

Electrical Business

THE AUTHORITATIVE VOICE OF CANADA'S ELECTRICAL INDUSTRY



Also in this issue...

Engineering technology can minimize arc flash hazard (Page 12)

Learn to install—and especially sell—photovoltaics (Page 14)

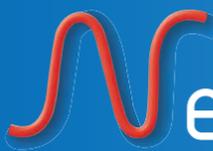
Getting shoppers, and turning them into buyers (Page 20)



Electrical safety only happens with awareness

An exclusive Electrical Business Round Table Discussion!


LEAD FREE WIRE AND CABLE

 **nexans**
www.nexans.ca



PM # 40063602 PAP registration # 10774



Energy Saving CFL

To complement its CFL product line **STANDARD™** introduces:



Cold Cathode CFL

- Uses 80% less energy than incandescent
- Ideal for frequent start, rapid flashing and dimming applications
- Lasts 25 000 hours. Save on energy and maintenance costs
- Excellent color consistency
- Color coating resistant to fading and the effects of UV



High Power Factor CFL

- A more efficient CFL lamp
- Lower Total Harmonic Distortion (THD)



T2 CFL

- Super mini size - shorter than average CFL lamp at equal wattage
- Fits most fixtures



A shape CFL

- Direct replacement to conventional incandescent or halogen A19 lamps
- Gives the look of an incandescent lamp but with the cost and energy saving of a CFL



GU24 CFL

- The GU24 base is an easy to use pin-based socket that twists and locks into place
- GU24 base makes it easier to use energy-efficient light fixtures in commercial and residential applications
- A full line to accommodate your needs



On qualified products



Lighting the Way
for a Greener Tomorrow

Think about the future... choose energy efficient lighting today!

For more information on energy saving products please visit us at
www.standardpro.com

ELECTRICAL BUSINESS is the magazine of the Canadian electrical industry. It reports on the news and publishes articles in a manner that is informative and constructive.

Editor

Anthony Capkun - acapkun@clbmedia.ca

Publisher

John MacPherson - jmacpherson@clbmedia.ca

Account Manager

Scott Hoy - shoy@clbmedia.ca

EB Editorial Advisory Board

Tom Crist, Kerry Heid, Ron Bergeron, Stephen Tatrallyay, Dan Mott, John Vickery, Ian Dempsey and Pierre Dowd

Art Director

Svetlana Avrutin - savrutin@clbmedia.ca

Production Manager

Robert Russell - rrussell@clbmedia.ca

Editorial Intern

Scott Hamilton - shamilton@clbmedia.ca

Creative Director

Einar Rice - erice@clbmedia.ca

Manager, Production

Lisa Drummond - ldrummond@clbmedia.ca

Subscriber Customer Service Representative

Kristen Schulz-Lacey - kschulz-lacey@clbmedia.ca

CLB MEDIA Inc.

240 Edward Street, Aurora, ON L4G 3S9
Tel: 905-727-0077 Fax: 905-727-0017

President

Stuart Morrison

Vice President, Media, Publishing

Niel Hiscox

Vice President, Finance/Corporate Development

Kent Milford

Vice President, Human Resources

Susan Bishop

Vice President, IT and Operations

David Overall

Director, Industrial Group

Frank Shoniker

Director, Professional Group

Karen Lorimer

Director, Manufacturing Group

Nigel Bishop

Director, Editorial and Production

Jackie Roth

Director, Facility Management and Logistics

Steve Dale

Director, Human Resources

Denise Desrosiers

Director, Product & Business Development

Todd Phillips

Director, IT

Phillip Damianidis

Circulation

Nancy Gaston - ngaston@clbmedia.ca

Urszula Grzyb - ugrzyb@clbmedia.ca

SUBSCRIPTION RATES:

Canada: Single issue \$7.00 • Ten issues: \$35.00 (including tax)

USA: \$59.00 (US) and International: \$75.00 (US) per year

United States Second Class Postage Paid at Lewiston, NY

(USPS-741-470) US POSTMASTER: send address changes to

ELECTRICAL BUSINESS, P.O. Box 8145, Lewiston, NY 14092

The contents of Electrical Business are copyright by ©2009 CLB Media Inc. and may not be reproduced in whole or part without written consent. CLB Media Inc. disclaims any warranty as to the accuracy, completeness or currency of the contents of this publication and disclaims all liability in respect of the results of any action taken or not taken in reliance upon information in this publication. REPRINTS: Contact The Reprint Outsource at (877) 394-7350.

PAP Registration No. 10774

Send address changes to:

ELECTRICAL BUSINESS

240 Edward Street, Aurora, ON L4G 3S9

Return Postage Guaranteed

Canada Post - Canadian Publications Mail Sales Products

Agreement 40063602 ISSN 0013-4244

Printed in Canada

We acknowledge the assistance of the Government of Canada through the Publications Assistance Program toward our mailing costs.



Is skilled labour really in short supply?

“Canada is facing one of the most serious shortages of skilled labour in the industrial world, second to Mexico. More than 60% of Canadian entrepreneurs state they have difficulties finding qualified workers. This obstacle has certainly become one of the biggest risk factors for construction companies.”

So opens the invitation to a panel presented at Construct Canada last month. The discussion revolved around the skilled labour (or lack thereof) crisis, and encompassed everything from employee attitudes and poaching to the education system, pressure on manufacturers to develop easier-to-use products, and so forth. And it got me thinking: I've heard all of this before.

Like a broken record, there's always some kind of discussion around these topics at just about every industry event I attend, especially when it comes to employee attitudes and poaching. There's always a sob story about how an employer invested a lot of money into an employee, only to have that worker jump to another employer, seemingly for a “just a couple of bucks” more.

That's a load of garbage, and even when believing this helps you sleep better at night, it's still a load of garbage.

The bottom line is that employees don't jump from one employer to another for “just a couple of bucks” more. There's way more to it than that, especially with younger generations.

One idea/fact that I fully agree with is that the construction industry is slow to change, and this may be why you're one of the guys losing employees to poachers. You simply haven't reevaluated your hiring/retention practices. You do not make it a priority to read any literature or attend any seminars that

address the “human” facet of your business. Oh sure, you might have the newest fleet on the road carrying the coolest tools, but if you don't develop a proactive human resource strategy, it's all for nothing.

Who's going to drive those trucks or use those tools if you don't offer wages that are consistent with industry standards? If you don't offer creative incentive programs, or a decent benefits package? If you don't offer solid career-building opportunities and well-defined career paths?

Your human resources strategy starts right at the beginning—before you hire someone—with a purposeful and intensive interviewing strategy that helps uncover just the right candidate for your company. After hiring, you have to be inventive and diligent with your retention strategy. And not every strategy will work with every employee. For example, someone might be content to just have use of the company truck. Another employee may require more responsibility and greater challenges to keep him on board. Yet another employee may demand more training and education opportunities.

The solutions are just as varied as the challenges, but people are people: they don't leave a great work environment for “just a couple of bucks” more. So develop and implement a top-notch employee hiring and retention strategy. Create a great work environment, and we'll see whether it's true that you just can't find good help these days.

Anthony Capkun

CONTENTS



On the cover and page 8

Awareness the key to staying alive An exclusive Electrical Business Round Table discussion on electrical safety

It was against the backdrop of CSA's Conference Series on Workplace Electrical Safety (2009 CE Code/CSA Z462) that Electrical Business conducted an intimate and informal Round Table discussion on electrical safety over dinner with prominent industry players—all of whom (with the exception of one) were speakers at the conference itself. While the conversation ranged to and fro, one solid concept continued throughout: that greater electrical safety awareness is needed in the industry overall to ensure everyone returns safely home. Photos by Jean Héguy.

FEATURES

12 Using engineering technology to minimize arc flash hazard

The engineering approach toward minimizing the arc flash hazard involves controlling/containing the contributing factors, which are: amount of arcing current; the time that it flows; and the distance of the worker from the arc itself. The first two of these three factors can easily be minimized during the design of the electrical system.

14 Be a part of Canada's solar power explosion

Despite our relatively low electricity costs and abundance of hydro-generated electricity, solar still makes a strong case in Canada. Electrical demand is growing 2% annually. Add rising electricity costs, peak load pricing, tiered rates, etc., and you can see how the case for solar only gets stronger.



18 Regional Focus

Move over Iran—here comes a nuclear Saskatchewan, Ontario says no to furthering nuclear in the province, copper thefts at NB Power lead to arrests, Northwest Territories strategizing for hydro, and more.

DEPARTMENTS

- 4 Industry News
- 6 Calendar
- 7 Personalities
- 16 Mind Your Safety
A litany of limbs
- 20 It's Your Business
Getting shoppers, and turning them into buyers
- 21 Vehicles and Accessories
Products for cutting, boring, drilling, bending, twisting and turning
- 22 Products
- 24 Multimedia Resources
- 25 Product Showcase
- 26 Code File
The importance of tree and vegetation management
- 26 Code Conundrum



page 21



Bill Krotz, Ideal Supply's safety specialist, is on tour with the Safety Supplies van to show you the latest in safety solutions.

Ideal Supply/Global Tools safety supplies truck

A new, Safety Supplies van has been put on the road by Ideal Supply and Global Tools, and is available for viewing by customers in Southwestern and Central Ontario. The van is fully stocked with state-of-the-art hearing, head and eye protection, as well as fall arrest and arc flash protection, and power tools. To request a visit from Ideal's safety specialist, Bill Krotz, call (519) 291-0550 or e-mail bkrotz@idealsupply.com. Krotz is fully trained on product and relevant workplace safety legislation.

ESC says Canada's electrical industry may be in jeopardy

A critical shortage of electrical engineers and tradespeople in Canada could severely affect the electrical industry, says the Electricity Sector Council (ESC). In its 2008 workforce planning report, "Powering Up the Future", the council states that, despite job security, competitive compensation and excellent retention rates, a labour shortage will soon put Canada's electricity sector at risk.

Demographic factors such as retiring workforces will fuel the shortage, with an annual retirement rate of 6.2% by 2012, and 28.8% of the current electricity workforce is expected to retire within the next four years. A declining supply of trained young workers will also increase the labour shortage.

To avoid this challenge, the report recommends a number of strategies: encourage recruitment of foreign-trained workers and traditionally under-employed groups (such as women), the aboriginal community, immigrants and visible minorities; collaborate with industry, employers and educational institutions to draw graduates from electricity-related programs; and stem retirement's tide through succession planning.

FLIR wins at Plus X Awards

The Plus X Awards is a European contest for technology, sport and lifestyle products, honouring innovative design as the basis of ongoing commercial success by selecting the products that have the best credentials in five categories.



At this year's awards ceremony in Cologne, Germany, FLIR Systems scooped up not only six Plus X Awards for two of its thermal imaging cameras, but also the award for Most Innovative Brand of The Year.

The two IR cameras submitted for judging were the P660 (shown in photo) and i5. Both were judged on innovation, design, ease of use/functionality, ergonomics and ecology. Because FLIR totalled more Plus X Awards in its product group than any other entrant, it was named recipient of the Most Innovative Brand of the Year.

Skilled trades continue to pay more

More than one million people worked in skilled trades in 2007, reports StatsCan, where employment growth has been a steady 2.2% a year on average since the recession of the early 1990s. This group includes trades where a licence or certificate may be a condition of employment.

In 1987, Alberta accounted for 9% of all trades employment; by 2007, this proportion had increased to 15%. During

the same period, the proportion for British Columbia rose from 11% to 15%.

In contrast, Ontario accounted for 36% of trades employment in 2007, down from 41% in 1987, primarily because of slower employment growth.

Average hourly earnings in 2007 were higher in the trades (\$22.36) than in other occupations (\$21.02) combined, reflecting—in part—the predominance of full-time jobs and the relatively high rate of unionization in the skilled trades. The highest earners were electricians, crane operators and plumbers.

Between 1997 and 2007, employees in the trades saw a 3.5% increase in their average constant dollar hourly earnings, half the 7.4% increase for those outside the trades.

Self-employment is a growing phenomenon among tradespeople. In 1987, 9% of those employed in the trades were self-employed; by 2007, this had increased to 15%. Some trades experienced even higher growth rates, although their self-employment rates had not caught up to the non-trades.

The aging of the population has led to general concerns about the replacement of retiring workers. The ratio of entrants (age 25 to 34) to near-retirees (50 or older) addresses the issue of demographic balance, and shows that the skilled trades had a higher ratio in 2007 than those in other occupations combined (1.0 versus 0.7). This ratio varied among the trades, though, with some having a higher ratio of younger workers (plumbers and masons at about 1.5).

Overall, 17% of workers in the trades were immigrants, lower than the 21% in the non-trades occupations combined. None of the trades had a higher proportion of immigrants than the non-trades. In 2007, 10% of plumbers were immigrants, the lowest proportion.

Osram opens \$30-million T5 manufacturing operation

Versailles, Ky., is the new home of Osram Sylvania's \$30-million manufacturing operation for T5 fluorescent lamps which, says the company, makes it the first T5 lamp producer on the continent.



"Osram Sylvania is proud to bring T5 lamp production to North America," said Charlie Jerabek, Osram's North American president and CEO. "Our investment in this green technology shows that what is good for our environment can also be good for the economy."

Sylvania Pentron T5s are up to 30% more efficient than older T12s and T8s, says Osram, which previously imported the T5s from manufacturing facilities in Europe. The highly automated Kentucky production line employs about 25 people and will produce tens of millions of lamps each year.



B.A. Robinson Co. Ltd. president Ross Robinson performs the official wire-cutting with electrical staff.



Ross Robinson presents the Pontiac Solstice prize to Frank Mutcher of McCaine Electric.

B.A. Robinson celebrates grand opening

Back in November 2008, B.A. Robinson Co. Ltd. celebrated the grand opening of its new electrical HQ/branch in Winnipeg with over 220 guests from the electrical and lighting trades. The evening featured a trade show where over 25 vendors displayed the latest in goods for electrical contractors; food and drink were enjoyed by all, and numerous door prizes were awarded to lucky attendees.

The evening's highlight was the official—not ribbon-cutting—but wire-cutting, followed by the awarding of two grand prizes. John Nunes of ABCO Supply walked away with a trip for two to Arizona, including airfare (sponsored by General Electric), while Frank Mutcher of McCaine Electric won the use of a Pontiac Solstice convertible for three months (sponsored by Schneider Electric).

The building itself is unique in that it was built in the place of an existing structure that was stripped down to its frame and rebuilt to exceed today's standards. The main warehouse floor was rebuilt to be spacious, bright and inviting, allowing customers to easily shop for goods. An upper level was added to house management and staff offices.

In an effort to be as energy-efficient as possible, the warehouse is heated by hundreds of metres of pipe within the floor that carry heated water supplied by two high-efficiency boilers. The warehouse also only employs high-efficiency lighting. The office area is heated via an air source heat pump system.

B.A. Robinson is a fully diversified distributor of electrical, lighting and plumbing products to the construction industry and retail home improvement market in Western Canada. Founded in 1936, the company now operates from 24 locations in British Columbia, Alberta, Saskatchewan, Manitoba and Northwestern Ontario. Congratulations!

MOTORS & DRIVES
www.pamensky.com

WEG & PAMENSKY

Years of Partnership

Variable Frequency Drives & Soft Starters

- Stock of VFD's & Soft Starters up to 500HP
- Stock of motors up to 500HP
- Extended Warranty
- Local Technical Support across Canada

from
PAMENSKY

1-877-PAMENSKY (726-3675)

Bird-Stairs celebrates 50th



Bird-Stairs (J.W. Bird and Co. Ltd.) celebrated 50 years of service to Atlantic Canada in November 2008. Festivities were held in Fredericton, N.B., with Bud Bird—company founder—addressing the crowd to cap things off. Bird-Stairs has six locations throughout Atlantic Canada (Fredericton, Saint John, Moncton, Dartmouth, Halifax and St. John's), and is a member of IED (Independent Electrical Distributors Limited Partnership). Congratulations!



Bodine Peosta plant now fully operational

Bodine Electric Co., a manufacturer of fractional horsepower gearmotors, motors and motor speed controls, says its Peosta, Iowa, plant is fully operational. The "strategic plant consolidation project" more than doubled the size of the company's facility to 140,000 sf,

creating 100 new CNC machining jobs in the process.

"The decision to consolidate both plants was more than just adding manufacturing capacity to our assembly operations," said John Bodine, company president. "This was a strategic decision by the owners and management team that will enable us to further reduce lead times, increase productivity and manufacturing efficiency, and also to contain costs."

The decision to locate all manufacturing under this central-Midwest location will help Bodine to respond more quickly to engineering, prototype and quick turnaround requests, says the company, as it now includes over 60 precision CNC milling, grinding, gear cutting and turning centres.

Cooper Industries acquires Cyme

Cooper Industries Ltd. is acquiring St. Bruno, Que.-based Cyme International, a power engineering software and services provider. Terms of the acquisition were not disclosed.

"This acquisition complements Cooper Power Systems' ability to provide utility customers with comprehensive smart grid solutions to improve power quality, reliability and efficiency in their transmission and distribution networks," said Cooper chair and CEO Kirk S. Hachigian. "Cyme's capabilities in power systems engineering and software development—coupled with our recent acquisitions of Cannon and Cybectec—enable Cooper to provide industry-leading automation solutions and 'smart' products that offer enhanced value to our utility customers."

Philips supports EU incandescent lighting ban



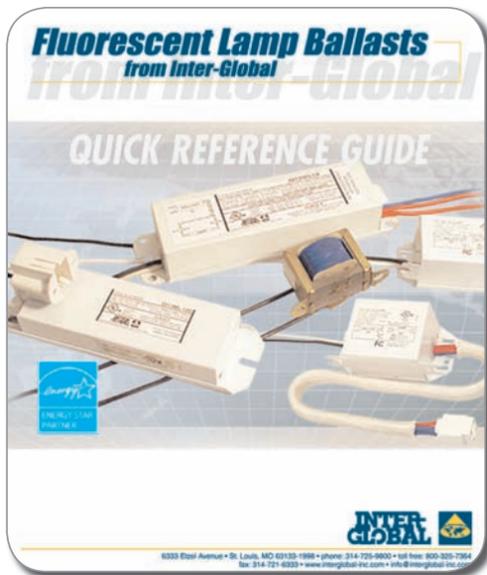
Royal Philips Electronics says it welcomes the European Union's decision to phase-out incandescent light bulbs by 2012, adding it runs parallel

to Philip's call for action to accelerate the switch to energy-efficient lighting solutions in view of climate change.

"Lighting offers a great opportunity to not only significantly reduce energy consumption and carbon emission and, as such, contribute to a better environment, [but] also provides economic benefits," said Rudy Provoost, CEO of Philips Lighting.

The phase-out of incandescent bulbs in Europe will have a significant impact, says Philips: over 1.8 billion incandescents were sold in 2007; their replacement will eliminate 23 million tons of CO₂ emissions annually. **EB**

Inter-Global opens electrical distribution channel



After selling exclusively to OEMs for over 40 years, electrical component manufacturer Inter-Global Inc. has opened several of its product lines to electrical distributors. Ballasts and other fixture components will be available to electrical and lighting distributors as replacement parts for existing fixtures. Both magnetic and electronic products for linear and compact fluorescent lighting will be available. Fixture components include plastic lenses, roofs, grills, photo cells and convenience outlets. "Rare" magnetic open-core and coil ballasts will also be distributed.

For more information, electrical distributors can visit www.interglobal-inc.com (click Distributors).

Tiltran wins contract for Chatham-Kent wind farm

Tiltran Services Inc., in conjunction with its partner, Carlsun Energy Solutions Inc., has been awarded a multi-million-dollar contract with Boralex to construct four 10MW wind farms in the municipality of Chatham-Kent, Ont.

"With these wins, Tiltran has reinforced St. Thomas's [Ontario] position as a significant player in the renewable energy sector," said Brian Hollywood, president and CEO of the St. Thomas Holding Inc. group of companies, the affiliate of Tiltran and wholly owned by the city. "Despite challenging economic times, we have been experiencing a lot of success with green-energy projects and have an excellent reputation in the wind energy marketplace."

The wind farms will be located at Bisnett Line, Front Line, Marsh Line and Swanton Line. Under the contract, Tiltran is responsible for the supply, installation and project management of the wind farms' electrical collector systems.



Ganging up boxes manually for multiple device wall outlets is time consuming and often inefficient. Save time and effort with pre-ganged **BC2304-LHTQ™** steel outlet boxes in 2-, 3- and 4-gang configurations.

Like the original **BC2304-LHTQ** device box, these pre-ganged models are precision welded for superior strength and provide additional capacity to accommodate a greater number of conductors.

What's more, the BC2304-LHTQ-2, BC2304-LHTQ-3 and BC2304-LHTQ-4 incorporate all the patented, time-saving features you've come to expect from original **IBERVILLE® LHTQ** device boxes.

- Positioning guides for drywall and outside wall applications
- Retractable positioning tabs for double drywall
- Internally embossed mounting slots
- Flat box sides for maximum stability and holding prongs
- CSA-approved one-screw mounting up to 2-gang*

Put the **BC2304-LHTQ gang** to work for you. Look for these models at your local participating electrical distributor.

IBERVILLE LHTQ – innovative design and quality manufacturing are a **family affair**.



* Per CEC 12-3010(3), boxes over 4 in. (100 mm) wide require additional support.



Electrical Safety Workshop
IEEE IAS (Industry Applications Society)
February 2-6
 St Louis, Mo.
 Visit ewh.ieee.org/cmte/ias-esw

Annual Technical Conference
Electrical Inspectors Association of Alberta (EIAA)
February 6-7
 Edmonton, Alta.
 Visit www.eiaa2004.com

BC Construction Show
February 11-12
 Vancouver, B.C.
 Visit www.bcconstruct.com

Electrical Learning Expo
Alberta Electrical League (AEL)
February 25
 Edmonton, Alta.
 Visit www.elecleague.ab.ca

National Conference
Canadian Home Builders Association
February 27-March 1
 Quebec City, Que.
 Visit www.chba.ca

The Work Truck Show/Annual Convention
National Truck Equipment Association (NTEA)
March 4-6
 Chicago, Ill.
 Visit www.worktruckshow.com

University of Industrial Distribution
March 8-11
 Indianapolis, Ind.
 Visit www.univid.org

PowerTest Electrical Maintenance and Safety Conference
InterNational Electrical Testing Association (NETA)
March 9-12
 San Antonio, Texas
 Visit www.powertest.org

Networking Luncheon
Ontario Energy Network (OEN)
March 24
 Toronto, Ont.
 Visit www.ontarioenergynetwork.org

Le Salon MCEE
CMEQ, CMMTQ, CIPH, CETAF
April 8-9
 Montreal, Que.
 Visit www.mecanexclimatex.ca

Electrical Industry Conference
Ontario Electrical League (OEL)
April 15-18
 Kingston, Ont.
 Visit www.oel.org

Electrical Safety and Reliability Conference
Professional Electrical Apparatus Recyclers League (PEARL)

April 18-20
 Atlanta, Ga.
 Visit www.pearl1.org

Health & Safety Canada
Industrial Accident and Prevention Association (IAPA)
April 20-22
 Toronto, Ont.
 Visit www.iapa.ca

Lightfair
May 5-7
 New York, N.Y.
 Visit www.lightfair.com

Annual Conference
Supply & Distribution Council (S&D), Electro-Federation Canada (EFC)
May 27-30
 St. John's, Nfld.
 Visit www.electrofed.com

Annual General Meeting
Independent Electrical Distributors (IED)
June 8-10
 Quebec City, Que.
 Visit www.ied.ca

Mid-Canada Electrical Showcase
Manitoba Electrical League
June 17-18
 Winnipeg, Man.
 Visit www.meleague.net

Annual Conference
Electrical Contractors Association of Ontario (ECAO)
June 24-27
 Halifax, N.S.
 Visit www.ecao.org

WorldSkills Calgary
September 1-7
(Actual competition September 2-5)
 Calgary, Alta.
 Visit www.worldskills2009.com

NECA Show
National Electrical Contractors Association (NECA)
September 12-15
 Seattle, Wa.
 Visit www.necaconvention.org

IIDEX/NeoCon Canada Exposition and Conference
ARIDO (Association of Registered Interior Designers of Ontario)
September 24-25
 Toronto, Ont.
 Visit www.iidexneocon.com

Spikeshield® Surge Protective Devices

Do you really want to trust a low cost SPD to protect your expensive equipment?

HUBBELL®
 ...your best Line of Defence

www.hubbellonline.com



VISIT
EBMag.com

and click **Calendar** to see an extensive list of upcoming events.



Pat Lawson

CORRECTION

In EB October 2008, we incorrectly reported that **Pat Lawson**, who joined **The Medgar Lighting Group Inc.**, is currently serving as an executive of the International Interior Design Association (IIDA) committee when, in fact, she's serving as an executive of the **International Illumination Design Awards** (also IIDA)—a committee of the Illuminating Engineering Society of North America (IES).



Chris Curtis

Jean-Pascal Tricoire, chair and CEO of **Schneider Electric**, announced that **Chris Curtis**, president and CEO of the **Schneider Electric NAOD (North American Operating Division)**, will assume managerial responsibility of Schneider's global Building Automation and Renewables business. In addition to his current responsibilities, Curtis is now responsible for developing the global business and complete solutions for Schneider Electric's building segment. A member of the executive committee, Curtis once served as president of Schneider Electric Canada (2002). Meantime, Schneider Electric NAOD has named **Amelia A. Huntington** as both its COO and president of Schneider Electric USA. She will have managerial responsibility for Canada, the United States, Mexico, Juno Lighting Group and several other core division functions and business operations. As COO, Huntington is responsible for leading the management and daily business activities of the NAOD. In other company news, **Thomas Insprucker** has been named director, Global Web Business Program.



Amelia Huntington



Thomas Insprucker

He joins the company's global marketing office to lead the development, coordination and execution of priority Web business programs for both Schneider's customers and its worldwide business units.



Bruce Dean has joined **Arlington Industries** as Canadian national sales manager, where he will manage the Arlington product line—along with the company's six reps in Canada—for the electrical distributor network.

Dean has worked in the electrical industry since 1978, most recently serving as sales manager for Leonard Electric. Prior to that, he spent 16 years with the Westburne organization, holding various sales and marketing positions in the electronic and electrical divisions.



Techspan Industries announced a strategic change to the company's Ontario sales force. Effective right now, it

has changed to an in-house sales staff. Ontario accounts formerly served by **PVE Associates** are now being served by **Chris Hayward**, **Tony Gallo** and **Nadine Kean**. In December 2007, Techspan purchased Hayward Components Inc. (HCI), which is when Hayward was brought into the fold. He possesses over 15 years of electrical and electronic experience, and will focus on Southwestern Ontario. Gallo possesses over 20 years of electrical experience; he's been with the company for five years, and has been handling its OEM accounts for the past few. Knowledgeable in all of the company's product areas, Gallo will handle East GTA (Greater Toronto Area) and Eastern Ontario. Kean, meantime, has been with Techspan for over five years, and was promoted to field sales rep from manager of inside sales. Also very familiar with the company's offerings, she will concentrate on accounts in West GTA and the Golden Horseshoe. Ottawa and Northern Ontario will continue to be serviced by **Phil McLachlen Associates** and **RJD Sales Agency**.

Fluke Electronics Canada has named **ELP Marketing Ltd.**, **ITM Instruments**, **Chess Electric** and **Optimum Energy Products Ltd.** authorized distributors for its line of high-end power quality (PQ) tools, including: 1743, 1744 and 1745 three-phase PQ loggers; 1750 and 1760 three-phase PQ recorders; and Norma high-precision power analyzer. Their regions are as follows: Maritime, ELP; Quebec and Ottawa Valley, ITM; Ontario, Chess; and Western Canada, Optimum. Visit www.flukecanada.ca.



Brian Sorensen

Leviton has promoted **Brian Sorensen** to the position of director of national distribution accounts for the company's commercial data networking business. In his new post, he will direct the strategic growth of Leviton's complete line of voice and data devices, and build relationships with key channel partner and end users. He possesses previous sales experience from his time with Tyco Electronics/DEK and Prestolite/Krone. Meantime, **Jerry Switzer** has been appointed senior product manager, distributed energy management systems, for Lighting Maintenance Systems business, where he will spearhead the development of eco-friendly distributed lighting energy management systems. He previously worked in business development at Hewlett-Packard, and as a senior product marketing manager for GE Security.



Jerry Switzer



Loreto Persichetti

Rob Farrell, construction marketing manager with **Eaton Electrical Group (Canada)**, announced the appointment of **Loreto Persichetti** to product manager, residential products, where he is responsible for driving the success of Cutler-Hammer products in the residential market. Previously, he served as senior sales rep for Eaton, as well as for an HVAC manufacturer and a distributor of automation and process control products. Persichetti holds a diploma in Electrical Engineering Technology from Humber College. In other news, **Kevin Tychkowsky** has been appointed product line manager for the Cutler-Hammer series of low-voltage control assemblies. He most recently served as sales manager for the Southern Alberta area. Tychkowsky is an Electrical Engineering Technologist and a graduate of the Northern Alberta Institute of Technology (NAIT), and is based in Airdrie, Alta.



Kevin Tychkowsky



Stewart Linton

Coleman Cable Inc. has appointed **Stewart Linton** to the newly created position of vice-president, **Coleman Cable Canada**. He possesses management experience in the electrical, plastics distribution and buildings materials manufacturing sectors. In his new role, he will be responsible for the company's wholesale business in Canada.



John Dobson

EGS Electrical Group, a division of **Emerson Industrial Automation**, announced two promotions within its marketing and product development teams. **John Dobson** has been promoted to senior director of Hazardous Location products. Based in Elmira, Ont., Dobson has worked for the company for 21 years in sales and management roles within the Canadian organization. In his new role, he has global responsibility for strategic direction of new product development and management. **Rich Andrew**, meantime, has been appointed lighting product manager for Appleton Lighting, where he's responsible for helping enhance and grow its portfolio of products, and better position it in the global market.



Rich Andrew

PMC Agencies, led by **Paul Champagne**, has been named the exclusive rep in British Columbia for lighting manufacturer Valuelight. The announcement was made by **Bill Charbonneau**, Valuelight's regional sales manager, Western Canada. PMC Agencies can be reached at (604) 644-3781 and pmcagencies@shaw.ca.

Northern Cables Inc.

The armoured cable specialists



Canadian manufacturer specializing in AC90, ACWU90, TECK90, MCTHHN, ACTHH, HCF

P.O. Box 1564, 50 California Avenue, Brockville, Ontario K6V 6E6
 Phone: 613-345-1594 • Fax: 613-345-3147 • Toll Free: 1-888-524-5050
www.northerncables.com

Round Table Participants

Mediator

Anthony Capkun
Editor, Electrical Business

Participants

Bob Nelson
Standards Education & Training
Canadian Standards Association

Daniel Roberts
National Safety Manager
Schneider Electric Canada

John B. Salmon
President/Master Electrician
A.R. Milne Electric Ltd.

Kerry Heid
President
Magna Electric Corp.
(Editorial Advisory Board member,
Electrical Business)

Randall Templeton
Senior Technical Marketing
Specialist—North America
DuPont Personal Protection

Ron Bergeron
President/Owner
Bergeron Electric
(Editorial Advisory Board member,
Electrical Business)

Scott Thompson
Partner
Hicks Morley

Steve Smith
General Manager—Operations
Support
Electrical Safety Authority

Awareness the key to staying alive

An Electrical Business Round Table discussion on electrical safety



Back row, left to right: Steve Smith, Randall Templeton, Kerry Heid, Scott Thompson and John Salmon
Front row, left to right: Daniel Roberts, Bob Nelson and Ron Bergeron

Photos by Jean Héguy

By Anthony Capkun

It was against the backdrop of CSA's Conference Series on Workplace Electrical Safety (2009 CE Code/CSA Z462) that Electrical Business conducted an intimate and informal Round Table discussion on electrical safety over dinner with prominent industry players—all of whom (with the exception of one) were speakers at the conference itself. (You've got to hand it to CSA for bringing all these folks together in the first place.)

The evening's conversation started with a simple question: Why do we continue to work live?

From there the discussion took off in all sorts of directions, lasting several hours and producing volumes of important information. As mediator of the event, I was enthralled and captivated by the assembled brain power and collective years of experience sitting at that table, collecting reams of information. As editor, I was faced with the unpleasant task of trying to distill/trim 19 magazine pages-worth of text into just the two or three you see here.

What you see below is the result of that effort: I endeavored to select the best, most informative sections of conversation from that evening in an effort to convey the importance everyone in the room placed on electrical safety education and awareness.

We look forward to hearing your own comments.



Anthony Capkun: Why do we continue to work live?

John Salmon: I'll open up by saying this: we need to draw a significant line in the sand, and that line starts with live troubleshooting and working on electrical equipment to determine what isn't functioning properly versus changing components live and live tie-in. We learned at this conference that arc flash incidents aren't all that frequent; that the risk of shock is maybe 20 times greater. One of the problems is electricians are prima donnas, thinking they're more robust than they really are. Their perception of risk is skewed.

But I see a great reduction in poor practices. I don't see

people putting bus plugs in live like we used to. (I used to take high-amperage bus plugs, get an aluminum extension ladder and ram them in.) I don't see people tying 30-amp disconnects into splitters like we used to. So some of our extremely dangerous activities are reduced.

There's a lack of training and awareness. I did a lot of unsafe things in the past. That lack of awareness persists in the industry, especially in light of production pressures and customer demands. But you also have some really good customers out there that say, "We don't want energized work, and if you have to work energized, you have to prove to me why". And you have other customers—smaller customers—who say "I can't shut this down. It's going to cost me an arm and a leg. You've got to work energized. If you don't, I'll find someone who will".

Kerry Heid: I agree. Bullying came to mind as one of the reasons we work live... they're forcing you to work energized or they'll call somebody else. Take an oil refinery or something similar: something like that is pretty difficult to shut down, though sometimes the work can be put off until a scheduled shutdown.



John Salmon

John Salmon: Refinery designs are problematic because they were never designed to be shut down in blocks and zones. For my part, we do a lot of zone controls. We did, for example, a brick manufacturing plant. So we put a lot of effort into a controlled shutdown and doing Category 0, one- and two-stop controls, so that we could isolate equipment to a certain extent. We could go into a kind of a sustained Stop, or an Auto Stop.

Ron Bergeron: We have a problem in Ontario. The Ministry of Labour (MOL) has two standards. Electrical contractors are not permitted to work live. All industrial, commercial and institutional (ICI) establishments are permitted to work live by law, so it is done. We contractors are told by our ICI customers to work live: after all, if their staff (most of whom are not electricians) can work live, so can we.

I have lost work because we chose not to work live. In some cases, we did most of the work and the plant electrician did the live terminations in the panel... There is a need for political will, and it's not here in Ontario. Until then, it is an uphill battle.

Bob Nelson: Okay, let's look at the other side of the coin, because I've spent some time with apprentices. I had one apprentice that I know was electrocuted. Why? Because he was too lazy to get off the scaffold. He was doing renovation work, and he just didn't understand or appreciate the hazard. Nobody's trained them. Look at the apprenticeship training in the colleges: there's nothing there on understanding the hazards of working live. All we say to them is "Don't work live". We need to help apprentices understand the hazard and give them some training on working live.

The other problem I see—and a lot of guys complain of—"Where do I shut it off?" For example, they want to work on that receptacle there: where do they go to deenergize it? Where in that receptacle does it tell me where to find the disconnecting means? Nowhere, so what do they do? Change the receptacle live. We've never labelled the end device and there's no requirement to do so.



Randall Templeton

Randall Templeton: At DuPont you've heard of the "Test Before Touch" mantra, where we saw the biggest reduction in accidents. So a lot of the accident reduction that we got was by getting people to test something to verify it was deenergized before working on it. It's one thing to say, "I'm not going to work live", but how do you

prove the power's off? That's where we're getting accidents: where they thought the power was off.

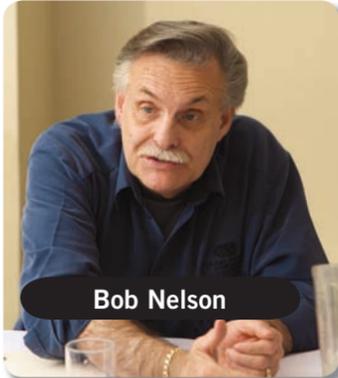
Bob Nelson: I hear your point, but live accidents are occurring because they *know it's live* and don't know where to shut it off. What are they going to do? Short out the receptacle to the box and so trip the breaker? Take a strip mall: the panel is in a locked room. I don't have a key to the room. What am I going to do? And that brings you into bullying, too, because the customer wants it fixed right away. There's no one solution.

Steve Smith: You can't have a good safety program unless the production people believe in it. They will then feel they have a responsibility to look out for their fellow workers. If they think that safety is a "safety guy's" problem, then it's not going to work.

John Salmon: That's the interdependent culture you have to develop.

Kerry Heid: Has anybody ever tried getting someone senior at a company to sign an energized work permit—you know, in case you get killed? I tried that in Western Canada—I

won't name the company—but they swore there was no way to turn off this one particular panel to put in a 400-amp breaker. Couldn't do it. Absolutely impossible. So we did an arc flash hazard analysis and a complete risk assessment—the whole nine yards. Later, when we sat down in a room and asked their vice-president to sign the energized work permit—you know, just in case we miscalculated, one of the engineers made a mistake, someone drops a screwdriver, or someone gets burnt or killed—it didn't take him 10 seconds to say, "Oh, well, we could just run a temporary wire from that floor to this floor".



Bob Nelson

Bob Nelson: I agree that you need to look to the higher ups, but I also think you need to start at the lower levels. Because the guy coming out of trade school has no training. Nothing. I think we need to start at both levels. We've all worked live, or most of us have, and where did we learn it? We watched

somebody else do it. From a journeyman. Did he use the right methods? No. So we need to both look at the young guys and the heads and higher ups. I can't see it just going to one level.

Steve Smith: One of the things I see is that, in our North American culture, most people know that, when you're dealing with voltage, you can get shocked. Everyone kind of gets that. What I don't think they appreciate is that when you deal with amperage you can get burned from an arc blast, even though the voltage may be low. We need to help change the culture that recognizes high voltage as a shock hazard but hasn't recognized that a low-voltage, high-amperage fault is a definite burn hazard.

John Salmon: But we can control electrical contact first with the glove program, because we have far more exposure to shock than we do to arc flash. When you have a really good, solid shock program that you're starting to implement, your arc flash program becomes an easier sell. Getting my own guys to wear gloves was a one-year program. It took positive and negative feedback, coaching, slapping—even buying monogrammed bags with their names on them. Oh, and making them pay 20 bucks for their gloves.



Ron Bergeron

Ron Bergeron: It takes a long time for the older guys to unlearn. I would like to see more in the apprenticeship training. In all the schooling they get, they don't get a stitch of safety. We have a cultural problem in North America. The box stores, like Home Depot, reinforce the mentality that electricity is benign.

Steve Smith: I always say that most codes and standards are written in blood. So, unfortunately, it usually isn't until these things happen that we institute code changes. Every rule in the code—with the exception of maybe two—are the result of misfortune. There's a reason for every rule in there. It's either a fire or it's a shock issue and, unfortunately, most of changes are as a result of someone dying or getting hurt.

Anthony Capkun: Now if we put this conversation against the backdrop of CSA Z462, how do we further the cause of education... not necessarily among electrical contractors and their crews, but among upper management, executive types? Will it make a difference?

Steve Smith: When I started in the trade, you were considered a wimp if you asked for hearing protection. Back then, I used to wet a paper towel and put pieces in my ears for hearing protection. I would then cover my ears with my long hair because I didn't want to be embarrassed. And now people think nothing of wearing hearing protection, so we will get there, along with all the other safety measures.

Why is it acceptable that we put men's and women's lives on the line? In what other profession is this acceptable? So we have to change that culture, and it starts with discussions like this. The easiest way around Z462—though I hate to say it that way—is to simply deenergize.

Daniel Roberts: A common misconception is that Z462 is the "energized work standard" [or] "arc flash standard", but it is anything but. The primary focus of Z462 is to deenergize before beginning work... how to properly deenergize, and the PPE necessary while deenergizing. Anthony, you mentioned guys complaining about wearing gloves and not being able to do their work. Well, they're not supposed to do that kind of work while equipment is energized.

As to your question about what Z462 will do, the fact is that there's now a huge awareness that there's something coming. There's a new regulation that spells out best practises. There's a heightened awareness in the electrical community. They know something's coming; they want to know what it is, what they have to do, what's different. This is going to make everyone work safer.

Anthony Capkun: Scott, is it fair to say that—at least in a court of law—Z462 would carry weight?



Scott Thompson

Scott Thompson: Well, the test is ultimately when you're facing a charge under occupational health and safety legislation; the Crown has to prove that there's been a breach of the code, then the contractor/employer has to demonstrate he did everything reasonable under the circumstances. So if he's been following an industry standard like Z462, then that's

certainly evidence he's doing what's reasonable. The employer may have even taken a higher standard or a different approach, but if he's completely unaware of the standard...

John Salmon: ... then it doesn't bode well for him.

Scott Thompson: ... it doesn't bode well for him. If you're an employer and you know your workers are not complying with your safety standards, then you're at risk. You should be doing something. You need to conduct audits to satisfy yourself that they are complying. The example I use in the electrical context is that when the foreman walks into a room and notices a new piece of conduct and wire going into the panel and there's been no shutdown, then somebody's been working live. You should, as an employer, conduct an investigation to find out who worked live and why, then they should be reprimanded and the whole procedure documented. That doesn't happen nearly as much as it should.

John Salmon: Well, because they're buddies. When I go play ball with my guys on the weekend, what am I going to do, reprimand them?

Scott Thompson: For years I've talked about progressive discipline in health and safety, and I run into this barrier that "We don't rat on our buddies", and that's a huge part of the culture problem that exists below the management level. It's fair to say that most electrical contractors have a policy of not working live, but the question is what do they do when it happens underneath that policy. What process do they have in place?

Anthony Capkun: Now what remains to be done? What out there in the market still needs to be improved? What isn't working? Also, what about the design team; the architects and engineers? Are electrical rooms even being designed to allow for minimum safe distances?

John Salmon: I think proactive enforcement could be stepped up as opposed to waiting for injuries and fines, but the ministry is largely an enforcement entity that charges after the fact. I don't think that's going to change.

Kerry Heid: Yes, It would be nice if the ministry—instead of showing up after there's been an accident—showed up and coached. You know, a friendly visit where they come along

and say, “Regulations say this. Have you heard about Z462? Look at implementing this, and we’ll be back next month and see how you’re doing”.

Bob Nelson: One of the things I get concerned about, and I see it all the time, is existing electrical installations being used as offices or storage space and all sorts of other things. The number one thing we need is more room inside panels and electrical rooms. They’re too tight. The electrical room is considered non-productive space, even though without it you have no production—it’s not going to make anyone any money, so developers are not going to give us any more space than they physically have to. When needs change, you cram more equipment into the same space.

If we don’t have the space to do our work then we can’t maintain the equipment and that’s the main reason we need a maintenance standard; because if we’re going to make it safer for the workers for arc flash, we have got to make sure that those breakers are maintained. That means we have to be able to get at that equipment and not move a whole bunch of crap out of the way just to get at it [but] it’s just not happening out there.



Steve Smith

Steve Smith: It’s pretty frustrating to go into an industrial mall and see the joint uses of electrical rooms. I earlier referred to a near-fatal accident at a donut shop where the lady’s office was the electrical room. She dropped her keys down the back of a transformer, so she took the cover off the transformer and stuck her arm through the windings to get the keys. In other retail areas you get people piling stock on top of transformers. Another example I referenced was finding a purse inside a 600-volt splitter. When we asked the lady what she was doing, she explained she “just wanted to keep her purse hidden and safe”.

John Salmon: Those consoles are full of magazines all the time.

Steve Smith: The point I’m trying to make here is that perhaps the rules need to be tightened so they don’t allow joint usage of electrical rooms. If this is such a big potential hazard, then why are we letting normal people sit right beside transformers and switches and the like?



Daniel Roberts

Daniel Roberts: The industry’s attitude is slowly changing. Let me tell a story on that. I received a request from a large multinational corporation (a customer of ours) to come in and explain what “all this no working live stuff” was about. They wanted to know

why many of their electrical contractors were now refusing to install and connect circuit breakers in live panelboards. So I went in and explained, frankly, there’s nothing new. This is what the regulations have said all along, only now there is increased enforcement and awareness, and that this is the way people are beginning to operate. They asked a couple of questions and then thanked me for coming.

John Salmon: And they’re still going to hook up live?

Daniel Roberts: No. A few months later, they called me back, and I thought I was going to have to explain everything all over again. However, based on what I had told them earlier, they had decided to not allow energized work any more. This was their decision—I just put the facts before them. Their only remaining concern was what to do when a contractor came in that was still working ‘old school’.

So things are changing because of the cumulative effect of all these things coming together at once, like in the

movie “A Perfect Storm”. For years, ESA has been talking about different facets of electrical safety. That’s one angle. You’ve got kids coming out of school with a little bit more awareness than previous generations. You’ve got larger corporations stepping up to the plate and being proactive, and increased enforcement from the ministry. So you’ve got all of these things happening. Now we get CSA Z462 in Canada.

Bob Nelson: But don’t you think the key is still more awareness. We can’t say, “Okay, Z462 is now out there”, and back off. We still have to deliver the message.

Daniel Roberts: Yes, I think we do, because unsafe acts are not culturally acceptable. Look at the shift in so many areas in society with, for example, smoking. Where at one time you smoked everywhere, now you’re a pariah if you smoke. Or seatbelts. Now they’re second nature. But to Bob’s point, yes, the key is awareness. It’s the safe work practises that are put into place.

Anthony Capkun: Now, in conclusion, I’d like to go around the room and get some last thoughts from everyone.

Steve Smith: I think before we can make any change that will be embraced by industry, we’ve got to think about—what was the term—progressive discipline. I like that approach. I mean, we’ve got to be careful that we don’t try to eat the elephant all at once. It should be done in stages to get people to change the culture of the industry. And it will happen, if we push the “ship” in this direction. But remember, ships can take a long time to turn. We’ve got some big changes coming down this year, like the 2009 code and Z462, and I only hope it’s not too much, too fast. I know we’re anxious to get to zero, but we have got to be careful along the way to make sure that they all get accepted by the industry [which is given] time to adjust.

John Salmon: Meetings like this will help advance awareness. I learned a lot tonight. There is a lot of expertise around this table and, certainly, I agree with Steve that you need to take steps incrementally. You need to try to roll these programs out. You need to get the right message out of what we’re actually trying to do; it’s not about adding a huge cost burden to industry, or just more Ontario with its over-regulated programs, etc. So to make something like this happen, we need to keep facilitating it through CSA, and have ESA, the Ministry of Labour and private entities and manufacturers all work together toward the common goal of zero injury. Let’s take it a step at a time.

Bob Nelson: I guess I’m not as concerned about the new code coming out and the changes because the industry’s used to the code changing. We’ve been living that rule for a number of years. So they’re used to gearing up with the changes that are coming. Workplace electrical safety is the area we need to look at. We need to raise awareness for the young workers coming out of school and going into the field. We have a lot of young guys taking summer jobs getting hurt. We may need to take that awareness from the college level and start introducing it at the secondary school level.

Then we need to raise awareness among the older guys; tell them, “Hey, this is what needs to be done”. Make them aware, give them the reasons and then, as we said before, we’ve got to look at upper management. Explain to them that this is the cost of doing business; that you’re going to have to schedule production downtime for some work to get done. And why stop there? We should get spouses involved, too. Once they’re aware of the hazards, they’ll put pressure on their husbands/wives to work safely. I agree it’s not going to happen overnight, but we need to keep the pressure on.

Scott Thompson: Awareness is a huge point, but there are two mindsets we have to tackle. In the first group there are all those people who know nothing about electricity and have no real understanding of working live or its consequences ... the factory owners and most of the population. If the dangers posed by working live were explained to them, I think you would find them saying, “No, there has got to be another way”.

The other mindset belongs to those who have the knowledge but don’t fully appreciate the consequences, thinking,

“I can do it”. It would be very interesting if we could find out what percentage of live incidents are the result of people knowingly working live or someone just having an inadvertent contact.

Daniel Roberts: The common theme here is awareness, awareness, awareness, and I suggest a three-pronged approach. One, we’ve got the people that are the feet on the street: that’s ESA, Ministry of Labour, BC Safety Authority, etc. We need to make them aware of CSA Z462. Two, we need to get it into the apprentice’s curriculum. That’s very important. And three, there’s conferences like this one, and discussions like this Round Table.

Workers need to be educated and that’s an employer’s duty. Employers need to be educated and enforcement people need to be educated. Is it overkill? I don’t think so, because there’s nothing new in CSA Z462... pretty much anything you pull out of Z462 is already a requirement in a regulation somewhere. We’re not really expecting people to do anything new. Besides, NFPA 70E has been in people’s minds for several years, so all this should be old news.



Kerry Heid

Kerry Heid: Yes, I want to echo the multi-level awareness that really needs to happen. And further to awareness is better understanding, because there are a lot of misconceptions, especially about Z462. There’s a whole variety of people—from owners and apprentices to inspectors, regulators and designers—that need greater awareness and better understanding.

Bob Nelson: And we’ve got to come up with something the electrical contractor can give his guys. Not necessarily how to calculate the fault current and the category, but something down and dirty that makes sense to his crew and helps him stay legally covered.

Randall Templeton: I was just thinking about some of the challenges we’ve discussed here, and one of struggles we have is using electricity; it’s everywhere and we take it for granted. Compare that with some of the other processes we deal with: you would have a very different attitude were this room full of pipes carrying gasoline under pressure. We would take a lot of precautions, but we don’t have the same respect for electricity. That’s a challenge right there. The other thing about electrical hazards is they’re not like other recordable incidents, like simple cuts to eye injuries and crushed toes. If you get a shock or are blasted by an arc flash from a high-energy circuit, you may be killed. The consequences are catastrophic, which is why it requires the hazard analysis some of us are really pushing—that’s the only way to deal with it. You can’t say we’re getting better because our recordables are going down; it’s simply not a reasonable approach for electrical hazards. The culture in our industry needs to change around this.

People that are responsible for the productivity of an operation have to believe that performing the operation safely is part of the job. If they don’t accept that, then their activities aren’t really going to be effective. Systems thinking is very important. We’ve got to do more than just recommend the right PPE, or suggest how to do proper grounding and walk away. We’ve got to do everything we can to cultivate the right attitude. We’ve got to have the right engineering, the right work practices, the right PPE, etc. All of these things have to be in place. If you rely on any one of those things on its own, it won’t be enough.

I would be remiss if I didn’t mention the tremendous benefit derived from the interaction of safety professionals with electrical experts. A lot of important things can be achieved when the two fields collaborate.

Ron Bergeron: There is hand-wringing about where we are in electrical safety. I started in construction in the summer of 1970. At the time, the safety rules seemed fine, but when I look back, I shudder at how bad they were. We have come a long way and should be proud of our accomplishments while recognizing that, although we’re on the right track, there’s still a long way to go. 



Luckily, you don't need any permits to renovate your bottom line.

When it's your business, you can't be satisfied with 'good enough.' In your workmanship or your finances. A Scotia Small Business Advisor can help you find ways to improve your bottom line and grow your business. And the **Scotia Blueprint for business™ Check-Up** is a diagnostic tool that can help find money 'hidden' in your business. Try it today at skilledtrades.scotiabank.com or visit your nearest Scotiabank branch.

Small Business Banking

You're richer than you think.®



Using engineering technology to minimize arc flash hazard

By Andrew Cochran

Although arc flash hazards have existed since man began using electricity, increasing deaths, injuries and property loss from arcing faults have led to increased awareness of the issue and investigation into methods of protection.

Statistics compiled by CapSchell Inc. (a Chicago, Ill.-based research and consulting firm specializing in preventing workplace injuries and deaths) reveal that five to 10 arc flash explosions resulting in medical treatment occur in electric equipment every day.

An arc flash is the breakdown of the air, resulting in an arc that can occur where there is sufficient voltage in an electrical system and a path to ground, neutral or another phase. With a high level of current (in the range of 1000 amps or more), an arc flash can cause substantial damage. The massive energy released in an arcing fault can instantly vaporize metal in the path of the arc, blasting molten metal and expanding plasma outward with extreme force. The result of the violent event can cause destruction of equipment, fire and injury—not only to the person to working on the equipment but to others in proximity.

The engineering approach toward minimizing the arc flash hazard involves controlling/containing the contributing factors, which are: amount of arcing current; the time that it flows; and the distance of the worker from the arc itself. The first two of these three factors can easily be minimized during the design of the electrical system.

Current-limiting devices

Current-limiting fuses and circuit breakers are often used in the design of electrical distribution systems to protect electrical equipment under high available short-circuit conditions. They are able to protect the equipment from the significant thermal damage and magnetic forces associated with high short-circuit currents by actually reducing the current that flows and the time that it flows. Within their current-limiting range, they keep the current from reaching its peak during the first half-cycle.

And because they can react so quickly, the current is driven to zero in as little as a quarter-cycle, or less. This great reduction in damaging current and time not only protects equipment from significant short-circuit currents but, naturally, also protects workers that might be exposed to horrendous arc flash energies. The difference between a 30,000-ampere arcing fault that lasts for 30 cycles and a let-through arcing current of 1000 amperes that lasts for a quarter-

cycle can make the difference between a worker driving himself home, or being taken to the morgue.

In practise, the majority of electrical faults experienced in industrial low-voltage systems are phase-to-ground faults. For solidly grounded wye systems, the IEEE Red Book (141-1993, Section 7.2.4) states: “A safety hazard exists for solidly grounded systems from the severe flash, arc burning, and blast hazard from any phase-to-ground fault”. The same standard recommends a solution for resolving this issue: Section 7.2.2 says that when using high-resistance grounding, “there is no arc flash hazard as there is with solidly grounded systems, since the fault current is limited to approximately 5 A.” (The Red Book is referring to phase-to-ground faults.)

While high-resistance grounding prevents the propagation of many ground faults into fully fledged three-phase arcing faults, it has no effect on the magnitude of a phase-to-phase or three-phase arcing fault once initiated. As a technology, high-resistance grounding was originally applied to industries as diverse as food processing, mining and petrochemical, and even commercial installations (such as airports, data centres, etc.) to enhance the reliability of power distribution equipment, but it was also discovered to be quite effective at reducing the frequency and severity of arc flash accidents.

With between 90% and 98% of electrical faults being phase-to-ground faults, limiting fault current to between five and 10 amps means there’s insufficient fault energy for the arc to re-strike; it self-extinguishes and hazard frequency is reduced.

Nowadays, high-resistance grounding is being used to replace solidly grounded systems for the safety reason noted, but there are design considerations to address. Fortunately, modern technology helps incorporate these considerations, making the design process straightforward.

The original high-resistance grounding system developed in the 1950s and 1960s worked as intended; however, it wasn’t able to solve potential safety issues, such as a second ground fault, leaving the ground on the system too long, communications, additional tools for locating a ground fault, and monitoring the neutral path.

When modern relays are integrated into the high-resistance grounding package, these design considerations are easily resolved. The addition of zero-sequence current transformers on each feeder in the main switchgear and a dedicated ground detection system are all that is required.

These can be integrated into new switchgear or retrofitted into existing gear. When a ground fault occurs, the ground relay indicates faulted phase and feeder. This keeps maintenance personnel away from the main switchgear when looking for the ground fault, often allowing them to wear lower-rated PPE (personal protective equipment). The reason is that personnel will begin looking for the ground fault downstream of main switchgear, where the arc flash hazard is based on the feeder overcurrent protection device (where arc flash energies are often lower) and not the main overcurrent protection (where arc flash energies are often higher).

In addition, the relay has built-in communications to alert personnel when they are not onsite during ground fault. The data logging system will keep track of ground faults until maintenance personnel have a chance to locate them. This may help associate the ground fault with a faulted piece of equipment by coordinating time/day of the occurrence when equipment is running.

There is a concern that the first ground will be left on the system and ignored. Since the zero-sequence current transformers identify the faulted feeder, the relay has the ability to begin a timer (user-programmable, usually in hours) when the ground fault first occurs. Unless the ground fault is removed or the timer reset, the faulted feeder is shunt-tripped offline. The purpose is to continually remind maintenance personnel to either remove the ground fault or to reset the timer every so often.

In the event that a second ground fault occurs prior to removing the first, a phase-to-ground-to-phase or phase-to-phase fault can occur. When this occurred on original high-resistance grounded systems, it would cause both feeder circuit breakers—and possibly the main circuit breaker—to trip. However, the modern relay can be programmed to prevent this, and only shunt-trip the lesser-priority feeder, leaving the more important feeder online.

A major safety concern is the loss of neutral path (i.e. broken wire from source neutral to resistor or between resistor and ground, or even a bad or loose connection). The result is changing from a highly resistive grounded system to either an ungrounded or solidly grounded system without anyone knowing. This would cause severe safety hazards. With modern technology, the neutral path from neutral-to-ground (including resistor) can be continuously monitored for integrity. Should an open or short circuit occur, the relay will alarm.

High-resistance grounding systems do not protect against less-frequent—though still dangerous—phase-to phase or three-phase arcing faults. However, with its ability to prohibit the escalation of the fault, combining high-resistance grounding with current-limiting fuses/circuit breakers (for phase-to-phase and three-phase arcing faults) is an effective engineering approach to minimizing the arc flash hazard. 

Andrew Cochran is the president of I-Gard Corp., which offers a full line of neutral grounding resistors, ground fault protection systems and power-resistor-based solutions for power protection. Its solutions are employed by a variety of OEMs, including ABB, Eaton, General Electric, Schneider and Siemens. Cochran can be reached at acochran@i-gard.com.

Now from Hammond Manufacturing

ENCLOSURE COST SAVINGS

Virtually every standard industrial enclosure needs to be modified by your staff for final use - holes, cutouts, painting, and more. Hammond Manufacturing can affordably provide ready to use enclosures to your specifications, saving you this additional labour time and cost.



Your Colours



Your Holes & Cutouts



Your Mounting Requirements



Your Dimensional Needs

Modification services:

- Durable Powdercoat Paint Colours - Hammond standards, RAL and custom colour matching
- Laser/CNC Holes & Cutouts - conduit openings, pushbutton holes, equipment cutouts, etc.
- Mounting options - various studs, strut, tapped holes, etc.
- Dimensional changes
- Accessory assembly - windows, handles, lighting, climate control, etc.

Contact your Hammond Distributor or visit us online at www.hammondmfg.com for all your enclosure needs.



HAMMOND MANUFACTURING™

Hammond Manufacturing Co. Ltd
394 Edinburgh Road North
Guelph, Ontario N1H 1E5

Tel: (519) 822-2960 or (905) 456-3770
Fax: (519) 822-0715
sales@hammfg.com
www.hammondmfg.com

Quality Canadian Products 

LOOKING TO GET MORE **PLAY** FROM YOUR ELECTRICAL PURCHASES?



It's easy to turn your purchases into cool stuff.

Leisure, entertainment and office rewards are all within your reach with IED Rewards. There's a powerful lineup of products to choose from – tools for the workshop, the latest gadgets and electronics for the home and unique items that are a collector's dream.

The program is simple. We reward our customers for purchasing participating suppliers' products from an IED Distributor. You earn one point for every dollar spent⁽¹⁾ at any IED Distributors⁽²⁾ across Canada. Your points are updated monthly and you can begin receiving rewards for as little as 1500 points⁽³⁾. What could be easier?

To enroll, log on to www.iedrewards.ca, click on register and then follow the prompts.

Sign up with the IED Rewards Program today. You'll be amazed at what your purchases can become.

(1) Points earned on purchases from participating IED Distributors and participating suppliers only. (2) Rules on website apply. (3) Points can be converted to charitable donations to ensure compliance with individual corporate policies.

TURN ON TO REWARDS.



www.iedrewards.ca

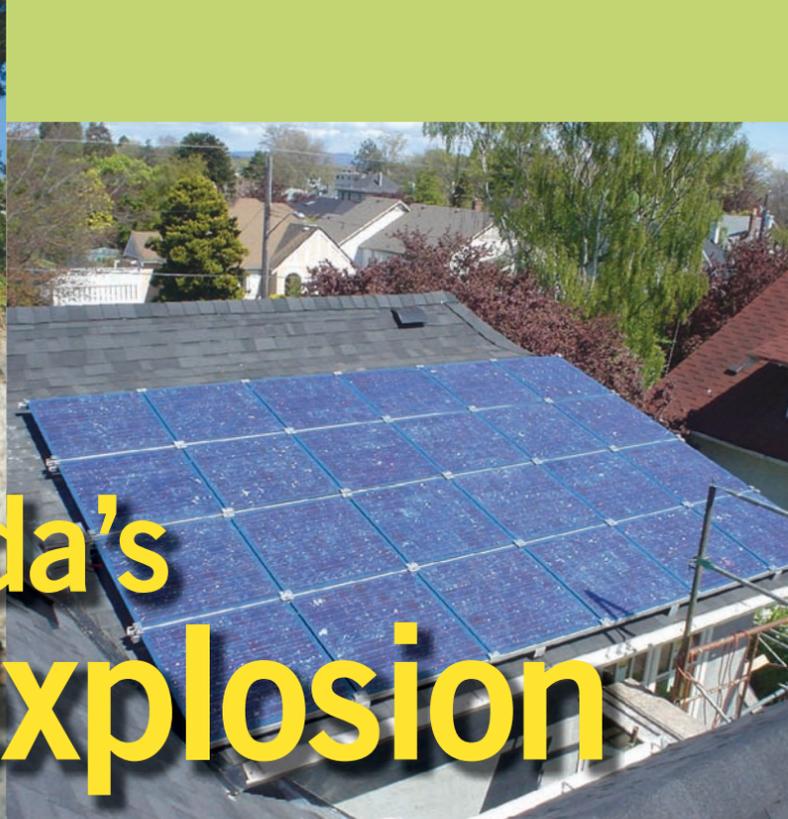


IED LIMITED PARTNERSHIP II • WWW.IED.CA

CANADA'S LEADING ELECTRICAL SUPPLY NETWORK

Visit www.ied.ca for the IED distributor nearest you.

Beaulieu & Lamoureux • CDE • Del's Distributors • Deschênes & Fils • Diversified Ventures • Dixon Electric • Dubo Électrique
Eddy Group • Eecol Electric • Electrimat Ltée • Espo Electric • Grey-Bruce Electric • Hesco Electric Depot • House of Electrical • J.D. Paré
J.W. Bird • Marchand Electrical • McLoughlan Supplies • P. Wolf Lighting • Les Distributeurs Papineau • Paul Wolf/Kester • E.G. Penner
Powmatic • Province Electric • Robertson Electric • Tesco Electric • Thornes/Source Atlantic • Tradelco Inc. • Western Equipment



Be a part of Canada's solar power explosion

Learn to install and, especially, learn to sell

By David Egles

You can't miss it: solar electricity is everywhere! Those flashing construction signs on the side of the highway, pay kiosks in parking lots, blinking crosswalk signals—even bus shelters—are using the sun as their power source. All across Canada, megawatts of solar panels are busy producing electricity to run equipment, power homes and add power to the grid.

This silent explosion began in the late 1980s when the first commercial solar panels became readily available. This new technology—called photovoltaics (PV)—used silicon solar cells to convert sunlight to direct current. Although efficiency was low (around 10%), PV panels had no moving parts, so they lasted 25 years or more. Even though PV was expensive (about \$20/watt), there were still numerous applications, such as navigation buoys, mountaintop radio sites and cottages with generators.

Thankfully, the price of PV has dropped by over 500% since 1988, and the industry is booming. With panel prices down to \$4/W and efficiencies over 16%, the solar electric industry grew to become a \$17 billion US global industry in 2007. In Canada, PV installations generated over \$50 million in revenue in an industry employing over 1370 people. With installations growing at 25% per year over the past 10 years—and 36% over the past five—solar electric power promises to become a significant source of clean electricity in Canada.

But can solar get a true foothold in Canada? It definitely makes sense in other countries that aren't nearly as energy-rich as Canada; countries with real energy reliability concerns. Are we merely riding the solar wave that started in Japan and crossed Europe?

Despite our relatively low electricity costs and abundance of hydro-generated electricity, solar still makes a strong case in Canada. Electrical demand is growing 2% annually; that supply has got to come from somewhere. Add greenhouse gas concerns into the mix—as well as rising electricity costs, peak load pricing, tiered rates, etc.—and you can see how the case for solar only gets stronger. No, the solar boom is not, in fact, a fad. *It's a transition!*

What is grid-tie solar?

Traditionally, PV panels have been used in off-grid homes, for remote power at industrial sites, and on RVs and boats. However, a really exciting market for most installers is the grid-tie market; installing solar electric power on homes and businesses that are connected to the utility. Although this represents only 25% of the current annual market of 5 MW, the sector promises to eclipse off-grid solar applications within a few years.

Solar systems are appearing on suburban homes, schools and businesses. Typically mounted on the roof, these systems feed electricity into the load panel whenever the sun shines. Where the local utility has net metering, customers can sell their excess electricity to the utility. Ontario, for example, pays \$0.42/kWh for solar electricity; BC Hydro has over 50 customers feeding electricity back into the grid.

A rooftop solar grid-tie system is a simple yet beautiful thing. It produces power every day, converting 15% or more

of the incoming solar energy into DC power. An inverter converts this DC power to alternating current, then synchronizes it with the 120/240vac supplied by the utility.

Solar panels are rated in watts based on their output in bright sun conditions. A kilowatt of solar panels take up roughly 100 sf on a roof and, in most places in Canada, will produce between 1000-1350 kWh per year. Solar electric panels require virtually no maintenance and are typically warranted for 25 years.

The costs of solar electricity

With current system installed costs of \$10-\$12/watt and a 30-year life span, solar electric power is still more expensive than buying kilowatts from the utility. Simple cost calculations show that solar electricity costs about \$0.30/kWh.

But utility electricity costs are always rising (5%/year in the States) while solar costs continue to fall (also 5%/year), so the economics are changing fast. There's no question that solar electricity will reach either grid parity or direct competitiveness with retail electricity prices. In fact, many states and countries have already reached grid parity pricing. Here, PV grid parity is expected by the end of next decade, and even sooner with incentive programs like those offered in Ontario.

Where is the market for grid-tie solar?

While solar electricity is currently more expensive than coal, nuclear or natural gas electricity, the global financial markets have invested tens of billions of dollars in the industry over the past five years. In 2007, grid-tie represented 25% of the total Canadian market, or 1325 kW of installations. Commercial installations involving LEED (Leadership in Energy and Environmental Design) account for a good portion of this, but residential installations are one of the fastest-growing sectors.

Who are the customers for residential grid-tie systems? People like the Feldmanns, who run a successful physiotherapy business and live on several acres next to a lake just outside an interior British Columbia town. Their home is a typical Canadian home (complete with a teenager), yet they produce about 25% of their own electricity.

A big concern for them is power failures, which is why their system includes a battery backup. By conserving energy, the Feldmanns can run their house for weeks or more on a combination of solar power and batteries. In fact, the first of the winter power failures happened just last week. Writes Juerg Feldmann: "There was a power outage two days ago and we wouldn't have noticed except that my neighbour told me they had no power".

Then there's the system in my family home. It has 2 kW of PV, though you'll have to look hard to find it. It rests on top of a 16 x 16-ft roof over the ensuite. The house participates in BC Hydro's Net Metering program, so when the house produces more electricity than it uses, the excess electricity is sent back to BC Hydro for credit. This is a straight grid-tie system without backup. These systems are simpler and less costly than adding a backup module, and ideal where power is more reliable.





3. Connect the solar panels together. Solar panels have mating plug in connectors. Plug and play!
4. Bring the solar panel output cables to a combiner box, and connect to the DC feed cable.
5. Lead the DC feed cable down to the inverter, typically in the electrical room.
6. Connect the inverter to load panel. Some jurisdictions require an exterior inverter shut-off switch.
7. Turn it on and start producing power.

A 2.4 kW grid-tie system takes about five man-days to install. Variables to consider are the roof slope and materials, how the power cables are led through the home, and where the equipment is located.

The solar electrician needs to work with DC voltages of up to 450, wiring solar panels in series and parallel as a high-voltage input to inverters. Solar panels have quick connect cables, outdoor-rated male and female plugs that join the individual panels to form a sub-array. Sub-arrays join together in combiner boxes to a main DC feed cable—a conventional cable led through conduit to the inverter.

The rules about installing solar electric systems are established by the local utility and Section 50 in the CEC. It is likely that Canada will design a national certification program for installers, building the specific skills needed to properly design and install systems.

Certainly, the electric trades will be involved. CanSIA (Canadian Solar Industries Association) offers training programs all over the country, but certification programs are a few years away.

Solar taking over?

It's not just conceivable but very likely that solar systems on residential roofs will be commonplace in 10 years, and that every home will have one in 20—just like thermal windows and insulation. Solar electricity is reliable, will ultimately be cheaper than other energy sources, and will help Canada be more energy self-sufficient and environmentally responsible.

The electrical industry can help accelerate the mainstreaming of solar power by learning more about it and promoting it to clients. The companies that establish themselves now will have an advantage over latecomers, both in experience and reputation. **EB**

David Egles is a 25-year veteran of the photovoltaics industry and has over 20 published papers in this field. He has a B.Sc. in Physics and an M.Sc. in Physical Oceanography, and currently chairs the board of the Canadian Solar Industries Association (CanSIA). He is the founder of both Soltek Solar Energy (1988) and Home Energy Solutions (2007). Egles' expertise is in renewable energy, with a focus on technical and policy issues of solar electric power, in both off/on-grid applications. He can be reached at degles@heshomeenergy.com. More information can be found at www.cansia.ca or www.heshomeenergy.com.

How contractors can get involved

Like any business, there are two things electrical contractors need to do to participate in the solar boom: sell and install.

Selling is the hard part: this is still a new field, so customer education is a must. Much like home automation systems, personal contact with a home owner is required to scope the project and determine the right solar solution.

Helping customers make decisions is easier when systems are quoted as complete packages, and you limit the number of packages. The main options are whether to add battery backup and what size. After a number of installs, contractors can fairly accurately estimate installation costs.

Installing is what most electricians are best at. Here's what is involved:

1. Locate the solar array. Roofs are most common; pole or ground mounting second.
2. Fix the solar array to mounting brackets. These usually come as part of the package.

Fast solar electric facts

- In 1997, 3380 kW of solar electric systems were generating power in Canada. This grew to 25,775 kW by 2007, with an average annual growth of 26% since 2003.
- Installations were 5190 kW in 2007, roughly \$50 million in business. Installation rates have grown by 36% per year since 2002.
- Solar panel prices have fallen an average of 10% per year since 2000.
- 46% of Canada's residential power consumption (115 TWh) could be supplied by roof-mounted residential solar power systems. There is enough roof space for 52 GW of PV panels today.
- The average Canadian home uses just over 10,000 kWh of electricity per year. A 9kW solar system would supply 100% of the electrical needs of a typical home on an annual basis.
- Solar panels today produce between 100-170 watts per square metre. There are a variety of technologies out there, but silicon solar cells predominate.
- To produce 1 kW of solar energy in full sun, or 1100 kWh per year, a solar array would be between 6 m² and 9 m², depending on the technology used. The 9 kW array described above would be between 54 m² and 81 m².
- If an area equivalent to the size of the city of Victoria was covered with solar panels, it would generate enough energy to supply the entire province's electrical needs of 60 TWh.
- Germany installed 1135 MW of photovoltaics in 2007—sufficient generating capacity to provide 10% of Canada's incremental electrical resource in 2009, or more than 1 TWh of electricity.
- 10% of Canada's new electricity needs in 2009 could be met with solar systems installed on 5% of available commercial or 2% available residential roof spaces.
- Grid parity pricing for solar power is expected by mid-next decade in most of the United States, and the end of the decade in Canada. Support programs may shorten this by helping market development and promoting investment.
- Photovoltaic systems last for 25 years or more.



ExpressLine HUBBELL

CASH BACK

\$1 to \$3 on great Hubbell products!

GET YOUR CASH BACK!
www.GYCB.ca
OBTENEZ VOTRE REMISE!



Hubbell Lighting's ExpressLine family
Value & Service for you!

Ask us for details or go to
www.GYCB.ca
for more details.



HUBBELL CANADA LP
Lighting Division
870 Brock Road South
Pickering, ON L1W 1Z8
(905) 839-1138



LIGHTING, INC.



A litany of limbs

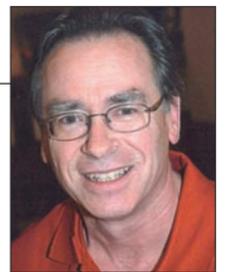
All I could think about was my wife and kids, and how I didn't want to die.

Back in October, I told you about a friend of mine, Curt, who had just left his local lineman job for a dream job in a small mountain city when he was severely injured while working on a 14.4kV line. At the time of writing, you'll recall, Curt's gloves were burned onto his hands and his cell phone burned into his leg. And while I sit here at my computer typing things like, "Do this" or "Don't do that" in my columns, perhaps it's best for you to hear from Curt himself about this incident and his life afterward.

Maybe we can all learn a little something about working with lethal energy.

It happened September 13 around 2:30 p.m. The job was to string in a new three-phase 25kV (14.4kV to ground) overhead line to feed a new water plant. After 10 years in the powerline trade this job wasn't a huge or complicated job. The substituting foreman and I went up in the bucket to dead-end the wires and crimp on riser wires. While tying in a wire, I remember thinking to myself: Be careful... watch the wire you're holding.

All of a sudden I was stuck to the wire and couldn't let go. I realized I was being electrocuted. The foreman had contacted the energized 14.4kV line with his forearm. He was somehow touching my back with his other arm, so the electricity went into my back and exited through my hands.



By Dave Smith

The exit wound is always the worst. I peered down at myself for a split second and knew that something bad had happened. Conscious during the whole electrocution, I felt very helpless and scared. My hands felt like they were on fire. Words can't begin to describe the pain.

All I could think about was my wife and kids, and how I didn't want to die.

I was rushed to the hospital where they stabilized me. I remember seeing my wife, Dani (Danielle), after the incident, and we both started to cry. We were so glad I was alive. I was then flown to the burn hospital, where I stayed nearly nine weeks and underwent seven major surgeries.

While the prosthetic hand is the best piece of technology available, it can never replace the hand with which I was born.

I came close to death three times. First, the incident itself; many doctors and professionals say that my health and age saved my life. Second, I suffered a pulmonary embolism (a blood clot in my lung). And at one point I was rushed into emergency surgery because of severe bleeding after a main artery in my left arm burst.

I can't explain how glad I am that I am going to get to see my kids grow and continue through life with Dani.

On October 23, I received the worst news I could possibly hear, and was faced with a major decision. My surgeon told me that the damage in my left wrist area was more severe than originally thought. My median nerve was separated; my ulnar nerve, though intact, looked like mush. The bone was badly burnt and my tendons looked worse.

The surgeon explained I had two options. I could do nothing, in which case my left hand would have very little mobility, little to no feeling, and I would never truly be able to engage in sports again. The second option was to remove the hand and get a prosthesis.

It was the hardest decision I've ever had to make. Dani and I cried for days and weeks about it. While the prosthetic hand is the best piece of technology available, it can never replace the hand with which I was born.

I wake up every day thinking—hoping—that this has all been just a terrible dream.

The grief is evident in Curt's words, as well as those from other tragedies. Ever since Edison turned on the power, electrical workers have risked their limbs and lives for the comfort, convenience and profit of others. It's high time this changed.

Until next time, be ready, be careful and be safe. 

Note

An education fund has been established for Curt and Dani's children. Contributions can be sent to Curt, c/o Canada Training Group, 102 First Avenue, Turfedor, SK, S0M 2Y0.

Dave Smith is president of Canada training Group and has been providing consulting services to industry since 1980. At www.canada-training-group.ca you'll find stories like this one; feel free to use this information to support your own safety program.

Energy Management Solutions



Fluorescent Lampholder



Electronic Timers

Silent, Reliable



vizia+ & vizia rf+



Box Mount

Occupancy Sensors



D3200 Series



D8000



D4200 Series



a2000



Z-MAX



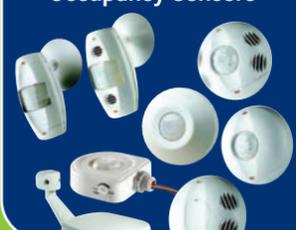
MiniZ

Ladderless Commissioning™ Daylight Harvesting System



Wall & Ceiling Mount

Occupancy Sensors



Dimmers & Fan

Controls



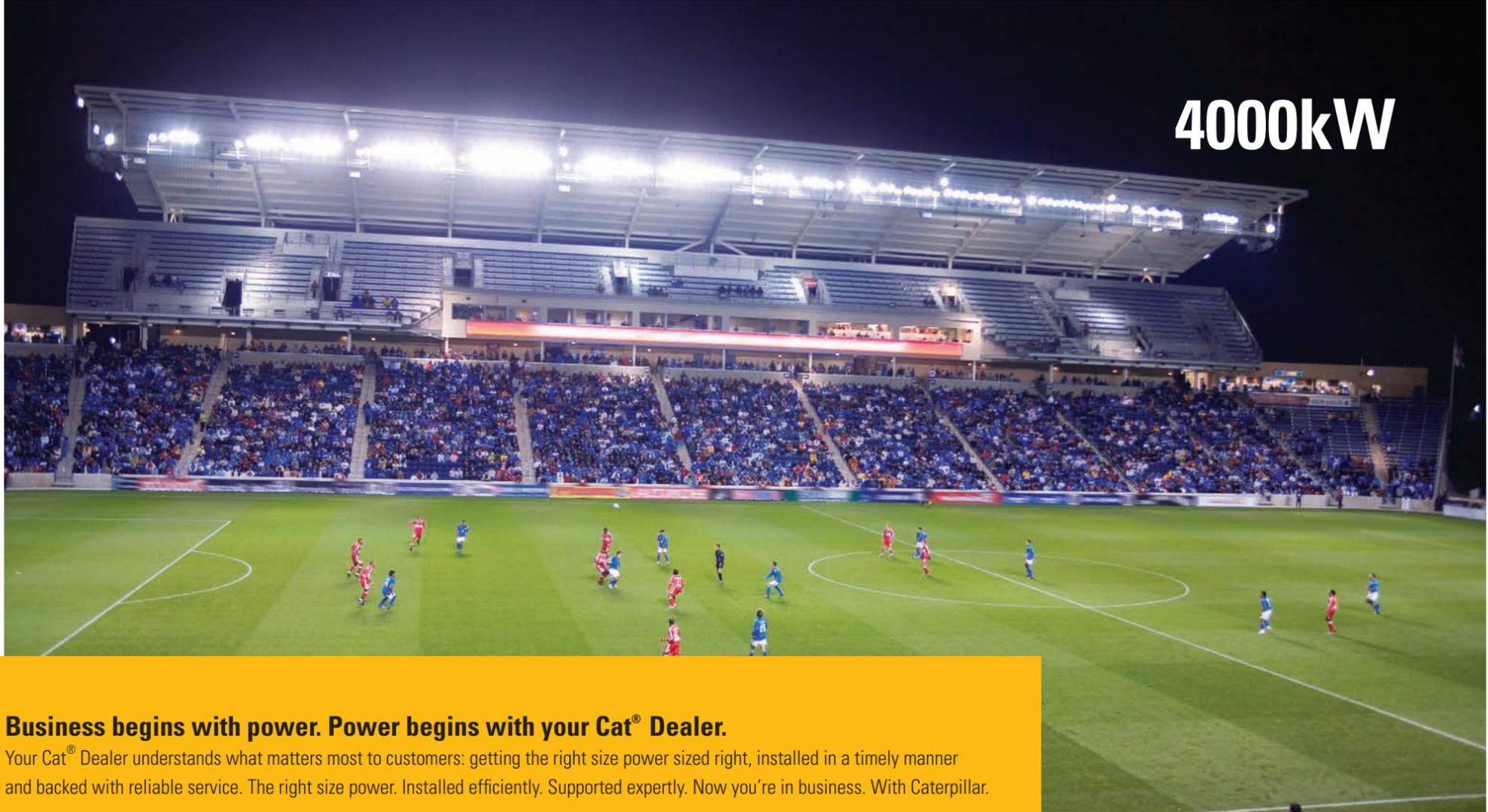
With the most comprehensive line of Energy Management Products to help you save energy, LEVITON brings it all together to assist you in building a complete Integrated Energy Management Lighting Control System.

Only LEVITON takes you from start to finish with service, technical support and design assistance.

www.leviton.com



10kW



4000kW

Business begins with power. Power begins with your Cat® Dealer.

Your Cat® Dealer understands what matters most to customers: getting the right size power sized right, installed in a timely manner and backed with reliable service. The right size power. Installed efficiently. Supported expertly. Now you're in business. With Caterpillar.

If you are interested in spec sheets and technical info, visit www.catelectricpowerinfo.com/45c.
To interact with other power generation professionals in our online community, register at www.catelectricpowerinfo.com/connect.

CATERPILLAR®
TODAY'S WORK. TOMORROW'S WORLD.™



Move over Iran, here comes a nuclear Saskatchewan

After launching a study last year, Bruce Power has concluded that nuclear power generation is feasible in Saskatchewan. A specific site for a possible nuclear power plant is now being considered, along with the launch of a comprehensive Environmental Assessment.

“Our government supports adding value to our raw uranium resources here in Saskatchewan to support the long-term prosperity of our province and our people,” said Lyle Stewart, enterprise and innovation minister.

In October, Saskatchewan established the Uranium Development Partnership (UDP) to identify, evaluate and make recommendations for the development of the province’s uranium industry. Part of UDP’s mandate is to evaluate the feasibility of nuclear power generation in the province.

“The government will use both the UDP Report and the feedback of Saskatchewan people to make decisions about next steps with regard to further development of the province’s uranium industry,” added Stewart.

Ontario says no to furthering nuclear in the province

The Ontario Government has announced it is not considering building a nuclear power generating station at Nanticoke in the Haldimand-Norfolk region. Its energy plans, says the government, call for the maintenance of the current nuclear fleet while replacing “dirty coal-fired electricity with clean, green, renewable sources such as wind, solar, water and biomass energy”.

“As we get out of using coal-fired generation for electricity, we’re looking for opportunities to replace that as much as possible with conservation and take full advantage of more renewable energy,” said George Smitherman, deputy premier and minister of energy and infrastructure. “Adding more nuclear beyond the existing supply of 50% is not in Ontario’s plans or in Ontario’s interest.”

Nuclear power currently provides over 14,000MW to the province, and has been in use since the 1960s.

Copper thefts at NB Power lead to arrests

Three arrests have been made by the RCMP after an investigation into copper theft—the result of a break-and-enter at a NB Power installation in St. Rose, N.B.

“We are very pleased that the seriousness of these crimes is being recognized and that arrests have been made,” said Duff Boyd, director of health, safety and security for NB Power. “Copper theft is extremely dangerous and compromises the safety of our employees, first responders and the public. It is our hope that arrests such as these demonstrate the implications of this criminal activity and will prevent future occurrences.”

NB Power is offering up to an extra \$5000 for tips that lead to the arrest of thieves stealing copper from its property and/or facilities.

Northwest Territories strategizing for hydro

The Northwest Territories has created a draft Hydro Strategy which aims to provide communities and resource developers with clean, reliable energy—that’s insulated from rising oil prices—for over 100 years.

“The NWT has some of the best undeveloped hydroelectric resources in Canada,” said Bob McLeod, minister of industry, tourism and investment.

The draft strategy contains 13 actions focusing on four areas: preparing for hydro development; protecting the environment; financing future hydroelectric projects; and the development of the necessary policy framework.

“The proposed Taltson River Hydro Expansion alone has the potential to save the purchase of more than 100 million litres of diesel fuel and eliminate up to 300,000 tonnes of greenhouse gas emissions annually,” said McLeod.

The territorial government plans to finalize its strategy by April.

Nova Scotia apprentices receive scholarships to complete training

Apprentices in Nova Scotia are eligible to receive financial assistance thanks to a new Department of Labour and Workforce Development scholarship program. Recently, 29 apprentices from across the province were awarded with progression and completion awards through the Apprentice Award Trust.

“These awards will help reduce some of the financial burden faced by apprentices working toward certification,” said Mark Parent, labour and workforce development minister. “We hope incentives like these encourage more apprentices to continue to increase the number of certified journeymen in Nova Scotia.”

Registered apprentices who have successfully completed requirements for the third, fourth or fifth year of training—and who pass the certification exam at the end of their program—are eligible to apply. Apprentices in a four-level program can apply for a \$350 Progression Award once they have fulfilled Level 3 requirements. Apprentices in a five-level program can apply for two separate grants of \$350 after meeting Levels 3 and 4 requirements. A completion award of \$350 is also available to apprentices who have finished training requirements and received a Certificate of Apprenticeship.

The Yukon to upgrade hydroelectric power project

The Yukon Government will lower its carbon footprint by upgrading the Mayo Dam said Premier Dennis Fentie.

“We are proposing a partnership with the federal government, First Nations and the private sector to complete Phase 2 of the Carmacks-Stewart transmission line to connect with the Mayo-Dawson transmission line,” said Fentie, adding, “We also propose a project to upgrade the Mayo Dam—a project referred to as ‘Mayo B’—which will lower our dependence on diesel fuel.”

Fentie explained this would increase The Yukon’s hydroelectric capacity by 40GWh/year. **EB**

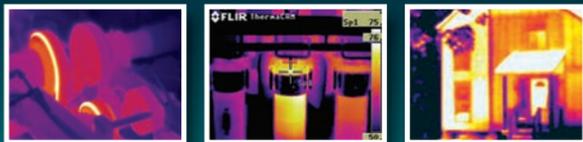
Infrared within reach!

Canada’s lowest-cost infrared camera.

i5 ADVANTAGES

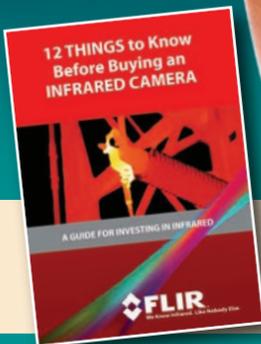
- High Sensitivity (.1 deg C) & Accuracy
- Easy to Aim - Focus Free
- Four hour battery
- Easy to Hold 340g
- 2% Accuracy
- 5000 JPEG Images

\$2,995 Canadian
5 models under \$10,000 Canadian!



1-800-613-0507 x24 or x25
or email IRCanada@flir.com for more info

www.goinfrared.com/canada/cameras/all_cameras.asp



Call or email for a **FREE** copy of "12 Things to Know Before Buying an Infrared Camera".

FREE Infrared Webinars! Visit flir.ca for the full schedule of FREE online seminars:

- 12 Things to Know Before Buying an Infrared Camera
- Thermography in Utility Applications • Fugitive Emissions & Thermal Imaging

EMT BUSHINGS

THE BEST CABLE PROTECTION

- Fast & easy press-on installation
- Holds tight as cables are pulled
- Protects cable from abrasion
- Can be substituted for costly fittings when used just for wire

for 1/2" to 4"
EMT • Rigid • PVC



Listed for
Air Handling
Spaces

Arlington 800/233-4717 • www.aifittings.com

ONE & TWO PIECE

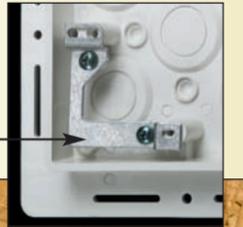
FIXTURE BOXES FOR SIDING



Arlington's boxes give you the fastest, easiest way to install light fixtures and receptacles on siding!

BOTH 808IF & 814IF OFFER:

- Ground clip for fixture installations
- UV rated plastic
- Textured, paintable finish
- Installation before or after siding's up



Patented. Other patents pending



814IF
Fixture Box

One-piece
No extra cover to lose or store
For light fixtures

Costs
20% Less
than 808IF!

808IF
Electrical Box

Two-pieces
Electrical cover and box
For light fixtures & standard receptacles

Both come with
NM Cable connector



Arlington 800/233-4717 • www.aifittings.com



© 2001 Arlington Industries, Inc. REV 0307

RECESSED POWER & LOW VOLTAGE BOX

FOR LCD AND PLASMA TVS



Patented.
Other patents pending



Arlington's recessed, 13" wide TV BOX™ and indoor IN BOX™ for new or old work, allow LCD and plasma TVs to mount flush against the wall.

Non-metallic TV BOX mounts between 16" o.c. studs for a secure horizontal or vertical installation.

In BOTH recessed boxes... Plugs stay inside the box, don't extend past the wall.

Install two duplex receptacles, or two low voltage devices in the two-gang box – or use the supplied separator to install one low voltage device and one duplex receptacle.

Textured, paintable.

NEW!



2-gang
Indoor
IN BOX™

Same great features
as the TV Box!



Option
Cover for TV Box
TVB613C

TV BOX has two additional built-in mounts for low voltage, data/media connections (speakers, satellite TV)



Arlington 800/233-4717 • www.arlnew.com

NEW SIZES MOUNTING BRACKETS

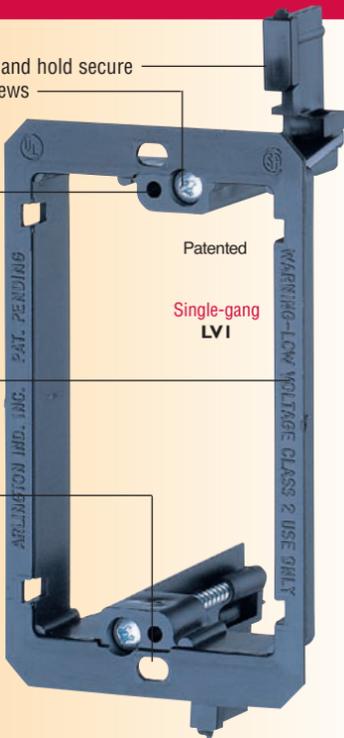
Just for CLASS 2 LOW VOLTAGE WIRING

"Wings" flip up and hold secure when Mounting Screws are tightened

Recessed Screw Hole seats wall plate flush with wall surface

Thin Front Lip seats better on drywall

Oval Hole allows for final shifting & straightening of device



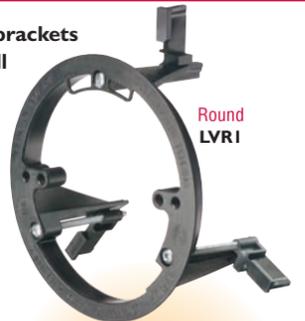
Patented
Single-gang
LVI

Use Arlington's non-metallic mounting brackets to install class 2 wiring – and to seat wall plates flush with the mounting surface.

In addition to our single gang LVI – We now have two, three and four-gang styles and the Round LVR1!

For existing construction, our low-voltage mounting brackets...

- Adjust to fit 1/4" to 1" thick drywall, wallboard or paneling
- Install faster, and cost less than metal



Round
LVR1

Try LVR1 for low voltage smoke detector installations

NEW SIZES



4-gang
LV4



3-gang
LV3



2-gang
LV2



Arlington 800/233-4717 • www.arlnew.com Patented. Other patents pending

HALF POWER. HALF LOW VOLTAGE.



IN ONE EASY TO INSTALL RECESSED ELECTRICAL BOX.



Arlington's recessed two-gang TV BOX™ for old work allows you to mount LCD and plasma TVs, and other system components flush against the wall.

This two-gang box is a combo box with half 110V for power and half low voltage for Class 2 wiring of satellite or cable TV, speakers, surround-sound, etc.

Mounting "wings" tighten against the wall board to hold the box firmly in place. There's no wobble. Plugs stay inside – don't protrude past the wall!

Secure installation. Good looks. A great finish.

Fast, easy installation of power & low voltage devices! Mounting "wings" hold box firmly in place.



Patent pending



Arlington 800/233-4717 • www.arlnew.com



Getting shoppers, and turning them into buyers

What's the difference between marketing and sales? Basically, marketing involves all the activities you do to get your phone ringing, whereas sales involves everything you do to actually land the job.

If you're getting a lot of phone calls, then your marketing process is sound. But if you're only converting a fraction of those calls into sales, your sales process is weak. (Also, when you analyze your sales process, you should find that your conversion rate on referrals is higher than from cold contacts.)

So now that times are tough, you need to use focused techniques to get sales at fair margins. I say "fair margins" because anyone can land a job on which they're going to lose money. You want sales that will generate good profit.

Referrals

Referrals are a great source of new business, but what are you doing to get yourself referred? Are you sending out letters or phoning existing customers? Are you offering them rewards for sending business your way?

This is probably the cheapest way of generating new business, and your conversion rate should be very high. Also, when you reward clients who refer you, it means you reward them only after *you've landed the new business*. This is much more productive than simply advertising in the newspaper.

ACTION: Develop a referral strategy.

Upsell existing customers

What other services could you sell to your existing customers? Identify their needs and come up with a strategy for telling them about your other services (and you can tell them about your referral program at the same time).

ACTION: Develop a full list of your services and make sure your customers are aware of them. Educate your team on promoting them.

Good times, bad times, there will always be advertising. In good times, people want to advertise; in bad times they have to.

— Bruce Barton

Advertising

Make sure your advertising focuses on what your customers need. Say I'm a potential customer: what challenges do I face if experience a power problem or outage? Your advertising should focus on my challenges and offer solutions that minimize or negate the situation.

Don't use your business name as the headline for the advertisement. Instead, use a statement that encourages prospects to read the rest of the ad. Common headline formats include:

- A question: "When it comes to managing electricity costs, is your company a well-oiled machine?" or "Are you looking to hire?"
- An invitation: "Play two poker hands... on us!"
- A command: "Don't miss the new LHTQ!"
- A news flash: "New best-in-class thermal imagers"
- A single word: "Futureproof"
- A statement: "The thinking man's industrial multimeter" (These examples were taken from ads appearing in the pages of *Electrical Business*.) The purpose of the headline is to

attract the target audience's attention, and you only have between one and seven seconds in which to do it before they pass you by.

You always need a call to action. When there's a special offer, include the deadline.

You also want to track where enquiries come from. Make it a point to ask people how they heard of you. You'll discover which of your marketing techniques are working (and which ones are not), and this knowledge will help you decide where to invest future marketing and sales budgets.

ACTION: Develop a good advertisement focusing on the customers' needs. Come up with a good headline and a call to action. Monitor your results.

Turn shoppers into buyers

You have to help your prospect to buy. First off, though, establish on a scale of 1 to 10 how important your service is to the prospect. If 10 is very important, and the prospect is sitting at around a 5 or a 6, then chances are good this is not a serious prospect. Establish this early on so that you don't waste your time. (When it comes to sales, Yes and No answers are the best. It's the "maybe" answers that drive you crazy.)

And while every prospect is unique in its own right, you are still more likely to win the business by being, not aggressive, but assertive. Ask for the business. When they waffle, find out why they are reluctant to buy.

A technique I often use with prospects is to explain they have four choices:

1. They can do nothing. (This means they will get nothing done. If that's what they want, then leave them be.)
2. They can do it themselves. (This could mean that they're not remotely interested in hiring anyone: they just want to pick your brain for free advice and ideas. If they are the DIY types, warn them of the dangers involved when they don't hire a professional. When they insist on going down that road, stop giving them ideas and move on.)
3. They can hire you to do the job.
4. They can hire someone else to do the job.

Once you get your prospect to choices #3 and #4, you know you have a serious prospect. To get them to choice #3—the conclusion you want—you must have a script. Ask them why they would consider hiring another electrical contractor, and make sure you get an honest answer.

If they have not said, "We think we'll get a better price elsewhere," yet they won't commit to you, then raise the issue of price. Your script should include statements like: "We won't be the cheapest, but we provide good value", or "We do the work on time, on budget, to your standards because we expect to get referrals from you afterward", or "Here are reference letters from customers who were delighted with our services".

ACTION: Develop a script to convert choice #4 to choice #3.

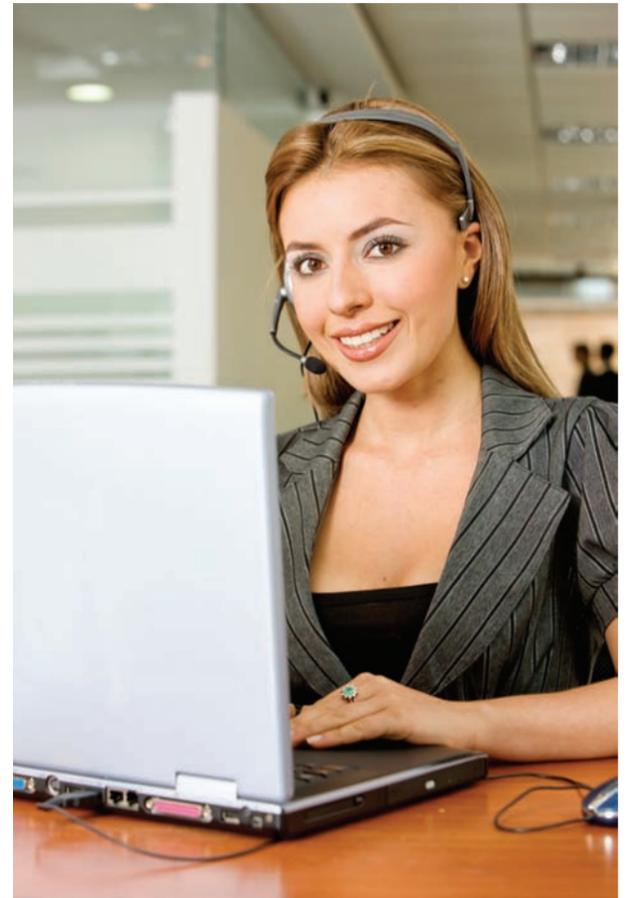
Develop a relationship

Remember, you're not closing a sale, but developing a relationship. That's how I work with my clients: I'm not looking for a "one-night stand". Make sure this position is clearly communicated to prospects.

Offer guarantees

Don't guarantee the product: everyone does this and it should be a given. Instead, guarantee the process. In fact, ask your current clients this question: "If you had a magic wand, what one thing would you change about the way I do business with you?"

The answers they provide may give you some ideas for guarantees you can offer, such as:



- "We will return your call within an hour."
- "We will provide a firm price before we start any work."
- "We will be at your home/business within an hour of the scheduled time, or we'll give you a \$25 discount."
- "When we cannot be at your home/business within an hour of the scheduled time, we will phone you two hours in advance to reschedule."
- "We will clean up after ourselves at the end of each day."
- "We will phone you after the job is complete to ensure you are 100% satisfied."

Of course, before offering any guarantee, you have to be sure you can meet it. Discuss this with your people. For example, a supplier in Ontario has implemented eight specific guarantees; among them:

- 98% order fill rate each month, or we'll give you a 1% credit on that month's purchases.
- Phone-in orders will be ready for pick up within an hour, or we'll credit \$25 to your account.
- 100% fill rate and accuracy on quoted fixture jobs, or we'll credit \$300 to your account per job.

Isn't this the type of supplier you'd like to deal with? There is great accountability and measurability.

Find out what frustrates your customers and provide guarantees to eliminate those frustrations. Focus and consistency will help you make money and survive the tough times ahead. 

ACTION: Develop a guarantee that eliminates the frustrations a client might experience when dealing with you.

Ron Coleman is a member of the Institute of Certified Management Consultants of British Columbia. A noted speaker, he has completed many interfirm financial comparisons of groups of construction companies in Canada and the United States. Ron's numerous published education programs include a 36-hour business management course specifically designed for ECABC. He is also author of the book, "Your Million Dollar System: How to Increase the Value of Your Construction Business by One Million Dollars in Three Years". Visit www.ronaldcoleman.ca.



In this installment, we're focusing on products/attachments you use to cut, bore, drill, bend, twist and turn.

Our vehicles and tools are inextricably linked: where would we be without one or the other? This is why we decided to launch a new department this year that combines the attributes of both Tools for the Trade and Trucks for the Trade into one: hence, Vehicles and Accessories. In this section you'll always something new and productive we feel you should have in your vehicle—if not a new vehicle altogether.



● **OEL** has produced a double-insulated safety tool series that handles both metric and standard applications. The combination tool wall drive profile was designed to provide a greater area of force application than conventional tools. In distributing the torque load to the fastener through the flats, the tool not only achieves a greater force but lowers the possibility of distortion to the nut or bolt head. The sockets are capable of exceeding the tightening torques specified in the DIN standard by 70% to 100%, depending on the socket size. Each insulated tool has a lifetime replacement warranty. Each insulated hand tool OEL manufactures is rated for exposure up to 1000vac and dielectrically tested at 10,000vac, meeting or exceeding ASTM F1505-01 and IEC 900 standards. The insulating material used is impact-resistant and flame-retardant. Plus, because two colours are used, tool inspection is simplified: when the yellow underlayer is showing, the tool may no longer be insulated properly.

● **Milwaukee** says its new Ice Hardened Sawzall blades offer up to 50% longer life than the competition. The blades undergo a proprietary cryogenic hardening process that improves upon traditional heat treat processes, says the company. Unlike surface coatings that wear away, cryogenics harden to the core by minimizing soft metal and creating more hard metal throughout. They also feature Matrix II bi-metal construction for durability, and a precision-ground tooth geometry for faster cutting. A positive rake angle cuts more aggressively while deeper gullets quickly remove chips. A radiused back face reduces stress on the teeth, ensuring the blades delivers optimum life and speed. 13 different Ice Hardened Sawzall blades are available, in a variety of lengths and tooth configurations, as well as in both standard and The Torch demolition configurations. All blades are available in both five and 50 packs, and there's also a 14-piece Ice Hardened kit.



● **Ideal** launched Bul-z-Eye self-feeding wood boring bits to its line of cutting tools accessories. The company says these bits are "the ultimate solution" for contractors seeking to bore holes in wood for running pipe, tubing and conduit. Aggressive twin-edges easily power through treated or wet wood, without binding or jamming. The twin edges' precision-ground teeth provide up to a 50% wider cutting surface, resulting in improved cutting speeds, better balance and cleaner, more accurate holes when compared to bits from competitive brands, says Ideal. Wobbling is eliminated by the Bul-z-Eye's precision-machined shaft that achieves perfect bit concentricity and by its burr-free lead screw that feeds the bit through wood at a consistent rate. The bit is fully hardened throughout and a black oxide coating prevents corrosion. In addition, lead screws are replaceable using a hex wrench, extending the drilling life of the bit, and a range of bit diameters are available.



● **Greenlee** launched an entire family of new bender heads, handles and head/handle combinations within its Site-Rite hand benders line. These benders offer both aluminum and iron head castings to meet your preference for feel, weight and work on EMT, IMC or rigid conduit. The company's benders come with the patented Site-Rite sighting system, which promises accurate head-down bends and features cast-in markings for head-up bending—as well as for producing stub-ups, offsets, saddle bends and back-to-back bends. The power pedal feature (with a larger foot area on the head) is available on both the aluminum and iron 1 1/4-in. bender heads for greater control, stability and leverage. The aluminum and iron 1/2-in., 3/4-in. and 1-in. bender heads all have enlarged foot pedals and increased toe room. All bender handles are a consistent diameter, offering a bigger grip area. All Site-Rite hand benders come with a lifetime limited warranty.

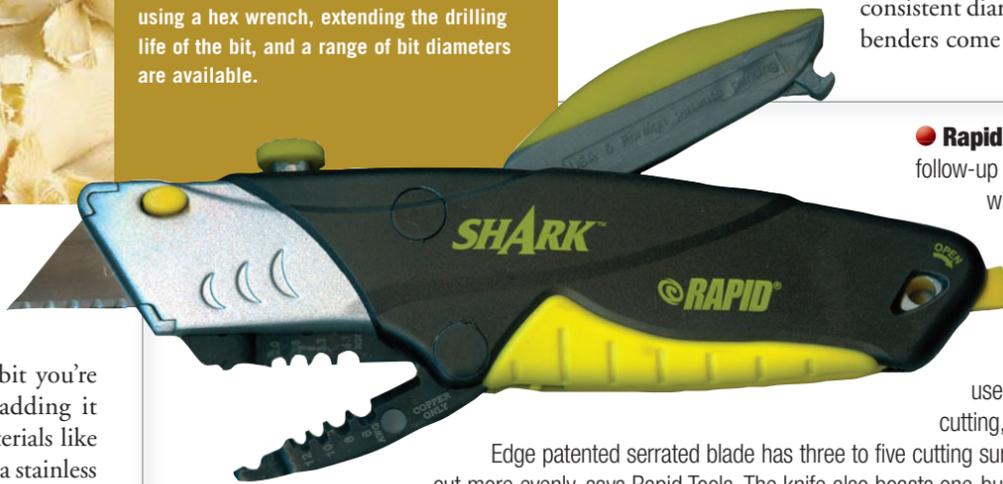


● **Irwin's Unibit** step drill bit is constructed of M35-grade cobalt high-speed steel, which allows it to last up to six times longer than the bit you're currently using, says the company, adding it allows you to drill through tough materials like cast iron, and carbon, alloyed and 16-ga stainless steels. The Unibit replaces an entire twist drill set with just one bit, as it allows you to drill up to 13 different hole sizes without ever changing chucks. Every Unibit step drill is engineered with a single, radial concave flute to provide control while drilling true, round holes. Laser-marked sizes, three-flatted shanks, minimal vibration and patented Speedpoint tips are features built into all Unibit step drills.



● **Rapid Tools** has unveiled the Big Bite Rapid Shark as a follow-up to its original Rapid Shark. This tool is intended for wires (6-12 AWG). "It's got the same precision bite," says the Burlington, Ont.-based company, "just a bigger appetite." The knife and wire stripper are combined in a rugged, ergonomic case about the size of a standard knife. The pliers-like grip for the stripper lock securely into the body when not in use. It's spring-loaded for easy opening and comfortable cutting, with five precision-ground stripping holes. The Rapid

Edge patented serrated blade has three to five cutting surfaces that reduce friction, stay sharp longer and cut more evenly, says Rapid Tools. The knife also boasts one-button blade changes, and a four-blade storage compartment. In Canada, the Shark is available exclusively from Home Hardware under the Benchmark brand.



● **Ridgid's RC-2375** ratcheting plastic pipe and tubing cutter is suitable for materials up to 2 3/8-in. o.d. The durable aluminum construction and ergonomic handles provide a comfortable grip for precise and easy cuts of plastic pipe and tubing, says Ridgid, such as PVC and CPVC, PEX, polyethylene, polybutylene and rubber hose. The blade design, combined with a ratcheting mechanism, reduce the amount of force needed to cut through these materials. Featuring X-CEL quick-change technology, the blade can be changed in seconds without any tools, and lasts up to 2000 cuts. The quick-change pin has no clips or screws that might be lost during a blade change. The lightweight RC-2375 fits in your pocket and is operated with one hand, making it easier to hold the material being cut. An easy-turn thumb latch holds the cutter closed and protects the blade when not in use. For convenience, ergonomic grips built into the bottom handle are spaced at 1/2-in. increments to provide a quick measuring scale. **EB**



GE debuts incandescent-shaped Energy Smart CFL bulb

Miniaturized electronics developed by GE engineers and scientists have led to the



creation of a new covered GE Energy Smart CFL bulb featuring the GE Spiral CFL within. The electronics fit in the neck of the bulb; the result is a profile that's virtually identical to a standard incandescent. The company expects this 8000-hr, 15W CFL to appeal to consumers desiring the energy savings and performance of a Spiral CFL with the aesthetics and fit a traditional bulb. GE plans on broad distribution for the new bulb around Earth Day (April 22). Afterward, the company expects to introduce 9W and 20W versions.

GE CONSUMER & INDUSTRIAL
www.ge.com

Highlites HL4X emergency lighting units



Highlites' HL4X Series of hazardous-location 6V and 12V emergency lighting units is designed for use in NEMA 3, 4X and 12 application areas where oil, water and dust resistance is required. The units boast rugged fiberglass enclosures and gasketed sealed construction, and are available in a range of wattages. They have built-in viewing windows on the front cover for monitoring both the AC indicator light and optional metering devices. The series also features adjustable thermoplastic dual lighting heads with locking swivel assemblies. The units offer a choice of lead calcium or nickel cadmium batteries, with 90 minutes of emergency illumination and automatic brownout protection.

HIGHLITES
www.highliteslighting.com

Tyco extends Micro Mate-n-Lok connectors

Tyco extended its line of Micro Mate-n-Lok soft-shell connectors with a low-profile version. A vertical height of less than 4.7



mm—about 45% lower than existing members of the family—makes these connectors suited to space-constrained LED lighting applications in the appliance, industrial machinery and security system industries. Available in two, three and four positions on a 3-mm centre line, the connectors include right-angle, surface-mount headers. The line uses standard Micro Mate-n-Lok contacts with 24-20 AWG and 30-26 AWG wire ranges. The connectors feature positive latching to prevent unmating, and 94V-0-rated nylon housing. Contacts are phosphor bronze with a choice of tin or gold plating. The connectors are rated up to 5A and 250V.

TYCO ELECTRONICS
www.tycoelectronics.com

Wago 873 Lumi-Nuts three-pole model disconnect



Wago has added a three-pole model to its 873 Series Lumi-Nuts luminaire disconnect line. Suitable for applications ranging from retrofits to elevators, the 903 is a safe electrical disconnect for high-feature linear fluorescent fixtures using a dimming circuit or DALI protocol. Power input/line side accommodates AWG 18-12 solid and AWG 16-12 stranded conductors; ballast/load side accepts industry standard AWG 18 solid conductors. The unit offers a touch-proof design—whether mated or unmated—that minimizes the need to disconnect power for service. An integrated locking latch prevents unintentional separation of the mating halves. The connectors are keyed for mis-mating protection and colour-coded for simplified wiring. Mating halves carry on-unit markings to further reduce wiring errors. Lumi-Nuts terminations are vibration- and temperature-cycling resistant.

WAGO
www.wago.us

Ideal three-wire PowerPlug luminaire disconnect



Ideal expanded its PowerPlug luminaire disconnect line with a three-wire model (3A/120V) for switching and dimming. Installed without tools, this push-in device allows you to safely disconnect hot and neutral ballast wiring prior to fixture servicing, preventing potential contact with live voltage. To re-power the fixture, you simply snap the two halves of the disconnect back together. Made to fit through a 1/2-in. knockout, the three-wire disconnect can be used for both retrofitting installed fixtures or for OEMs seeking to design code compliance into their lighting fixtures.

IDEAL INDUSTRIES
www.idealindustries.com

Bodine B4CF3 emergency ballast



Bodine's new B4CF3 Cold-Pak extended-temperature fluorescent emergency ballast is designed for tough environmental conditions. Measuring just 6 x 5.5 x 1.62 in. enables it to fit into tight fixtures.

Operating in temperatures ranging from -4°F to +131°F, the unit is suitable for damp locations as well as sealed and gasketed fixtures. The ballast powers one 13-42W twin, quad or triple twin-tube, 22-40WT5 circline or 18-39W long compact for a minimum of 90 minutes in emergency mode, and provides up to 1250 lumens initial light output.

BODINE
www.bodine.com

Chloride Fusion III solid-state lighting



Fusion III is another addition to Chloride's solid-state lighting family. Housed in die-cast aluminum with a polycarbonate lens, the unit offers a high-output, long-lasting, energy-efficient white LED with a custom reflector. A 120/277 dual-voltage input with surge protection and Intelli-Charge for self-diagnostics allows Fusion III to serve as an emergency lighting unit with a reliable charging system. A sealed nickel-metal-hydride battery allows for 90 minutes of emergency power.

CHLORIDE
www.chloridesys.com

Leviton PowerSwitch DS30AX safety disconnect switch



Leviton expanded its line of PowerSwitch watertight safety disconnect switches with the DS30AX—a compact (4.5 x 5.28 in.) 30A, 600vac non-fused switch. Constructed of impact-resistant, non-conductive thermoplastic, the unit is designed for harsh environments and motor disconnect applications. Features include a watertight hub, four mounting feet, seven conduit entry points, integral ground plate and factory-installed auxiliary contact. The enclosure has a front-operated handle and a bottom-hinged cover for use in tight spaces. Its 'pistol grip' handle with integrated lockout provides quick visual confirmation of the switch's power status. The cover has a bottom hinge mechanism that pivots 180° for enhanced safety and easier access during installation and maintenance.

LEVITON
www.leviton.com

Nordic PSP-151530-MG-L Series plastic secondary pedestal



Nordic Fiberglass introduced the PSP-151530-MG-L Series plastic secondary pedestal to attach secondary connectors. The installed plastic bracket accommodates up to three, 6-port 350MCM or 600MCM lay-in or set-screw connectors. Each connector is covered by a clear plastic cover with a plastic tie for added safety. The pedestal can be buried 12-in. deep for underground electrical distribution. The lid can be used as a chair while training secondary cables into the connectors. The pedestal measures 15 x 15 x 30 in. and weighs 31 lb.

NORDIC FIBERGLASS
www.nordicfiberglass.com

AEMC Simple Logger II L101



With a choice of data storage modes and rates, AEMC's Simple Logger II Model L101 current data logger offers an internal memory that stores about 240,000 measurements. Extended Recording Mode (XRM) and delayed start time are two application-friendly features in this logger. The unit records True RMS alternating current at user-selectable rates, from eight every second to one every day. Currents can be measured and recorded with 0.1A resolution. Battery-operated and compact, the logger facilitates installation in tight locations without the need for external power. Instrument configuration, data storage and report generation from pre-defined templates or operator custom-designed templates are standard.

TECHNICAL
www.technical-sys.com

Bussmann Low-Peak current-limiting fuses

Cooper Bussmann created the Low-Peak family of current-limiting fuses for use in main, feeder and branch circuits (up to 600V), or for supplemental protection in equipment, panels or assemblies. Unlike circuit breakers, says the company, these fuses afford overcurrent protection while requiring less maintenance and calibration (thereby reducing downtime). Current-limiting fuses minimize incident energy to reduce arc flash hazards and fault currents. Selective coordination is simplified with a 2:1 amp ratio between upstream and downstream fuses. Low-Peak fuses reduce inventory by up to 33%, says Cooper, and they're available classes L, J, CC and RK1.

COOPER BUSSMANN
www.cooperbussmann.com



Are you prepared for Z462-08, Canada's First Workplace Electrical Safety Standard?

From



arc Flash Labels

to



462 Workplace Electrical Safety Posters...

Contact Brady for your Workplace Electrical Safety Needs!



Call 1-800-263-6179 to reserve your copy of our Workplace Electrical Safety Brochure available early 2009.



AEB019

Extech InfraCam SD camera



Extech's compact InfraCam SD thermal imaging IR (infrared) camera weighs in at just 19 oz (including battery), and enables you to proactively monitor the condition (any hot spots) of electrical systems. Its thermal sensitivity is better than 0.18°F to help pinpoint problems fast. The 3.5-in. colour LCD screen offers sharp resolution, while the standard 128MB SD card stores up to

1000 radiometric JPEGs. All 14,400 thermal pixels of each image can be analyzed using the included QuickReport PC software. The unit's spectral range is 7.5-13µm and the field of view is 25° x 25° at a minimum focus distance of 0.3 metres. With an 100-240vac adaptor/charger, the rechargeable Li-ion battery provides up to seven hours of continuous operation on a single charge.

EXTECH INSTRUMENTS
www.extech.com

Fluke Ti25 and Ti10 thermal imagers

New thermal imagers from Fluke are engineered for durability, and can withstand water and dust. They integrate infrared and visual (visible light) images for ease of identifying and analyzing problems. Each imager also includes Fluke SmartView software for viewing, annotating, editing and analyzing images. The Ti25 and Ti10 models are used for day-to-day troubleshooting and maintenance of electrical installations, electro-mechanical equipment and HVAC/R installations. The three-button menu is designed for intuitive operation/navigation and on-screen emissivity correction with the push of a thumb. The Ti25 is also able to record and save voice comments with every image taken.



FLUKE ELECTRONICS CANADA
www.flukecanada.ca

Hendrix HPI-55-5 tie top pin insulators



Hendrix Wire & Cable offers a new lightweight (just over 1 lb) high-density polyethylene tie top pin insulator, the HPI-55-5. The product's durable construction is vandal-proof and resistant to cracks, chips and breakage, says the

company. Designed in two models, both are suited for bare wire and covered conductors. The HPI-55-5 offers long leakage distance and higher impulse strength than porcelain conductors, Hendrix says. Additionally, every insulator is made to withstand ultraviolet rays and, due to the proprietary high-density polyethylene material, offer enhanced track resistance.

HENDRIX WIRE & CABLE
www.hendrix-wc.com

Amprobe ACD-14 Plus 600A clamp-on multimeter

The ACD-14 Plus is a new 600A clamp-on multimeter from Amprobe. Its dual-display allows you to simultaneously read amperage and voltage. The thin jaws, meantime, permit easier access into tight measurement areas while accommodating conductors up to 28 mm. The meter measures AC to 600A, AC and DC voltage to 600, capacitance to 3000 µF, resistance to 40MΩ, temperature (with Type-K thermocouple probe) and micro amps (for testing flame sensors). It features a continuity buzzer, auto Power Off, Low Battery indication, test leads, bead-type thermocouple probe with banana plug, and rubber over-moulded carrying case.

AMPROBE TEST TOOLS
www.amprobe.com



Chloride Oneac PCm medical-grade power conditioner

To help combat power fluctuations and electrical transients that can damage critical electronic-based medical systems, Chloride offers its Oneac PCm medical-grade power conditioner. This equipment can minimize power contaminants by using a full-time, online isolating transformer. Unlike surge suppression devices, this technology converts a noisy safety ground to a noise-free signal ground, and provides a separately derived power source that limits earth leakage current to less than 100µA. Available in models ranging from 120va to 3000va, the PCm Series comes with hospital-grade plugs and receptacles.

CHLORIDE NORTH AMERICA
www.chloridepower.com/usa

Ideal 61-521 phase and motor rotation meter

Ideal Industries' 61-521 phase and motor rotation meter is a versatile tool for those involved in installing/repairing industrial motors, says the company. Designed for use on equipment up to 600V, the device provides three troubleshooting functions in a single unit: identifies three-phase sequence; indicates motor rotation; and checks for open phases. The colour-coded wired leads feature large alligator clips for ease of use. Bright red and green LEDs show rotation of de-energized motors. Three four-foot leads and a rugged carrying case are also included.

IDEAL INDUSTRIES
www.idealindustries.com

Next Generation Power UCI 2-5.5 generator

Next Generation Power launched its 5.5kW diesel generator, the UCI 2-5.5, to provide



backup power for outages and onsite construction equipment. A heavy-duty, water-cooled, two-cylinder Kubota diesel engine employs a three-vortex combustion system to deliver high power output with cleaner-burning exhaust. Running at 2800 rpm, this 240-lb generator minimizes noise, vibration and wear for a lengthy service life, says the company. The unit features resilient isolation mounts, one-sided service and an easy-drain oil change system. With a compact design (23 x 20 x 21 in.), the generator also comes with a remote start panel, hour meter, harness and oil pressure and water temperature shut down.

NEXT GENERATION POWER
www.nextgenerationpower.com



REGISTER NOW FOR NETCOMM PRAIRIES 2009!



CLB Media, one of Canada's leading business-to-business publishers and event producers, is pleased to present the NETcomm Prairies 2009 Conference in Saskatoon, Saskatchewan.

NETcomm combines a trade show-like forum with a series of educational seminars and technical workshops related to the design, installation and maintenance of communications infrastructure and related components.

If you are involved in purchasing, designing, installing, integrating or maintaining communications infrastructure, then you don't want to miss **NETcomm Prairies 2009.**

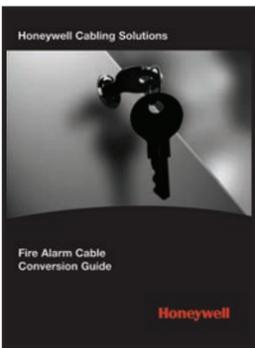
It's a great opportunity to meet with valued suppliers, see what's new in the market, gain valuable information and network with industry peers.

APRIL 21-22, 2009
AT THE HISTORIC DOWNTOWN
DELTA BEESBOROUGH, SASKATOON, SASK.

FOR MORE INFORMATION and to register for NETcomm Prairies 2009, please visit www.netcommshow.ca



Early Bird Registration Ends March 16 2009!



Honeywell Fire Alarm Cable Conversion Guide

Honeywell's 38-page Fire Alarm Cable Conversion Guide details cables from Honeywell companies (Firelite, Silent Knight, Gamewell and Notifier, in addition to its namesake brand) to help contractors retrofitting fire alarm systems. The guide focuses on specification needs met by the various cables, ranging from gauge sizes, shielding configurations and jacketing materials.

For a free copy of the Fire Alarm Cable Conversion Guide, visit www.honeywellcable.com.

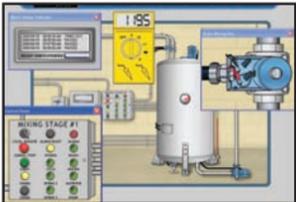
New software capabilities for Fluke 287 and 289



Fluke is offering new, free 'firmware' for its 287 and 289 True-RMS logging multimeters that you can download and install yourself. Among the new features of the software upgrade is Zoom on Trend, which lets you view and analyze TrendCapture data and see detail at X5 magnification. There's also an improved Trend View graph plot; its algorithm plots the minimum, maximum and sample point for each sample interval and event record.

To learn more, and to download the free firmware, visit www.flukecanada.ca. Once there, click Support at the top, followed by Software Downloads, then scroll down to DMM Upgrades. (You may have to order a free Fluke USB-IR serial cable.)

Simutech FPS 3000 industrial control system troubleshooting simulator



Simutech's FPS 3000 troubleshooting simulator is designed to help develop advanced troubleshooting techniques on a complex industrial control system. The software uses a realistic simulation of a typical fluid processing system found in many industries, and teaches a systematic approach for troubleshooting and repairing both electrical and mechanical faults safely and efficiently. It's designed for use in various environments, including formal training programs, classrooms or labs, small businesses or shops, and individual learning.

To learn more, visit www.troubleshootingskills.com. Also, be sure to check out the digital version of this edition, which contains a review of the FPS 3000 by Electrical Business.

Arcad Arc Flash Analytic software

Arcad's Arc Flash Analytic software (v3.0) was developed based on NFPA 70E and IEEE 1584, and is used for: calculating arc incident energy; flash protection boundary; determining limited, restricted and prohibited shock approach boundaries; and risk category. The software applies to systems with voltages in the range of 208V to 46kV; bolted fault currents in the range of 700A to 106kA; and switchgears, MCCs, panels, cables and arc in open air. It provides fuse and low-voltage circuit breaker equations, and more.

For more information, visit www.arcadvisor.com.

Kichler publishes ceiling fan catalogue

Kichler Lighting's expanded decorative ceiling fan collection is covered in a new 92-page, full-line catalogue that includes more than 20 new designs and features fans for every room of the home. Many of the fans are designed to match existing Kichler families. Among the features of the new fan lines (though not all are found in all fans) are CoolTouch remote control, reversible finish blades, optional light kits, up/down lighting and more.

Find Kichler products online at www.kichler.com.

IES launches online career centre

The Illuminating Engineering Society of North America (IES) has launched the IES Career Center—an online resource designed to help job seekers and employers in the lighting industry find one another. For seekers, the centre offers free resume posting, automatic e-mail notification, confidential application process and Saved Jobs capability. For employers, the centre offers a simple posting process, automatic e-mail notifications, report statistics, targeted audience and, says IES, competitive rates.

To get started, either as employer or seeker, visit careercenter.ies.org.

Watt Stopper/Legrand "Quick Guide to Reducing Lighting Energy Use at Home"



Watt Stopper/Legrand's compact application guide, "Quick Guide to Reducing Lighting Energy Use at Home", depicts the energy-saving benefits of residential lighting controls. The product and application information is presented in simple terms and illustrated with photographs and diagrams. It can help you sell home owners on the possible savings to them when they replace standard wall switches with automatic controls, such as vacancy and occupancy sensors.

The guide is available by contacting Watt Stopper/Legrand, or simply download the PDF version at www.wattstopper.com.

Arrow Hart brand healthcare solutions tools



Cooper Wiring Devices introduced healthcare solution-based selling and informational tools through its Arrow Hart brand. The cornerstone of the new program is an expanded website that provides product information as well as downloadable photos and literature. In addition, a 32-page Healthcare Solutions buyers' guide focuses on specific challenges and solutions, such as nurses' stations, pediatric care, and hallways and corridors.

You can find out more by visiting www.cooperwiringdevices.com (click Healthcare Solutions at the right).

Fibox ARCA enclosure brochure



Available in both print and online, Fibox's new ARCA enclosure brochure highlights 10 JIC standard, RoHS-compliant, corrosion-resistant enclosures. Ranging in size from 6 x 6 x 4 in. to 18 x 16 x 10 in., the enclosures protect electrical and electronic equipment in industrial applications. For each of the enclosures, the brochure provides part numbers for opaque and transparent screw covers, hinged screw covers, and hinged covers with latches. It also includes interior sizes, exterior overall dimensions, panel sizes, and mounting locations. You'll also find technical specs, such as IP rating (ingress protection), and UL and NEMA ratings.

To receive the four-page Fibox ARCA enclosure brochure, visit www.fiboxusa.com and click Literature.

EDSA Paladin BlackBoard power infrastructure simulation



Much like a flight simulator for flying, EDSA says its Paladin BlackBoard power systems simulator lets you simulate and test real-time power configurations, maintenance, repair and other procedures before attempting them on live systems. It also serves as a training tool; using how-to methods coupled with trainee trial-and-error, workers learn precisely what problems—and solutions—are likely to emerge. Users can figure out what changes can help extract more system capacity, and prioritize the power requirements of mission-critical processes.

Visit EDSA Micro Corp. at www.edsa.com for more information.

Singletouch Mobile solution for electrical contractors



Singletouch—the developer of a data-capture platform for electrical contractors in industrial construction—released its Singletouch Mobile solution, which is the deployment of its software platform on rugged hand-held devices, enabling instant relay of field data back to the office to expedite payroll, accounting and project reporting. Mobile is an extension of the company's Office and Jobsite. The software tools are integrated, sharing data and allowing only the authorized transaction maker to input and access only the data relevant to that task. Singletouch sells the software platform and hardware device as a complete solution.

Visit www.singletouch.com.



From Victoria to St. John's, we're celebrating – because all Open Shop associations have united to form Merit Canada. The name's a little different. We've got a new look. But beneath that, the foundation is the same. As one national organization, we're recognizing what every province has done for the open shop sector in Canada – and how we can now do it even better, together. As a company of Merit Canada, you'll be stronger. More supported. Your benefits will work harder and your programs more efficiently. As one, Merit Canada can make open shop construction better for you and your workers than ever before.



1-877-416-3748 MERITCANADA.CA

Electrical Design/Simulation Software Etc.

The Constructor- Ladder Logic Design & Simulation
 Res Wire Pro - for Professional Residential Wiring.
 Bentley promise - Electrical Control System Design.
 Dolphin Volts - Automate the electrical design process.

Tutorial Software- ControLogix Trainer, PLC Trainer
 HMI-covers RSView 32 works, MC Motor Control
 Trainer, TSTroubleshooting Trainer,
 VFD Variable Frequency Drives.

Waltech Associates

Tel: 905-466-7417 Fax: 905-315-8492
 e-mail: info@waltechassociates.com
 www.waltechassociates.com

GE Consumer & Industrial
 Electrical Distribution

Spectra™ Series Busway

Heavy-Duty Power in a Light Package

- For applications requiring up to 5,000 amps of capacity with short-circuit protection
- Lightweight – at least 50% lighter than comparable wire and conduit
- Lighter than competitive busway
- Compact – easy to install in tight spaces
- Flexible – expand, remove and relocate runs with minimal effort
- Can lower total installed cost by up to 75%

For complete details, call 1-877-259-0941, ext. 2912 or e-mail us at marketingcdn@ge.com. www.gelighting.com



SHARP
 solar electricity

- * Solar Off Grid And Grid Tie Specialists
- * Remote Power & Backup Systems
- * Qualified Installers Wanted



VICTORIA • VANCOUVER • BARRIE



Contact Us For A Free Catalogue
 1.866.437.5529
 sales@heshomeenergy.com

www.heshomeenergy.com

GE Consumer & Industrial
 Electrical Distribution

Entellisys™ Low-Voltage Switchgear

Advanced Protection and Control

- Advanced zone-based protection gets around need for cascaded time delays
- Bus differential protection detects faults below gear's full current rating
- Zone interlocking can interlock an instantaneous trip with a short time trip
- Real-time system visibility and monitoring
- Late point identification for fast, flexible design and installation
- Comprehensive arc flash energy safety

For complete details, call 1-877-259-0941, ext. 2912 or e-mail us at marketingcdn@ge.com. www.gelighting.com



Silver Grip® Tray/Cord Fitting

ONE HECK OF A GRIP!

Now available in 2-1/2 and 3-inch hub sizes.

- Efficient strain relief for portable cord and tray cable in hazardous locations
- Designed for use in Class I, Gas and Vapour Environments
- Corrosion-resistant, non-magnetic aluminum construction
- Tapered neoprene bushing and O-ring seal out moisture and dirt ingress
- Chuck grip provides superior mechanical pull-out performance
- Hand-tightens — no tools required



www.tnb-canada.com

Thomas&Betts

Blackburn® Ground Rods

Latest addition to T&B grounding offering.

- Hot dipped galvanized steel
- Copper bonded steel
- Sectional copper bonded steel
- Wide range of diameters and lengths
- Complete range of accessories

www.tnb-canada.com

Thomas&Betts



WANTED

Molded Case Circuit Breakers. New & Used, All Brands.
 Motor Control & MCC. Buckets in A&B, S.D. & W.H. & C.H.

Please call, email or fax Ralph Falvo with your list.

FALVO ELECTRICAL SUPPLY LTD.

5838-87A St., Edmonton, Alberta
 1-800-661-8892
 780-466-8078 Fax 780-468-1181
 email: rjf@falvo.com



on Engineering Services:

- Electrical Utility Audits
- Professional Development & Training
- Electrical Fire & Accident Investigations
- Quality Management Consulting & Auditing

L. Stoch and Associates
 Mississauga, Ontario, Canada.
 (905) 828-2262 Fax: (905) 828-2526
 eMail: lstoch.associates@sympatico.ca
 Website: www.lstoch.com

LOADBANKS for RENT

600V,480V & 208V Genset load testing and UPS load testing equipment. Metering, Cables and tech support available. Shipped anywhere.

Call 1-800-385-4421 for rates.

WE BUY AND SELL GENERATORS



POWER SYSTEMS
 Electric Power Generating Equipment Inc.
 www.raylewpower.com

Questioning your Noisy Bathroom Fan?



Aeroflo has the answers!

AeroFan Bathroom Ventilation Fans are engineered to provide superior ventilation and reliable service, combined with quiet and efficient 2-speed operation. Available in lighted or non-lighted versions, **AeroFans** will compliment any bathroom décor with their attractive and modern design.

Aeroflo offers a superior line of ventilation products and air purification systems, providing*better AIRFLOW by DESIGN!*™

Tel: 905-890-6192
 Toll: 800-779-4021
 Web: www.aeroflo.com



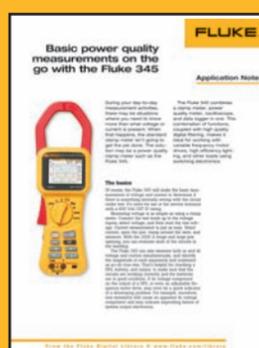
THE **BENCHMARK** IN **ELECTRICAL SAFETY INFORMATION**

Services:

- Electrical Industry Consulting
- Training Development
- Electrical Safety Assessments
- Benchmarking
- Feasibility Studies

training assessments consulting

Contact
 Kris Paszkowiak, P.ENG.
 Phone: (905) 599-2702
 eMail: kris.paszkowiak@gmail.com



Learn about Basic Power Quality Measurements on the go with the New Fluke 345 Power Quality clamp meter
 When you're taking your day-to-day measurements, a standard clamp meter won't help you when you need to know more than what voltage or current is present. This new Fluke 345 combines a clamp meter, power quality meter, oscilloscope and data logger in one. This combination of functions coupled with high quality digital filtering is ideal for working with variable frequency motor drives, high efficiency lighting and other loads using switching electronics.

Call 1-800-363-5853 for this application note.



The importance of tree and vegetation management

To ensure public safety as well as the reliable operation of the system, local supply authorities must maintain adequate clearance around their overhead power distribution lines. Any loss of electricity supply is, at best, inconvenient, while any prolonged interruption can cause significant disruptions to customers. So we count on our local supply authorities to ensure the continuity and reliability of supply.

Trees near overhead lines can interfere with the electricity supply, especially in severe weather conditions. It is vital that local supply authorities manage vegetation growth to minimize potential problems. Tree trimming cycles vary depending on the extent of storm damage, and overall health of the vegetation and its type. The electrical safety and reliability concerns apply in the same way to privately owned distribution lines. Private property owners are responsible for both trimming and tree/brush removal around service lines that are less than 750 volts, as well as around overhead power lines over 750 volts.

Clearances must conform to requirements in the 2009 CEC. (The Ontario Electrical Safety Code, Rule 75-326 Tree Trimming, says the owner of a private line shall provide complete protection clearance to the line from trees and other forms of woody growth in compliance with a code or standard under a rule or by-law of the supply authority



concerning tree trimming. This would be an excellent rule to enhance the 2009 CEC.)

In cases where there is no applicable code or standard under a rule or by-law of the supply authority concerning tree trimming, all trees and woody growth adjacent to a line must be trimmed so that minimum clearance to the nearest conductor horizontally under at maximum conductor swing, and vertically at a maximum sag, shall be a) 1 m for secondary lines and b) 4 m for primary lines.

This requirement means that private property owners must keep sufficient distance between trees and overhead power lines to avoid interference with supply, thereby improving public safety and supply reliability. It also means that more extensive tree cutting should be carried out in many private areas, even though there are no regulations on the matter.

Any tree that has grown into power lines demands immediate attention, though the trimming should be left to professionals. Cutting trees in proximity to energized power lines can be very dangerous when you're not trained in this kind of work. Only qualified and skilled contractors should be pruning or removing trees and branches; they have the required skills and tools for this undertaking.

Electrical safety and local supply authorities have, unfortunately, many examples showing what happens when homeowners and/or other well-meaning but otherwise unqualified people attempt this dangerous job. They are frequently seriously injured or outright killed—usually because they've lost control over a falling branch or tree that results in an electrical contact with the energized power line, or from the ensuing fall. In addition, there's also the increased risk of injury when using tools such as chainsaws.

Private property owners should contact the local supply authority or hire a qualified contractor when they see any of these hazardous conditions:

- trees/branches are smoking, sparking or burning;
- tree is an immediate hazard to the power line were it to split, lean or hang over; or,
- the property experiences nuisance fuse tripping due to branches making contact with the power line.

The local supply authority should be contacted to disconnect the power line prior to doing any work.

Were it not for the fact that we value trees and vegetation (be it for aesthetics, wildlife habitat, etc.), we could go ahead and just destroy them altogether. However, adhering to prudent tree trimming requirements and applying a few simple precautions will eliminate any safety hazards and ensure reliable supply while maintaining the natural environment. **EB**

Kris Paszkowiak is principal of CodeSafety Associates, a consulting firm serving the needs of the electrical industry. He holds a Master Electrician licence and has served numerous organizations over the years, including the Canadian Advisory Council on Electrical Safety, Committee on CEC Part I and UL Electrical Council. E-mail CodeSafety Associates at kris.paszковиak@codesafety.ca.



Questions and answers compiled by the Electrical Safety Authority



Tackle the Code Conundrum... if you dare

So, you think you know the electrical code, eh? Well, we'll soon find out if you're an electrical code junkie or downright code-clueless. Take a look at the following questions and check your answers in February's *Electrical Business*.

How did you do?

- 3 of 3** — Not only are you smart, you love to show off.
- 2 of 3** — You're pretty smart, but you still missed one.
- 1 of 3** — Your understanding of these questions is not up to code.
- 0 of 3** — Did you come up with your answers by playing Eenie, Meenie, Minie, Moe?

Question 1

Tungsten halogen luminaires with double-ended lamp holders—having an input voltage of not more than 240V—shall be permitted to be connected to a branch circuit protected by overcurrent devices rated or set at not more than ___ amps in dwelling units.

- a) 50 c) 30
- b) 20 d) 40

Question 2

The bending radius for a tape-shielded high-voltage cable that has a diameter of 1.5 in. shall be not less than:

- a) 6 in. c) 18 in.
- b) 12 in. d) 24 in.

Question 3

Type SJ cord shall be permitted to be used on portable lamps and equipment in motion picture studios.

- a) True
- b) False

Answers to Code Conundrum

Electrical Business November/December 2008

Q-1: A splitter with a separate screw or stud for each connection shall be installed, in an accessible location, where two or more conductors are connected to a conductor larger than No. 6 AWG copper or No. 4 AWG aluminum.

a) True. Rule 12-2000(6).

Q-2: At least ___ mm of free conductor shall be left at each outlet for making a joint or fixture connection, unless the conductor is intended to loop through lamp holders, receptacles or similar devices without joints.

b) 150 mm. Rule 12-3000(5).

Q-3: Solid-state devices shall be permitted to be used as isolating switches or as disconnecting means.

a) False. Rule 14-700.

ADVERTISER INDEX

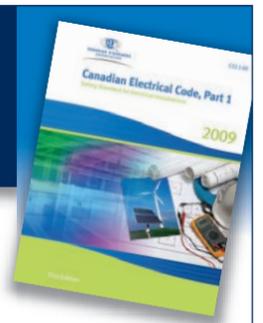
Advertiser	Page
Aeroflo Inc.	25
Arlington Industries	19
Brady Canada	22
Caterpillar	17
CodeSafety Associates	25
CSA	26, 27
Falvo	25
FLIR Systems	18
Fluke Canada	25
GE Consumer and Industrial	25
Hammond Mfg.	12
Home Energy Solutions	25
Hubbell Canada	6
Hubbell Lighting	15
I.E.D. Limited Partnership	13
L. Stoch and Associates	25
Leviton Mfg.	16
Merit Canada	24
NETcomm	23
Nexans Canada	1
Northern Cables	7
Raylaw	25
Scotiabank	11
Standard Products	2
Thomas & Betts	1, 5, 25
Venture Lighting	28
Waltech Associates	25
WEG Motors & Drives/VJ Pamensky	4



The 2009 Canadian Electrical Code is Now Available!

Incorporates 108 revisions and 14 NEW interpretations.

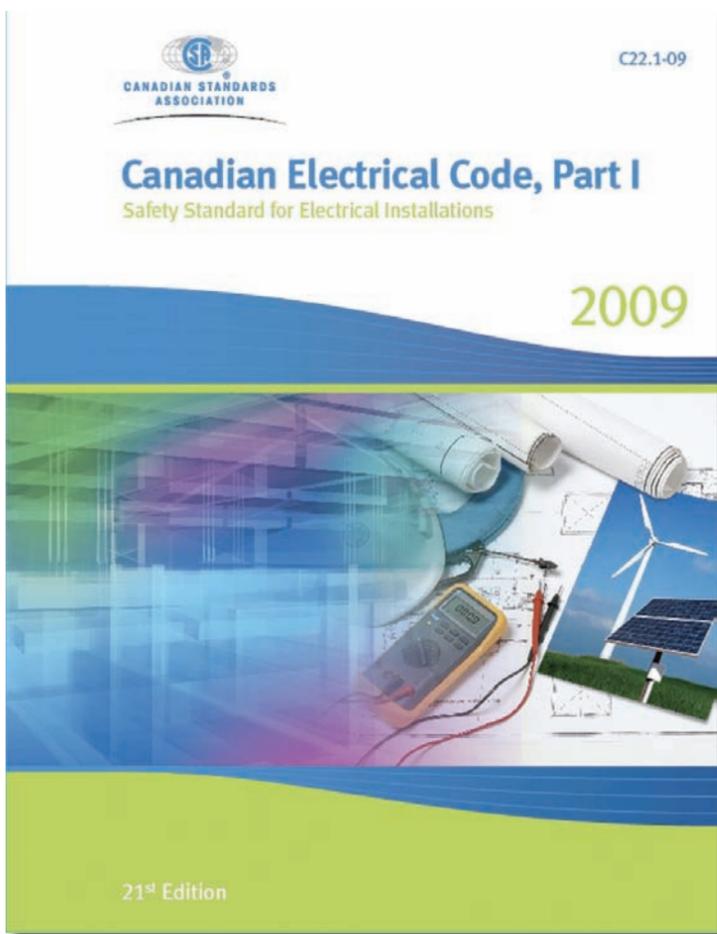
Buy yours at <http://cecode.csa.ca>





CANADIAN STANDARDS
ASSOCIATION

CSA... keeping you current with Electrical Safety Standards



2009 Canadian Electrical Code

NOW AVAILABLE

Since 1927, CSA's Canadian Electrical Code Part I has provided the signature standards for addressing shock and fire hazards of electrical installations in Canada.

The 21st version of the Canadian Electrical Code was developed through the most extensive review ever, incorporating 108 revisions and 14 new interpretations. By meeting these standards, you will help ensure the safety of those who rely on your expertise.

STAY CURRENT! ORDER YOURS TODAY!

VISIT
cecode.csa.ca

CSA is... Standards & So Much More!

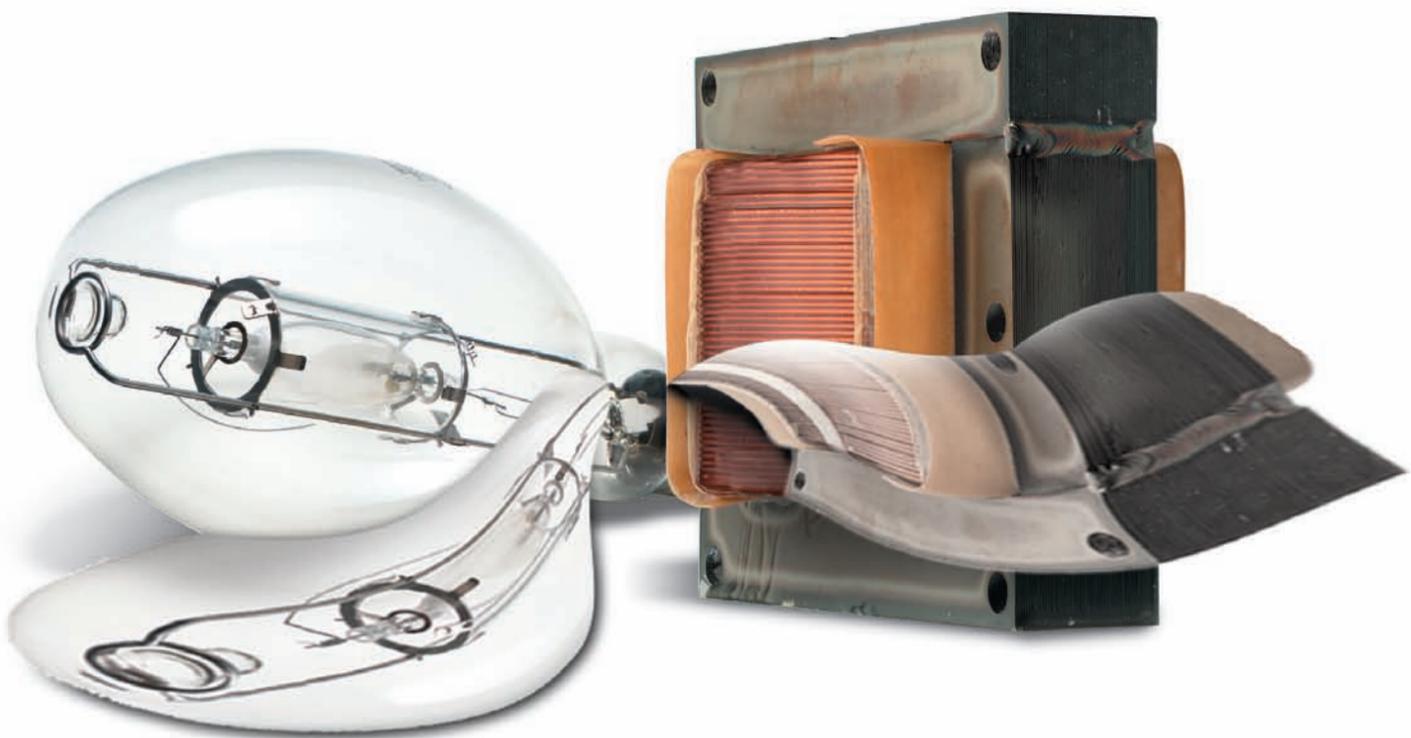
CSA offers practical handbooks, guides, self assessment checklists, electronic tools, smart standards – plus convenient access to a wealth of standards-related training resources, including “CE Code Essentials” training. Many of our products can be customized to your unique requirements.

Purchase the
2009 CE Code at select
Mark's Work Wearhouse
stores *(Limited time only)*



VENTURE LIGHTING®

You Can't Trust Every Brand by Its Cover



When It's Metal Halide, Make Sure It's Venture

Ballastronix inc.®
by  **VENTURE™**



Accept no imitations. As the world leader in pulse start technology, Venture produces high quality lamps and ballasts that are more efficient than others. Don't settle for less than best, demand *Venture Lighting* products!

Venture Lighting® products are available from electrical and lighting distributors across Canada. Contact your local sales agent. Visit our website to find an agent near you.

VentureLighting.com/Canada



VENTURE®
LIGHTING