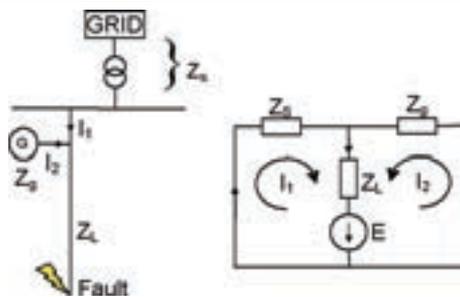


Figure 1. Short-circuit fault in MV network and the corresponding single phase Thévenin equivalent circuit.

The current contribution from the distributed generator reduces the current seen by the feeder relay. We can conclude that the impact of the production unit increases with the size of the generator and with the length of the line section between the production unit and the fault.

Simulation Results

Figure 3 presents power system simulation results of the current seen by the feeder overcurrent relay, when a large (8 MW) synchronous generator (an example of distributed generation) is connected to different locations (0 km, 12 km, 20 km and 34 km) on the feeder, and a three-phase fault occurs at the end of the feeder. The relay pickup current is 300 A, and the time delay is 0.5 s. The fault current without the power plant would be ca. 420 A. The fault occurs at time 10.1 s. In three of the above mentioned cases, the power plant reduces the current seen by the protection so much that the relay will not start until the power plant trips, which in these cases takes several seconds.

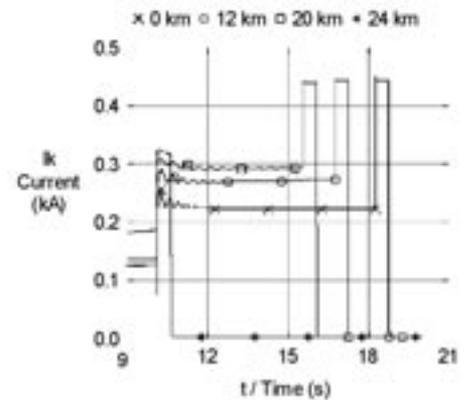


Figure 3. Current seen by the feeder overcurrent relay when the distance of a distributed power source from the substation is varied.

FALSE TRIPPINGS

The basic principle of false tripping is shown in Figure 4. The short-circuit fault occurs on feeder 2, but also feeder 1 is tripped because of overcurrent fed by the DG unit. False tripping (sympathetic tripping) is typically caused by synchronous generators, which are capable of feeding sustained short-circuit current.

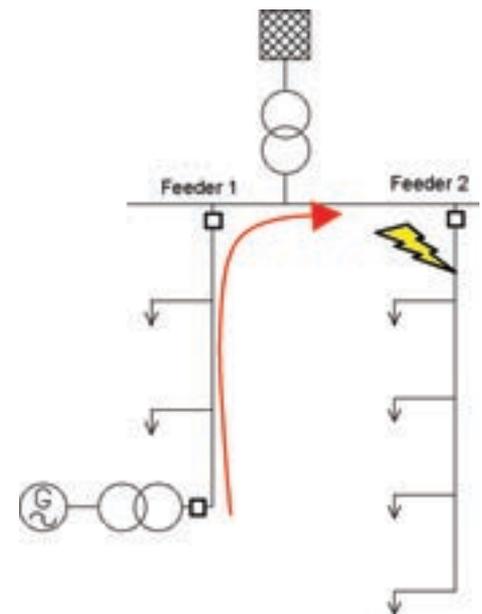


Figure 4. Principle of false tripping due to Distributed Generation.

In our study, false tripping of a healthy feeder system was verified by simulations with the 8 MW synchronous generator model. Figure 5 presents an example where a 3-phase short-circuit fault on an adjacent feeder causes the false tripping of feeder 1, because the power plant on feeder 1 feeds short-circuit current to the fault.

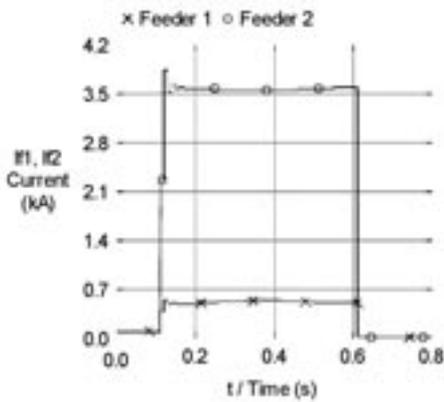


Figure 5. Example of false tripping caused by a short-circuit fault on adjacent feeder.

False tripping of healthy feeders can likely be solved by directional overcurrent relays, but with the following consideration: Protection against the bus faults may have to be changed. There should be a transfer trip from the main infeed relays (overcurrent relays on the secondary side of the primary transformer) and the arc protection relays to the feeder relays for the feeders having a significant amount of DG connected.

ANTI-ISLANDING PROTECTION

In the case of a sudden loss of grid connection, a part of the network may keep operating as an island. In most cases this is not desirable for the following reasons:

- Reconnection of the islanded part becomes complicated, especially when automatic reclosing is used. This can lead to damage of equipment and can decrease the reliability of the network.
- The network operator is unable to guarantee the power quality in the island. There could be abnormal voltage levels or frequency fluctuations, and the fault level may be too low resulting in the overcurrent protection not working the way it is designed.
- Safety problems to maintenance personnel arise when de-energized circuits are back-fed.

In terms of achieving an adequate safety and reliability level in the distribution system, Anti-islanding protection is generally considered necessary. The rules and guidelines vary from country to country but requirements similar to the following are often given:

- DG should be disconnected from the network in the case of an abnormality in voltage or frequency.
- If one or more phases is disconnected from the grid supply the DG should be rapidly disconnected from the network.
- If auto-reclosing is applied, the DG units must disconnect clearly before the reclosing, so that there will be enough time for the fault arc to extinguish.

Anti-islanding protection is very hard to accomplish by traditional means, e.g., the basic under-/over-voltage and under-/over-frequency relays may fail to operate if the power mismatch in the island that is created in the islanding situation is close to zero.

AUTORECLOSING

In overhead medium voltage networks, automatic reclosing is a very effective means to clear faults. In Finland for example, approximately 80% of faults can be cleared with high-speed autoreclosing and 15% with time-delayed autoreclosing. The impact of autoreclosing is based on the extinction of arc during the dead time of the reclosing sequence. In the Nordic countries of Europe, dead time is typically only 0.3 s.

Distributed generation seems to be rather incompatible with present reclosing practices. In suitable conditions, DG may prevent the arc extinction and the momentary fault can become a permanent fault. During the circuit breaker open time of the reclosing sequence, the generators in the network usually tend to drift away from the synchronism with respect to the grid. Thus the reconnection made without any synchronization, which is the usual way, may cause serious damages to the distributed generators, as well as high currents and voltages in the neighboring network.

Power system simulation studies have confirmed the high risk of out-of-phase reclosing. It can be safely stated that rapid and reliable loss-of-mains protection is needed. Distributed Generation units must be disconnected very rapidly during the breaker open time of an auto-reclosing sequence.

SUMMARY

According to the simulation studies performed with PSCAD, the proper coordination of the protection of network and distributed generation units is highly important in order to avoid false tripping of protection devices. In certain cases directional protection is also necessary. And, DG units that are capable of providing large short-circuit current may prevent the operation of feeder relays.

The primary results of these simulation studies have provided a clear indication of the potential protection problems that need to be solved by careful protection design or possibly through the introduction of new protection algorithms. Solutions are urgently needed since the percentage of distributed generation is increasing rapidly.

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FURTHER READING

1. Brahma, S.M., Girgis, A.A., 2002, IEEE PES Winter Meeting, Vol. 1, "Microprocessor-Based Reclosing to Coordinate Fuse and Recloser in a System with High Penetration of Distributed Generation", 453 – 458
2. Guillot, M., Collombet, C., Bertrand, P., Gotzig, B., 2001, CIREN, IEE Conf, Pub. No. 482, "Protection of Embedded Generation Connected to a Distribution Network and Loss of Mains Detection"
3. Jenkins, N., Allan, R., Crossley, P., Kirschen, D., Strbac, G., 2000, Embedded Generation, IEE
4. Redfern, M.A., Usta, O., Barrett, J.I., Fielding, G., 1993, 5th Int. Conf. on Developments in Power System Protection, "A new digital relay for loss of grid to protect embedded generation", 127 -130
5. DEFU, 1995, Relæbeskyttelse ved decentrale produktionsanlaeg med synkron-generatorer. Teknisk rapport 293, 2. udgave
6. Dugan, R.C., McDermott, T.E., 2002, IEEE Ind. Appl. Mag., Mar/Apr. 2002, 19 - 25
7. Sobrink, K., Lovstrom Sorensen, P., ELTRA, Joncquel, E., EDF R&D, Woodford, D.A., Electranix Corp. Feasibility Study on Integration of LÆSØ SYD 160 MW Wind Farm using VSC Transmission", CIGRE SC14 Colloquium, Three Gorges Dam Site, 31 August, 2001. See also www.electranix.com/Papers/CIGRE-2001-VSCWind.pdf
8. Matevosyan, J., Ackermann, T., Bolik, S., Söder, L., Comparison of International Regulations for Connection of Wind Turbines to the Network. Nordic Wind Power Conference – 2004: Grid Integration and Electrical Systems of Wind Turbines and Wind Farms. Chalmers University of Technology, Gothenburg, Sweden, 1-2 March 2004.

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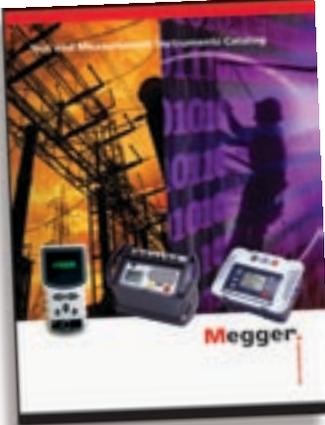
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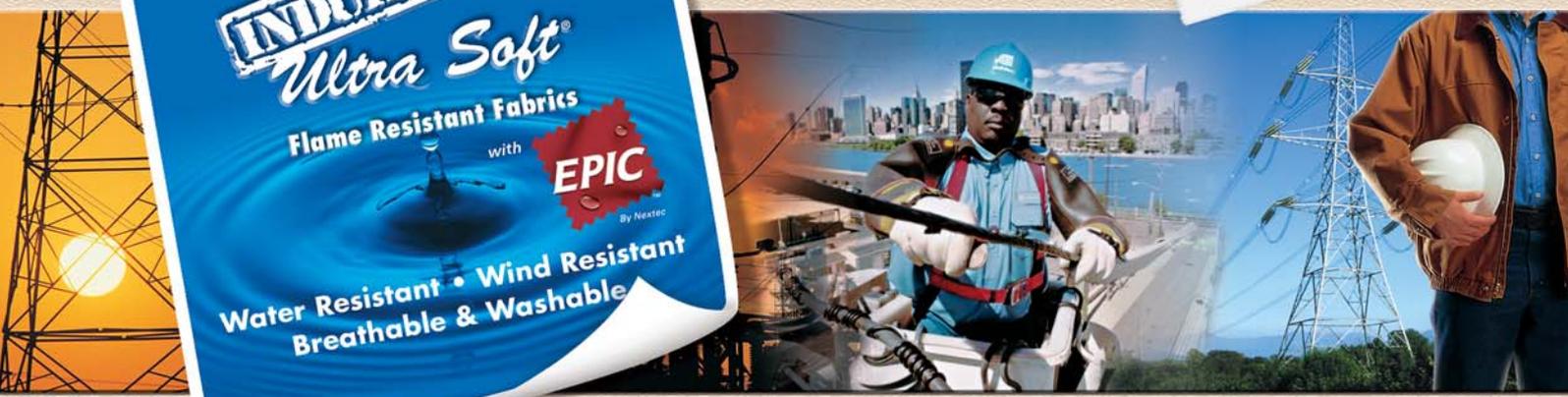
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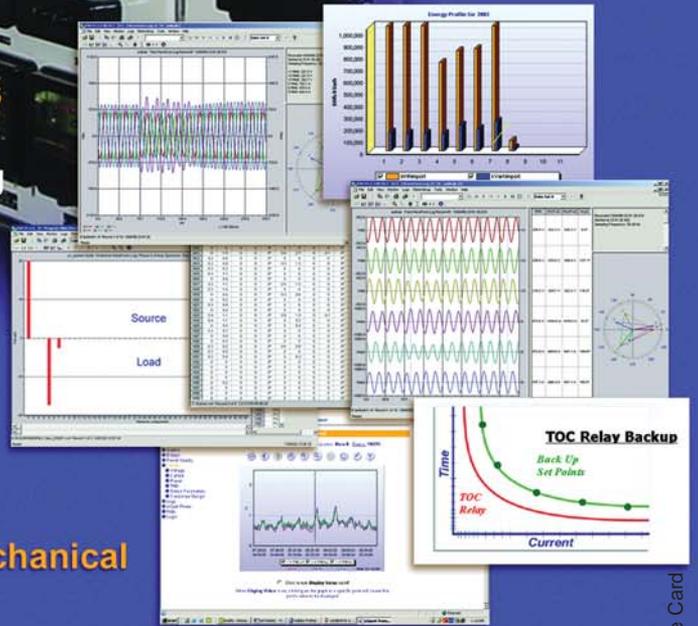
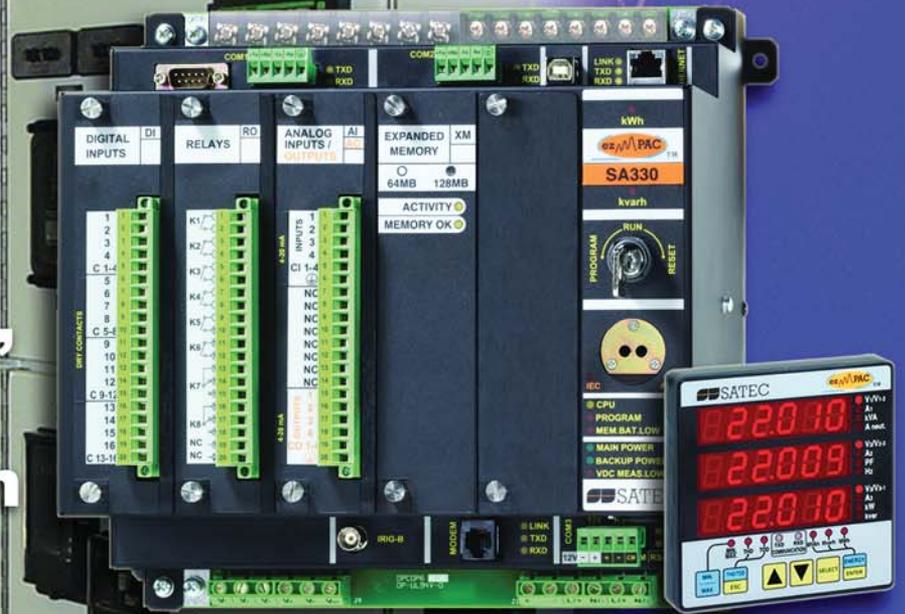
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