A CLB MEDIA INC. PUBLICATION • NOVEMBER/DECEMBER 2007 • VOLUME 43 • ISSUE 10

Electrical Business

THE AUTHORITATIVE VOICE OF CANADA'S ELECTRICAL INDUSTRY

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Electrical Business

THE AUTHORITATIVE VOICE OF CANADA'S ELECTRICAL INDUSTRY

November/December 2007
Volume 43 • Issue 10

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.

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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

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." Canada

American ABP Business Press · Electro-Federation Canada · Member ebp Canadian Business Press · CCAB BPA Worldwide Business

▼ From the editor

What about those other guys? You know... the distributors

Here in the pages of Electrical Business we regularly publish information regarding apprenticeship and apprentices in Canada, with a specific eye toward what's happening in the field of electrical work. By all accounts, electrical remains a popular choice among folks choosing to get into a skilled trade (it remains "glamorous" in the eyes of many, even though we all know it can be quite the opposite at times).

So despite the inevitable poaching that occurs across companies, and with seasoned veterans reaching retirement age (and, of course, retiring), electrical contractors continue to enjoy a steady flow of new blood into the industry. But what about those other guys? You know, the distributors?

You will recall from our March 2007 edition, Tom Crist (EECOL's president and CEO) explained that—especially in hot economies like Alberta and British Columbia—poaching is a real problem. "In fact, I haven't seen it this bad in my 35 years in the industry," he went on to say. Distributors, too, face the problem of veterans retiring from the business but, unlike the contractors they serve, they have a much tougher time attracting new blood.

Perhaps working the counter doesn't come across as glamorous as being an electrician, or perhaps it is seen as a dead-end job (which it shouldn't, considering Crist started with EECOL as a warehouse person/truck driver), but whatever the real reason/reasons, distributors have a tough road ahead of them.

This is why EB—along with our sponsoring partner, Osram Sylvania—launched a special column last month entitled "Counter Intelligence", in an effort to help our industry's distributor partners with their Human Resources and business issues. (It continues in this edition.)

A strong distributor is a valued partner, as he provides the advice, the credit, and the products and solutions electrical contractors need to get the job done. Sure, we live in "The Information Age", where everything we could ever possibly want to know is supposedly located somewhere on that thing called the Internet. And it's true: the Internet *does* have a ton of information; in fact, more than we know what to do with. It's information overload, with a healthy dose of misinformation to boot.

That's why, time and again, we turn to our distributor partners for advice, guidance, suggestions and recommendations. They give us the information *we need to know*.

And sure, sometimes we get our wires crossed; other times we get mad at each other. But it doesn't change the fact that we need them as much as they need us. EB

Anthony Capkun

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HD Supply recently honoured its Suppliers of the Year at the 2007 HD Supply Supplier Conference. The awards acknowledge businesses providing critical services to one or more of HD Supply's 12 lines of business. Among the recipients were **Canlyte Inc.** (Canada), **Eaton Electrical Inc.** (Electrical), **General Cable** (Utilities), **Philips Lighting Co.** (Facilities Maintenance) and **Cooper Crouse-Hinds**.


Pascale Daviau

Michael Kenney, president of **Thomas & Betts Canada**, announced the recent appointment of **Pascale Daviau** to the position of director, business development and product innovation. A member of the Thomas & Betts Canada family since 1987, Daviau has occupied a number of key roles within the organization, including director of marketing and, most recently, director of business development. In this newly expanded role, she will work closely with product engineering, technical documentation and technical liaison to direct the product development and execution process, ensuring the timely introduction of new products and services to customers, end-users and specifiers.


P&S's Jack Wells (centre) is the first recipient of ANSI's Elihu Thomson Electrotechnology Medal.

The **American National Standards Institute (ANSI)** named **Jack Wells** of **Pass & Seymour/Legrand (P&S)** the first recipient of its Elihu Thomson Electrotechnology Medal, which recognizes an individual who has contributed in an exceptional, dedicated way to the field of electrotechnology standardization, conformity assessment and related activities both at the national and international levels. "Jack has worked tirelessly to manage industry relations and improve codes and standards, and he's become a respected resource throughout the electrical world," said **Mike Gambino**, president and CEO of Electrical Wiring Systems, Legrand NA.

Power Distribution Inc. (PDI)—a designer, manufacturer and servicer of power distribution/monitoring and static switching equipment—announced **Keith Schmid** as its CEO, replacing **Rich Combs** who will serve as executive chair. Schmid comes to PDI from Exide Technologies where he served as general manager of Exide Industrial Energy–Americas. Prior to Exide, Schmid was at GNB Technologies, Philips Consumer Communications, AT&T/Lucent Power Systems and AT&T Bell Laboratories.


Didier Pfleger

Didier Pfleger has joined international engineering and project management company, **AMEC**, as COO, Power and Process, and was appointed to the management committee. He joined the company from ABB's Robotics division, where he served as head of Business Unit Systems. 2007 marks AMEC's 100-year anniversary in Canada, where the company has about 5000 employees operating from 74 offices. EB

One lighting giant acquiring another: Philips and Genlyte

Royal Philips Electronics has entered into a definitive merger agreement with North American luminaires company Genlyte Group Inc., in which Philips will commence a tender offer to acquire all of the issued and outstanding shares of Genlyte for about $2.7 billion USD (to be paid in cash upon completion). The proposed transaction builds on Philips' earlier acquisition of Color Kinetics (now Philips SSL Solutions, below).

Genlyte designs, manufactures and sells lighting fixtures, controls and related products for a variety of applications. Just under 90% of its 2006 revenues were related to commercial and industrial applications, with the remainder in high-end residential applications. Genlyte sells its products under the major brand names of Alkco, Allscape, Ardee, Canlyte, Capri/Omega, Carsonite, Chloride Systems, Crescent, D'ac, Day-Brite, Gardco, Guth, Hadco, Hanover Lantern, High-Lites, Hoffmeister, Lam, Ledalite, Lightolier, Lightolier Controls, Lumec, Morlite, Nessen, Quality, Shakespeare Composite Structures, Specialty, Stonco, Strand, Thomas Lighting, Thomas Lighting Canada, Vari-Lite, Vista and Wide-Lite.

Meantime, Philips Solid-State Lighting Solutions (mentioned above) has been awarded a $250,000-contract by U.S. federal agency National Institute of Standards and Technology (NIST) to develop and create a new test system to improve methods for calculating and measuring the quality of a light source.

Under the contract, Philips SSL Solutions is charged with developing light sources capable of producing a range of spectral power distributions within the visible spectrum for testing, evaluating and/or establishing colourimetric and photometric metrics. This spectrally tunable light source will be capable of simulating various types of existing lamps and conceivable white LED light sources, allowing for an accurate measure of how a light source would render colours. This should, in turn, allow manufacturers to adopt an accurate and consistent ratings system that helps lighting professionals better evaluate and compare lamps and luminaires, including LEDs.

STESI, Tiltran and Lizco: The Three Musketeers?

St. Thomas Holding Inc.—wholly owned by the City of St. Thomas, Ont., and owner and operator of St. Thomas Energy Services Inc. (STESI)—has entered into an agreement to purchase the shares of two companies near the Town of Tillsonburg, Ont.: Tiltran Services and Lizco Sales.

Tiltran specializes in the engineering, construction and maintenance of high-voltage electrical power systems, while Lizco boasts having the largest, privately owned transformer inventory in Canada. This is the first transaction of its size in the province involving a municipally owned utility company purchasing a competitive, privately owned services company, say the companies.

"We made the decision to purchase Tiltran and Lizco because it makes good business sense," said Brian Hollywood, STESI president and CEO. "We have always been an innovator in finding ways to secure new revenue streams and this purchase allows us to continue to be aggressive in new business development."

Following the purchase, Tiltran, Lizco and STESI will operate as separate companies, sharing knowledge-based resources when opportunities arise to provide growth and stability for all. Together, the companies now have the opportunity to gain access to broader markets and larger projects.

"By joining with STESI, we have given Tiltran and Lizco employees an opportunity for further growth, success and security," said Pat Carroll, Tiltran president. STESI management has assured its roughly 22 unionized employees there will be no jobs, work or contract leakage to Tiltran or Lizco as a result of this acquisition. Additionally, the more than 55 non-unionized Tiltran and Lizco employees have been informed there will be no job losses as a result of the purchase. The transaction should be complete by January 2.

Perspectives on registered male/female apprentices

Registrations for apprenticeship training programs increased in all major trade groups in 2005, says StatsCan, with the largest gains occurring in the building construction trades group, thanks to Canada's construction boom. In addition, women are gaining ground in apprenticeship training and, in 2005, they accounted for almost 1 out of every 10 people who registered for training.

Total registrations hit 293,835, up 9.7% from 2004 and the biggest single-year increase since 1995. In the building construction trades group, 68,705 people registered for training—an increase of nearly 8100 from 2004. Registrations rose by just over 4000 in the electrical, electronics and related trades group.

British Columbia saw the greatest increase in registrations over 2004, at 20.5%, with Alberta and the Yukon both at over 12%, and Ontario at 10%. Quebec accounted for most of the increase in the building construction trades, with 3470 new apprentices, followed by British Columbia with 2230, and Ontario with 1695.

In 2005, municipalities issued a record amount of over $60 billion in permits for residential and non-residential construction. It was the 10th consecutive year of increases in building construction permits, and registered apprenticeship numbers followed closely, with increases over a similar number of years.

Completions of apprenticeship training have also been on the rise, hitting a high of 20,555 in 2005, up 4.3% from 2004. Four trade groups accounted for three-quarters of completions. Those in the metal fabricating trades accounted for 23% of the total—the highest proportion. This was followed by the motor vehicle and heavy equipment trades group at 21.7%, the electrical, electronics and related trades group at 18.3%, and the building construction trades group at 14.4%.

The two provinces and territory with the greatest increase in completers in 2005 were Newfoundland and Labrador at 26.9%, British Columbia at 24.8% and The Yukon at just over 24%. The largest increase in numbers occurred in Quebec (+295) in the building construction trades and in Alberta (+170) in the electrical, electronics and related trades.

Registrations among women on the rise

Between 1992 and 2005, registrations by women in registered apprenticeship training more than tripled, from 8225 to 28,755. Since 1998, they have more than doubled. In 2005, women accounted for 9.8% of total apprentices, double the proportion of 4.5% in 1992. However, while women's registrations have increased in every major trade group, their numbers are still low, with one exception: 17,530 women registered for training in the food and services trades, where they accounted for 63.8% of total registrations in 2005.

Men vastly outnumbered women in other trades. For example, women accounted for only 3% of registrations in the building construction trades, the largest proportion after that of the food and services trades group, and 2.4% in both the electrical, electronics and related trades, and the motor vehicle and heavy equipment trades. Men also vastly outnumbered women when it came to completing programs; of the 20,555 completions in 2005, women accounted for 10.8%, or only 2225. However, this was double their proportion of 5.5% in 1992.

Women also accounted for most of the growth in the 9.8% increase in the number of completions between 1992 and 2005. During this period, the number of men who finished their training program rose by only 640, while the number of women more than doubled from 1030 to 2225.

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INFO NO. 5

Winners of EB'S August 2007 Photo Contest

Electrical Business is pleased to announce the winners of the Heritage "What Am I?" Photo Contest for the August 2007 edition, who correctly identified the mystery heritage item on page 6 as the Greenlee #750 chain pull drill. The winners are:

- John Caldicott, Retired (Powell River, B.C.)
- Sam Cocuzzi, ESA (Woodbridge, Ont.)
- Robert Fournier, R.J. Fournier Electric Inc. (Essex, Ont.)
- Scott Little, Little Electric Inc. (Cambridge, Ont.)
- Jim Murphy, Jim Murphy Electric (Perth, Ont.)
- Ronald Riedel, IBR (Surrey, B.C.)
- Michael Shea, City of Victoria (Victoria, B.C.)
- Kenneth Todd, KT Industries (Red Deer, Alta.)
- Jim Vey, S Electrical Services Ltd. (Maple Ridge, B.C.)

Electrical Business launched the photo contest in the August 2007 edition, in cooperation with the Electrical Heritage Society of British Columbia as well as generous industry partners. In this contest, readers guess the nature of an electrical artifact from the society's collection to win cool prizes—in this case, an LVD2 Volt Light courtesy of our friends at Fluke Electronics Canada.

Women in apprenticeship training younger than men

Women who register for apprenticeship training in trades are, on average, younger than their male counterparts. In 1992, the average age for women in apprenticeship training was 28. By 2005, this had increased to 29. On the other hand, men in apprenticeship training in 1992 were 29, on average, and 30 by 2005.

At the other end of the scale, the oldest women—with an average age of 33—were registered in the building construction trades group. For men, the oldest—with an average age of 31—were in the building construction trades, and industrial and related mechanical trades.

In 2005, the biggest proportion of women in apprenticeship training (30.9%) was in the 20-to-24 age group. Combined with the under-20 age group, they account for 42.5% of all women participants, compared with 34.5% for men. The biggest proportion of men was also in the 20-to-24 age group. Between 1992 and 2005, the most significant changes in the number of women in apprenticeship training programs by age group occurred among the youngest and oldest. The number in the under-20 age group surged from 475 in 1992 to 3325 in 2005. The number in the 50-plus age group rose from 100 to 1050.

The case was similar for men. Their most significant growth occurred in the under-20 age group, where the numbers rose from 3570 in 1992 to 19,870 in 2005. Among program completers, 43.9% of women were aged 20 to 24—the highest proportion. In contrast, only 21.1% of male completers were in this age group. The biggest proportion of male completers was in the 25-to-29 age group.

BCEA donates $25K to Camosun College

The Camosun College Foundation received a donation of $25,000 from the British Columbia Electrical Association (BCEA) in support of the college's electrical trades students and electronics engineering technology students. ▶

PHOTO CONTEST

Electrical Business, in association with the Electrical Heritage Society of British Columbia—along with generous industry partners—is excited to present the Heritage "What Am I?" PHOTO CONTEST.

Pictured on the left is an item from the heritage society's collection of electrical artifacts. The contest begins when you think you know what this item is. Of course, we're not going to show the item in its entirety—that would be too easy! (You'll have to wait until next month to see the whole picture, as well as the correct answer.)

Here's how to play

Visit EBMag.com where you'll find an entry form along with a multiple choice answer form. If you've answered correctly, your name will be added to all the other correct entries, from which 10 winners will be randomly chosen before next month's installment of the "Heritage What Am I?" Photo Contest. Read the small print below for more information. Good luck!

This month's awesome prize!

This month's awesome prize was donated by our friends at Thomas & Betts. We have one (1) Ty-Rap cable tie installation tool up for grabs. The heavy-duty ERG120 (for 50 lb to 120 lb cable ties) aims to be the most ergonomic and efficient of its kind on the market, with a 360° rotating nose providing flexibility in numerous positions and an adjustable grip that adapts to fit both large or small hands. A flush tail-to-head cut-off eliminates sharp cable tie ends that can cut or scratch you or nearby equipment/wiring, while a long stroke length (1 in.) means fewer handle tensioning cycles. (Prize not exactly as shown in photo).

Last month's photo: answer

Pictured here is a Westinghouse **Series Transformer** (a.k.a. 'CT' or current transformer) for measuring AC current (400:5 max ratio). Winner to be announced.

No purchase necessary. Open to residents of Canada of age of majority, excluding Quebec. You must answer a timed skill-testing question to win. Prize valued at about $260.00. The contest is not open to anyone affiliated with, or related to, members of Electrical Business or the Electrical Heritage Society of British Columbia. (That would be unfair.) Complete contest details online at EBMag.com.

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"BCEA aims to give back whenever we can, and this is one way of helping students pursuing a career in the electrical field," said BCEA executive director, Barbette Cejalvo. "They are the future of our association and will become the backbone our industry."

The endowment will annually generate two $1000 bursaries for one student in the first year of the Electrical Trades program and one student in the Electronics Engineering Technology program.

"Camosun College has a strong partnership with BCEA in jointly coordinating training for the electrical industry," said Kari Frazer, development officer at Camosun. Susan Haddon, executive director of the Camosun College Foundation, accepted the donation at the opening session of BCEA's Electrix in Victoria. Haddon thanked BCEA for its donation and announced the college had topped the donation with $5000, making the endowment fund a total of $30,000.

For more information about BCEA Scholarships and Endowments, visit www.bcea.bc.ca.

The Island goes further to protect hearing

Recently approved amendments to Prince Edward Island's Occupational Health and Safety Act, Noise and Confined Space regulations, are now in place and designed to help prevent hearing loss due to noisy workplaces. The Noise amendments include requirements for a hearing protection program in the workplace, including noise measurement, education and training, engineered noise control, hearing protection, posting of noise hazard areas, hearing tests and an annual program review.

The Confined Space amendment expands the definition of "confined space" and provides greater clarity to OHS training providers and industry stakeholders on what is considered a confined space.

"Prevention is the most effective way to minimize the overall emotional, physical and financial burden of workplace injuries," said Carolyn Bertram, minister of communities, cultural affairs and labour. "These positive changes to our Occupational Health and Safety Act regulations ensure greater protection for Island workers and employers in regard to workplace health and safety standards."

Educational grant program donates multimeters

The 287 and 289 DMMs "are the perfect tools for students", said David Green, director of marketing and education programs at Fluke Canada. "Their features and capabilities allow students to make the measurements and solve the problems that they will face when they are in the workforce."

Fluke Electronics Canada has announced it will donate over $23,000 worth of digital multimeters for students in Industrial and Electronics programs through the Fluke Education Grant Program.

Instructors in accredited programs can apply for separate grants of the new Fluke 287 and 289 True-rms logging multimeters with TrendCapture; 10 winners will be selected to receive Fluke 287 meters, and 10 Fluke 289 meters. Each will receive a grant of two (2) Fluke digital multimeters. The 287 and 289 retail for $565 and $599, respectively.

Grant applications will be reviewed by a committee from Fluke Canada for program elements including breadth of course offering, degree/certification qualifications granted, statistics and plans for using the Fluke DMMs within the curriculum and reasons for receiving the grant. The winning institutions will be announced in February 2008.

Instructor applicants must be registered on the Fluke Education partnership program. Members of the Fluke Educators Partnership Program can apply for the grant by completing the grant application forms available online at www.flukecanada.ca/Education. Membership is free *but hurry*: the **deadline for applications is January 31**.

P&S files GFCI patent infringement lawsuit against Hubbell

Pass & Seymour/Legrand (P&S) announced the filing of a patent infringement lawsuit concerning GFCIs against Hubbell Inc. (Orange, Conn.) in the U.S. District Court for the Northern District of New York. The complaint alleges that Hubbell has infringed 15 U.S. patents by selling several different GFCIs. The patents relate to various proprietary safety features invented by P&S and incorporated into GFCIs sold by P&S.

In addition to an award of unspecified damages, P&S seeks a court-ordered injunction against Hubbell to prohibit making, using, importing, offering for sale and selling the infringing GFCIs. An injunction would be effective against Hubbell and anyone in active concert or participation with Hubbell who receives notice of the order, such as distributors who resell the infringing devices and contractors who use or install them.

IEEE relays/underground cables and substation transformer standards

The IEEE (Institute of Electrical and Electronics Engineers Inc.) has approved standards regarding protective relays on distribution lines, Ragowski Coils for protective relaying and concentric neutral corrosion in underground cable. It has also approved a substation transformer standard, and has begun work on a test standard for partial discharge measurements and approved revisions to two other standards.

- IEEE C37.230, Guide for Protective Relay Applications to Distribution Lines, examines the advantages/disadvantages of ways to protect electric power distribution systems. It looks at the fundamentals of this topic, line configurations and schemes, and identifies problems and solutions with the methods used in distribution line protection.
- IEEE C37.235, Guide for the Application of Rogowski Coils Used for Protective Relaying Purposes, is the first guide on this topic. It establishes criteria and requirements for applying Rogowski Coils (RC) in electric power systems and provides requirements for the performance, operation, testing, safety considerations and maintenance of RC-based current transducers.
- IEEE 1617, Guide for Detection, Mitigation and Control of Concentric Neutral Corrosion in Medium Voltage Underground Cables, includes discussion of the consequences of significant loss of the concentric neutral and recommendations for mitigating and controlling cable concentric neutral corrosion. ▶

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DODGE

INFO NO. 10

- Work has started on IEEE PC37.301, Standard for High-Voltage Test Techniques: Partial Discharge Measurements, which applies to equipment and components rated 1000V, including fuses, switches, circuit breakers and pad-mounted switchgear.
- IEEE C37.20.7, Guide for Testing Metal-Enclosed Switchgear Rated Up to 38kV for Internal Arcing Faults, has been revised to harmonize with IEC documents, correct inconsistencies in the procedure, and add an application guide as an annex. Its scope was extended to cover low-voltage, metal-enclosed AC power circuit-breaker switchgear. The standard applies to arcing faults entirely in air within the enclosure.
- Also revised was IEEE 532, Guide for Selecting and Testing Jackets for Power, Instrumentation and Control Cables, to bring it up to date with current technology. In addition to helping users select jackets and protective covers to optimize cable installations, it also reviews the types and rules of jackets.
- IEEE also has confirmed the continued use of IEEE C37.09, Standard Test Procedure for AC High-Voltage Circuit Breakers Rated on a Symmetrical Current Basis, and IEEE C37.20.1, Standard for Metal-Enclosed Low-Voltage Power Circuit Breaker Switchgear.
- The association has also approved IEEE C57.12.36, Standard Requirements for Liquid-Immersed Distribution Substation Transformers, which covers selected electrical, dimensional and mechanical characteristics of these transformers. It clarifies requirements for this class of transformers by combining selected distribution requirements from IEEE C57.12.34 and selected product specifications from IEEE C57.12.10, so users and manufacturers have a single location for all requirements.
- IEEE has also begun revising its guide for direct lightning stroke shielding of substations to bring it in line with current technology, and has started work on IEEE P525-2007/Cor 1, Guide for the Design and Installation of Cable Systems in Substations: Corrigendum 1, to correct elements of this standard.

Eaton Corp. acquires Babco Electric Group

Eaton Corp. just announced it has acquired the assets of Alberta-based Babco Electric Group. Babco manufactures specialty low- and medium-voltage switchgear and electrical housings for use in the Canadian oil and gas industry, as well as other harsh environments. The company had sales of $11 million in the fiscal year ended April 30, 2007.

"This acquisition increases our capabilities within the Alberta marketplace and demonstrates our commitment to support the growth of our local customers," said Steve Boccadoro, Eaton's Electrical Group's (Canada) vice-president and GM. "It also provides us with additional manufacturing capacity to enhance the level of service for our customers across Canada."

Coleman to acquire Katy's electrical products business

Coleman Cable Inc.—a manufacturer of electrical and electronic wire and cable products—has entered into a definitive agreement to acquire the electrical products business of Katy Industries Inc., which operates as Woods Industries (Canada) Inc. in Canada. Its principal business is the design and distribution of consumer electrical corded products. Coleman expects to derive additional benefits from the acquisition over time through cross-selling opportunities, logistics and purchasing synergies, and the implementation of best practices throughout the entire organization.

Ontario aims to be solar energy hot spot

Ontario is increasing its use of solar energy, with over 100 contracts signed for potential solar energy projects across the province ranging from residential systems to large-scale solar farms. Now Ontario's businesses, industries and institutions have another incentive to get in on the action: a program that will provide them with up to $80,000 to install solar heating systems.

The Ontario Solar Thermal Heating Incentive matches rebates provided by the federal ecoENERGY for Renewable Heat program. Each program provides up to 25% of the cost of purchasing and installing a solar hot water/air heating system, to a maximum of $80,000.

Gerry Phillips, Ontario's new energy minister, has announced an agreement with the federal government that will help the province implement this four-year, $14.4-million rebate program in conjunction with Natural Resources Canada (NRCan).

To participate in the Ontario Solar Thermal Heating Incentive, applicants must apply through the federal ecoENERGY for Renewable Heat program. The province's program applies to those Ontario applications submitted to the federal program on or after June 20, 2007. Interested applicants should first visit www.ecoaction.gc.ca (NRCan's ecoACTION website) or call NRCan at (877) 722-6600. Then, more information about Ontario's matching incentive can be found on the Ministry of Energy website at www.energy.gov.on.ca or by calling (888) 668-4636.

Leviton unveils new branding venture

"We have one of the most valuable and recognizable brands in our industry," said Donald J. Hendler, Leviton's president and CEO. "We intend to build on our past legacy of pioneering innovation and establish a strong emotional connection with the many audience groups we serve."

Leviton Manufacturing recently unveiled a major rebranding initiative that, says the company, reflects a shift toward a more progressive identity. Central to the initiative is the replacement of the company's all-blue "Building a connected world" logo with a motif that highlights the "ON" in the Leviton name in a bright green colour field. The company says the new brand identity resonated strongly in focus groups consisting of diverse market segments (i.e. electrical contractors, distributors, interior designers and consumers).

Schreder Lighting USA established

Schréder Group G.I.E., a Belgian architectural outdoor lighting player, has established Schréder Lighting USA in Chicago, Ill. It is the latest member of The Schréder Group G.I.E., which comprises over 40 group members within 36 countries and four continents. The Chicago facility includes offices and training session rooms, with a product showroom and tunnel lighting laboratory in development.

"The establishment of our newest group member in the United States will complement our existing Canadian operation in establishing the Schréder brand throughout North America," said Francis Schréder, board member of Schréder Group G.I.E. EB

Wind power generation does not get a free pass in Quebec

Although wind power generation seems the ideal 'green' solution, and complementary to the 'blue' source the world over, many groups in Quebec are strongly opposed to most wind projects under development.

Various environmental groups have carried out studies showing there are, in fact, many disadvantages to wind power generation; enough to lobby municipalities and the Ministry of the Environment to hold a moratorium on wind projects across the province. Studies show that the windmills kill a large number of birds, and the various noises they produce (via the blades, generator, etc.) chase away wildlife. Their visual impact is also an issue, which is why it is prohibited to erect wind turbines between the St. Lawrence River and Highway 20.

The Quebec Federation of Municipalities (FQM) passed a motion this summer asking the provincial government to dictate a minimum financial contribution that wind power generation corporations are to pay municipalities where wind turbines are to be installed—be they on public or private lands. The rock-bottom price, as per FQM, should be $4000 per megawatt-capacity installed. In Longueuil, the fourth largest city in the province (with its 400,000 citizens on the south shore of Montreal), city council passed a regulation earlier this summer prohibiting the erection of any wind turbine on its urban territory (whether commercial or private).

Meantime, Hydro-Quebec has called for tenders to get projects amounting to 2000 megawatts of wind-generated electricity, a large portion of which would be granted to municipally and First Nations-owned projects. Hydro-Quebec would like all these turbines up and running by the end of 2013, with agreements running from 15 to 25 years. At closing of bids, 25 companies had submitted 66 projects for close to 8000 megawatts of capacity.

We should recall the lessons learned from bad experiences with the mining industry. Mining companies built towns, exploited the ground and whatever was underneath it and, when the ore bodies were worked out, they shut down and dismantled the operation, leaving our governments with the job of cleaning up their mess.

Likewise, wind turbines are meant to operate for about 20 years: what will it cost to take them down, and who will pay? Will Hydro-Quebec or the government impose some kind of fee on wind power developments to take care of demolition at the end should the promoter fold? No clear answers as yet.

Meantime, 3C Inc. confirmed its partnership with La Métis Regional Country Municipality (RCM) to tender for a 30MW project valued at $65 million. Not very far from La Métis in Carleton-sur-Mer, Cartier Énergie Éolienne (a subsidiary of Innergex Funds) just received the okay to start building its wind power generation farm. Minister of Gaspésie-Îles-de-la-Madeleine region, Nathalie Normandeau, announced the government's approval on this project comprising 73 turbines, generating 1095 megawatts, worth about $170 million. Ten people will work on the farm when it's completed around the end of 2008. Hydro-Quebec is Cartier's only client.

Lately, the town of St-Donat in the Bas-St-Laurent region announced it will vigorously resist a 230kV power transmission line project between Baie-des-Sables and Rimouski. The town will ask BAPE (Bureau d'audiences publiques sur l'environnement)—roughly translated as the Environment Public Hearings Bureau—to conduct a public hearing on this issue.

Meantime, Laval (the second-largest city in Quebec) passed a motion to modify zoning plans to allow farmers to erect windmills on their premises, be they private or commercial, though limiting them to 12 metres in height. (30% of Laval's territory is agricultural.)

In short, wind power generation and turbines are undergoing turbulence in Quebec, and protests come from many sources—not just the left wing.

Technical presentations and lectures on the criminal code across Quebec

Benoît Crête and his skilled assistant, Nancy Généreux, are building a custom-designed/-made control panel for a piece of production equipment.

Maryline Rosan, Michel Watkins and Denyse Brodeur—three expert lawyers explain Law C-21 and answer participants' questions. A great team, they've presented this lecture dozens of times over the last two years.

Electro-Federation Canada (EFC) and AcpééeQ are involved in another joint venture—along with an integrator and his main supplier (STBC [Services Techniques Benoît Crête] and Omron)—to explain to both maintenance electricians and students the ins and outs of safety curtains and barriers.

The tour will visit 10 cities at the pace of one a month in the province. (The last event of the series is scheduled for Trois-Rivières on June 10 next year.) The half-day events conclude with a discussion with workers and supervisors that explains the risks of being charged with criminal negligence under Law C-21 (affecting the criminal liability of organizations) for accidents occurring in the workplace. The seminar and lecture are presented as Part II of an educational day, which also has a seminar on changes to the electrical code.

This tour is made possible by the involvement of EFC-Quebec Region. EFC acts as the official umbrella association representing the electrical industry at the Employers Health and Safety Council (Centre patronal de santé et sécurité du travail du Québec). This not-for-profit group helps organizations solve their health and safety issues; it will delegate one of the three lawyers shown at top right as speaker for each of the 10 events.

Why Law C-21 is something you should know

Law C-21 (Bill C-45) establishes criminal liability for organizations and individuals when they fail to take reasonable steps to prevent workplace accidents affecting workers or the general public. It does more than just create additional legal liability for directors, officers and corporate decision-makers; it extends legal liability to all persons directing work in the workplace. In the case of death, the maximum penalty for an individual convicted of criminal negligence is life imprisonment!

There are three important elements to Law C-21:

1. It elevates the stigma and penalty to that of a crime with a permanent criminal record.
2. It extends legal duties to a new level, to include foremen, lead hands—even co-workers.
3. It goes further than any OHS legislation in the past because it makes employers responsible for the public at/near the workplace, as well as all persons affected by the work.

Organizations should assess their current occupational health and safety programs, training budgets and commitment to workplace health and safety. Compliance demonstrates that you and your organization are taking "all reasonable steps" toward preventing bodily harm. EB

Further confusing what work is lienable

By Stephen Tatrallyay, LLB

Stephen Tatrallyay is a prominent Toronto construction lawyer and can be reached via e-mail at statrallyay@rogers.com or by calling (416) 482-5164. He is also a member of EB's Editorial Advisory Board.

Ontario Court of Appeal releases decision upholding Kennedy v Dana

Be careful! It would seem claims for lien are not available to suppliers of non-construction equipment to a "bricks and mortar" base building—even when its entire purpose is to contain such equipment and produce something with it.

Near the end of September, the Court of Appeal released its unanimous decision upholding the majority decision of Divisional Court in Kennedy Electric v Dana Canada Inc.[1]

This means that claims for lien are not available to suppliers of non-construction equipment to a "bricks and mortar" base building—even in circumstances where the entire purpose of construction of the base building was to contain such equipment and produce something with it.

In this case, Dana Canada Inc. owned land in St. Mary's, Ont., as part of its production facility for Ford vehicles located there. Dana decided to construct a building on the land in St. Mary's to house the assembly line for a new line of pickups. The evidence at trial was that there was not much interaction between the building designer and the designer of the assembly line, Rumble Automotive, to determine the configuration of both building and assembly line, but that it was always the intention of all concerned to use the building to contain the assembly line.

Rumble designed the line and hired Kennedy Electric to actually construct it. The work consisted of the erection and installation of more than 100 mezzanine platforms, each purpose-designed to hold one or more of the pieces of equipment necessary to the assembly line, covering about 100,000 sf of the floor of the building, weighing about half a million tonnes and standing, on average, 20-ft high.

The work was in two phases: first, a mock-up of the line had to be built in Rumble's facilities in Mississauga to ensure it actually worked, then the whole thing had to be dismantled by Kennedy, shipped to St. Mary's by truck and reassembled. It was "attached" to the building by thousands of mechanical and chemical bolts. To detach the equipment would result in the cutting of those bolts and inevitable damage to the floor.

Unfortunately, there was a falling out between Rumble and Kennedy which resulted in Kennedy allegedly not being paid several million dollars and, in turn, not paying some of the subtrades that worked for it. Kennedy and some subtrades liened the project and started actions to enforce their claims. The question of lienability was brought to trial before Justice Killeen sitting at London. In a decision rendered late in 2004, Killeen held that the work in question was not lienable.

I served as counsel for Kennedy at trial and admit to a bias in Kennedy's favour. Killeen conducted a very thorough review of the case law, referring to every case brought to his attention. He indicated that he was bound by the Supreme Court of Canada's 1963 decision in Ace Lumber v Clarkson Co. Ltd., to the effect that, because a Mechanic's Lien was created by statute, the legislation should be given a strict determination of what types of claims could be protected by it.

After recognizing that the entire case turned on the definition of "improvement", but without really considering the meaning of that word himself, the trial judge turned to the report of the original committee which drafted the act and, specifically, to their definition of "improvement":

> While the definition... is broad, the Committee has attempted to draft it in such a way that it will be clear that the lien created by the Act applies only in the case of the construction and building repair industries.

He also cited the Ontario Court of Appeal's 2001decision in Central Supply v Modern Tile, where the Court seems to have approved such an analysis.

The only prior Ontario appellate court decision he could find supporting that approach was from back in 1952, decided under an earlier act with a totally different definition of "improvement". Cases from other provinces, while generally supportive of his approach, were by no means unanimously so; indeed, the B.C. decisions seem to have recently begun to go the other way. The judge distinguished these on the basis of different wording in the definition of "improvement" in the B.C. Act (notwithstanding that it is actually more restrictive than Ontario's).

Killeen's expressed reason for rejecting the lien was that, while the machinery was to be bolted to the floor of the plant building—and lines for the layout painted on the floor—it was admitted that all of the base services were installed by the constructor of the base building, and that it was outside the scope of Kennedy's contract to even hook up to them. The trial judge was also impressed by evidence that Dana had, on occasion, disassembled similar systems in other plants, moved them elsewhere and reassembled them. (In this case, though, there was no evidence of any intention on Dana's part of doing this. Indeed, the contract between Dana and Ford specified that the equipment remain in that location to produce that line of trucks for at least eight years.)

The Prime Contract specified that no liens were to be tolerated on the project, and must be removed forthwith. Kennedy's contract was silent on the point, although it did provide for a 20% holdback until job completion. Although

Kennedy strongly emphasized the fact that the plant had been specifically purpose-built, and that it and the equipment must be treated as one integrated whole, the judge disagreed and found that—in its essence—there were two separate contracts. One was just a building and could have been put to any use. This was lienable. The other, which was not, was the supply and installation of equipment for commercial purposes which could have gone anywhere, given the proper specifications of the building it was to be put in.

Although his mandate did not require him to do so, the trial judge also made a broad statement to the effect that the installation of any equipment for commercial usage could never be lienable because the Construction Lien Act was exclusively intended to assist those in the "construction industry", even though the act does not expressly say so.

There was considerable concern about the decision, particularly in the electrical and mechanical sections of the construction industry. The implications are obvious—the old "chattels versus fixtures" debates are no longer relevant. The installation of commercial machinery is not lienable, and any contract between owners and contractors performing such work must be revised to protect payment rights and provide quick remedies.

On first appeal, a majority decision in Divisional Court upheld Justice Killeen's decision, albeit with a strong dissent by Madame Justice Chapnick.[2] The matter then proceeded, with leave, to the Court of Appeal. That court released its decision, rejecting the appeal, on September 27.

The court's basic reason for dismissing the appeal was that the trial judge made findings of fact supported by at least some of the evidence before him, and an appellate court should not interfere with such findings of fact (except when there is clear evidence that the trial judge did not understand the evidence or misinterpreted it).

On the question of portability of the assembly line, therefore, Justice Armstrong held that, "While a different judge may have come to another conclusion on the issue of portability, I am satisfied that it was open to the trial judge to reach the conclusion that he did". While it is nice to see the court approving this often-neglected principal of deference to the trial judge—which it does not always do—it is always available to them to change the decision if the judge has misapplied legal principles to those facts.

An incorrect statement or application of a legal issue can and should be reviewed by the appellate court without deference. I believe this is what Justice Chapnick was trying to do at the Divisional Court level. The Court of Appeal, however, decided that the judge was making findings of fact (which could, in theory, be supported by evidence before him) and applying the law based on those findings. Applying this approach, he had the right to be wrong as long as his findings were based on some evidence.

Contractors supplying these types of equipment or materials—and their lawyers—are advised to review and carefully consider the implications of the decision on their own businesses.

Notes

1. Kennedy Electric Ltd. and Cassidy Industrial Contractors Ltd. v Dana Canada Corp. 2007 ONCA 664 (2007) 61 CLR (3d) 1; decision of Ontario Court of Appeal, released Sept. 27 2007).
2. (2006) 50 CLR (3d) 283 (Ont. Div. Ct).

LETTERS

Transported to New York

I enjoyed reading the article about relighting the historic Custom House on page 40 in the October 2007 edition. It was so well written that I seemed transported to the site, even though I was never there before and have never seen any pictures.

Are there any 'before' and 'after' pictures available, please?

— Harald T.

Check out www.oldnycustomhouse.gov
— Ed.

Let's focus on the good!

I was just reading your letter from Brian B. complaining about the House of Horrors, and he's absolutely right (EB Sept 07, "Horrified by house of horrors", page 6). We all slow down to look at car accidents, and this is our version of that same scenario. Perhaps there should be a showcase feature to run alongside the House of Horrors spotlighting contractors that provide quality workmanship.

I am an electrical contractor [that mostly does] custom cottages. I have always felt that when terminating the electrical panel it is important to put a little pride into it and do the best that you can. When you visit a home and end up in the mechanical room, you're going to notice the panel—so if the rest of the house looks good, then so should the panel. I was once told that every trade reflects on one another. When a home shows well but the panel is a dog's breakfast, it brings down the quality of the overall project.

Also, the panel is about the only place a residential contractor can show his stuff; everything else is just devices. I've never been asked, "Hey, did you install those receptacles? Nice job". A neat electrical panel shows pride and craftsmanship. Time-wise I'm pretty sure it works out about the same [as a sloppy job] when you prepare and think about your approach to the job. Neat workmanship also also generates work because when someone sees a job well done, and they're in the market for an electrical contractor, you will be getting that call.

Thanks, and I'll look forward to next month's Electrical Business, as there are always interesting articles inside.

— James P.

A few extra minutes for your life: Daniel's decision

Dave Smith is president of Canada Training Group and has been providing consulting services to industry since 1980. This story and others can be found at www.canada-training-group.ca. Please feel free to use this information to support your own safety program.

By Dave Smith

I've known Daniel (not his real name) for several years; he had been a journeyman for about 25 years, and had his own one-man contracting business. Then he had an accident, and quite a few weeks passed before I saw him again. When I did, a body wrap was covering his torso.

It turns out he had been working on a 480V electrical panel with a local three-phase disconnect, which he turned Off before opening the panel and getting to work. When he put his screwdriver into the panel, an explosion occurred.

(This is common with older disconnects: one blade stayed in because the mechanism was broken. Sometimes you can actually feel this as you are operating the handle. Perhaps the person who last closed the disconnect felt or heard something strange but never thought to check it out further.)

Regardless, Daniel paid the price for this breakdown. When his screwdriver hit the live phase, he created a short circuit to ground that quickly built from line to ground, line to line to ground, and eventually all three phases to ground.

As with any arc flash accident, it was all over in a split second. All that was left of Daniel's shirt were the cuffs and the collar—everything else was burned right off his body. Luckily, his face was spared a direct blast of hot plasma as it blew out of the panel because it was positioned a little lower on the wall.

I visited Daniel regularly after the accident (he was in that body wrap for about six months) and asked him about the pain. Burn pains are terrible. Take the sensation you get when you burn your finger with a match, lighter or stove element, then magnify it a thousand times across your entire body. Daniel said the doctors were finally able to get his pain under control, but it was the nights that he found most difficult as he tried to find a comfortable position in which to sleep. He was in continual agony for months.

Eventually, I grilled Daniel about the accident; specifically, I wondered why he had not done a voltage check. He was clearly embarrassed when he admitted that his meter had been in his toolbox, and he couldn't be bothered to get it, so he reasoned that, well, if the disconnect is Off, then so should the power to the panel.

Daniel made a devastating assumption that cost him dearly (and we all know what happens when you "ass-u-me")—first the torturous pain, then the loss of income as a self-employed contractor. With no compensatory insurance to get him through this rough period, he was forced to return to work a lot sooner than he should have. Though still in pain, he was out there working and trying to put bread on the table. Normally a very calm guy, the constant pain and financial pressures made Daniel pretty short-tempered, and his family got the brunt of it. It was a difficult time for all of them.

This is the rational behind NFPA 70E, Rule 120.1(5), which requires a contact voltage measurement before starting work: simply too many accidents have occurred because people assumed an electrical circuit was deenergized when, in fact, it was not.

The difficulty with people is that we're always in a hurry; our meters "are way over there in the toolbox" or "out in the truck", and we make a bad judgement call. Forcing ourselves to perform a voltage check every single time is difficult; we'd rather take a short cut here and there. However, skipping a voltage reading is not a short cut you want to take. Neglecting to verify that a piece of equipment is truly deenergized risks both your life and your livelihood.

Don't be hasty: take a few extra minutes, get your meter and save your life. EB

Protecting your power

Specifying outdoor generator enclosures

By James Iverson

As businesses and industries add more and larger emergency standby generators to reduce the impact of power outages, deciding where to locate these gensets can be problematic. Stand-alone buildings or large mechanical rooms are not an option in many applications, particularly existing facilities or other sites with limited space or other installation obstacles. Outdoor generator enclosures are the answer in these situations, and as emergency standby generators have become more vital to the continuation of business so, too, have outdoor genset enclosures that are properly designed, ventilated, secured and located.

Once the decision has been made to install the genset out in an enclosure, the overall cost and ease of installation will depend on the physical location of all elements of the system: genset, fuel tanks and accessories. Several types of enclosures are available, including weather-protective, sound-attenuating and walk-in.

Weather-protective: While metal enclosures provide weather protection against the elements, they do not retain heat or hold temperatures above ambient in cold weather, or provide cooling beyond the ventilation and airflow offered by incorporated louvers or perforated panels. Sound attenuation is minimal and, due to their tight fit, access panels or doors are required for maintenance and inspections.

Sound-attenuating: These enclosures may be specified when noise reduction is needed to meet local ordinances. They are generally larger and more costly than strictly weather-protective enclosures due to the design features required to reduce noise.

Walk-in: This term encompasses a variety of enclosures that are custom-built to a specific application. They often include sound attenuation, as well as space for power switching and monitoring equipment, lighting, fuel tanks and other equipment. They can also accommodate insulating and heating capability. Walk-in enclosures may be treated as a building by local inspection officials.

Outdoor enclosure criteria

Virtually any genset size can be housed in an outdoor enclosure available from the generator supplier or a variety of third-party suppliers. When your facility is considering a new generator that will be housed in an outdoor enclosure, you should consider the criteria that follow.

Site selection

The location for your outdoor enclosure should be level, well-drained and secure from flooding, fire, icing and vandalism. For reasons of reliability, the genset should be located near the main electrical service but not so close that localized problems at the service entrance will interfere with it. For example, a fire at the utility service entrance would be less likely to affect a standby genset located some distance away. Control panels and connections should have ample clearance for easy access, and the fuel tank should be located so that refuelling is convenient. Also, keep the generator location away from building openings, combustible materials or building ventilation inlets.

In multiple-generator applications, be sure there is adequate spacing between generators. Orient the enclosures so that the heat from one generator is not drawn into others.

Sometimes, as a last resort, the only outdoor location for an enclosed genset may be the rooftop. Provided the roof is properly designed or modified to take the extra weight, this can often be a solution in urban areas. However, there are advantages and disadvantages. While this location may resolve space limitations, refuelling, load bank testing and maintenance may be more difficult.

All-weather protection

The amount of weather protection needed is often a matter of geography. In tropical climates, the principal weather challenges are sun, heat, rain, salt spray, wind storms, blowing sand and lightning. Within 60 miles of the ocean, aluminum enclosures resist corrosion from salt air. In more northern climates, ice storms, heavy snow and severe cold pose additional threats.

It is recommended that any outdoor genset enclosure have a corrosion-resistant finish (often aluminum or painted steel),

stainless steel hinges, corrosion-resistant handles and other hardware, and rain shields on cooling air intakes and exhaust. Cooling air intakes and exhaust may need motorized louvers that open when the genset is started and close automatically when it is off to protect against precipitation.

The outer surfaces of the enclosure can be primed and painted sheet metal—either steel or aluminum. The paint needs to be of a quality and thickness to retain gloss and resist minor impacts and corrosion due to salt spray, humidity and water (in accordance with appropriate ASTM standards).

In areas where ice and snow accumulate, it will be necessary to provide for regular snow/ice removal around doors, louvers and dampers. In cold climates, the enclosure may have to be fitted with an electric space heater in addition to having a coolant heater on the generator engine. Also, diesel fuel may need to be heated to prevent gelling.

In storm-prone areas, consider an enclosure with added structural strength to withstand high wind loading. Outdoor generator enclosures are available with enhanced strength that resists wind speeds of over 150 miles per hour. In earthquake-prone areas, a seismic-certified enclosure may be required. In flood-prone areas, install the generator and enclosure well above the highest expected water level (on an elevated platform or a rooftop, for example).

Controlling temperature

Gensets can maintain their rated power output so long as the ambient air temperature flowing into the enclosure does not exceed the cooling system ambient temperature rating and static restriction. When this air temperature is exceeded, the output of the generator will have to be reduced to prevent overheating.

Cooling requirements for the enclosed genset can also be affected by site selection. Whenever possible, locate the enclosure in an area where there is free air flow. Avoid locations such as covered parking ramps or other nearby walls or overhangs that may restrict cooling air flow or require complex routing of engine exhaust.

Select an enclosure with adequate flow-through ventilation that keeps temperatures in the optimum operating range. This will allow the generator set to operate at its nameplate rating. The best enclosures incorporate advanced radiator, fan and louver designs that provide optimal airflow through the enclosure to control engine and generator operating temperatures even in the most severe environments. Keep cooling air intakes and exhausts clear of obstacles.

Security

Vandalism is a common problem that can compromise a standby power system's reliability. Lockable access points to connections, switches and valves deter unauthorized persons from interfering with system operation. Access to the fuel tank and system controls should also be restricted.

Sound attenuation

Although gensets used for standby power do not run often, controlling the noise they produce can become a major concern when they are located near the property line or in a crowded urban environment. Most locales have ordinances that set limits on permissible sound levels at the property line. While exhaust silencers can greatly suppress exhaust noise, much of the noise from an enclosed genset comes from the cooling air fan. This fan noise is harder to control but can be greatly reduced by carefully designing the air intake and air exhaust plenums.

Sound attenuation depends on many factors, including the sound level produced by the generator engine, the design of the air intake/exhaust plenums, the type of exhaust silencer and local conditions. Work with your genset and enclosure supplier to determine the level of noise suppression needed to comply with local regulations. Most enclosure providers offer one or more levels of sound attenuation as options.

Additional issues regarding sound attenuation include:

- Critical sound-attenuation remedies will increase the overall footprint, complexity and cost of an installation.
- Sound-attenuating materials in the walls and ceiling of the enclosure trap not only sound, but heat.
- If sound attenuation is required, specify non-hygroscopic and non-flammable material to prevent moisture build-up inside the enclosure.
- Pay particular attention to noise generated at cooling air intake/exhaust plenums. The design of airflow through the enclosure is critical to minimizing this noise.

Fuel

For increased security and to reduce the footprint of your installation, many gensets can be ordered with an integrated high-capacity fuel tank. It protects fuel lines and filler connections within the enclosure for better security and provides a compact installation. Look for tanks that include dual-wall construction, fuel gauges and provisions for catching fuel leaks, ruptures and overflows. Be sure to allow sufficient clearance around the enclosure to allow fuel trucks to access the enclosure. Consult local authorities regarding fuel tank codes.

Maintenance

For walk-in enclosures, ensure there is sufficient room within for easy maintenance access to key genset components. Skin-tight enclosures should have large access doors and panels. Good interior and exterior lighting can make all maintenance and troubleshooting tasks easier.

Conclusions and recommendations

Specifying the best enclosure for a standby power system is an important task, because it can have an impact on both the short-term operation and long-term reliability of the system. Start with a thorough assessment of your power needs, installation location and environment, then work with your genset and enclosure supplier to design an installation that fits all your specifications. EB

Jim Iverson is a senior applications engineer for Cummins Power Generation, and holds degrees in Engineering Science and Electrical Engineering. His responsibilities include providing technical direction to the Commercial Marketing and Sales departments, participating in domestic industry codes and standards development, providing sales and service training, developing technical input for published literature and software, publishing technical papers on relevant industry topics, and providing application engineering support to customers.

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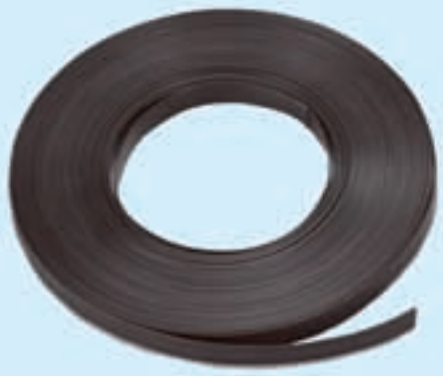

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In September, GE Canada and Bordeaux Developments announced the signing of the first GE ecomagination Homebuilder program in Canada. The proposed 1750+ acre Harmony project is located in the Municipal District of Rocky View, west of the City of Calgary, Alberta. The project will incorporate sustainable development practices including leading edge environmental initiatives designed to promote healthy life styles and smart land use. It is expected that 3500 homes will be built, as well as commercial and office buildings, a healthcare facility, and extensive open space/recreational facilities. Bradley Smith, Manager of Corporate Initiatives, worked across GE businesses to bring the exciting collaboration with Bordeaux together. The project provides opportunities for infrastructure projects and home/office based applications, including water management and reuse, systems design, lighting, appliances, GE Healthcare and Enterprise Solutions.

In the community

GE Canada is dedicated to improving the communities where employees work and live. GE has a long history of volunteerism across the country. Employees and retirees volunteer their time and talent to many special causes. GE's volunteers actively contribute to community building through fundraising, mentoring, coaching, working with children, improving the environment and lending professional expertise. Our community investments support the advancement of science and technology for young people, health research, education and the environment. GE Canada values our important relationships with organizations like Junior Achievement, Habitat for Humanity and the United Way.

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imagination at work

INFO NO. 23

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Thomas & Betts Canada Ltd

A century of progress and innovation

In 2007, it is difficult to imagine a world without electricity. From the machinery in industrial plants to the systems in our cars, appliances, homes and businesses, electricity is all around us simplifying our daily lives and powering our local and global economies.

Where there's electricity, there's Thomas & Betts

In 1898, when the Thomas & Betts Co. was founded, electricity was in its infancy but already sweeping across North America and the world, leaving in its wake countless new inventions that would change society in a way that no other technology has done to date.

The evolution of Thomas & Betts as a company parallels the technological advances made possible by harnessing the power of electricity. In fact, many of Thomas & Betts' early products such as Sta-Kon® solderless lugs and the Color-Keyed® colour-coded system of connectors, tools and dies were ''industry firsts'', developed in direct response to the expanding needs of the electrical industry.

Building on a legacy of technological excellence

In 2007, Sta-Kon® and Color-Keyed® products are still a mainstay of T&B's product offering to the industrial market. Continuous investment in new product development and maintaining the technical excellence of existing products such as these are central to the way Thomas & Betts runs its business.

Strategic investments in research and development and new manufacturing technologies as well as the latest in quality and safety programs, enable us to continue to develop, refine and enhance the diversity and quality of our products. It also provides us with the flexibility to respond to special requests for customized products in a timely and cost-efficient manner.

Canadian design and manufacturing

To ensure our products continue to meet the needs of electrical contractors, specifiers and maintenance personnel across Canada, Thomas & Betts conducts regular on-site visits to gather input from the people who specify and install our products.

Ideas and input gathered from Canadian engineers and installers have resulted in high-performance products that also simplify installation and maintenance. The StarTeck® line of teck fittings, for example, was developed in direct consultation with engineers working in Canada's petroleum industry to respond to uniquely Canadian requirements for safe cable terminations in hazardous locations.

Other products manufactured in Canada, for Canadian and global distribution, include Iberville® steel outlet boxes, Iberville® roughing-in products and cable fittings Microlectric® meter sockets and pole line hardware, Marrette® twist-on wire connectors, T&B Cable Tray Systems, Nutek® plastic boxes and T&B Conduit Fittings.

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A market-focused sales force – one of the largest in the Canadian electrical industry – backed up by a knowledgeable inside sales team, work in each of our six sales regions to serve the needs of end-users and our extensive network of stocking electrical distributors. Additional support is provided by a centrally-located, market-dedicated customer service group.

Our on-line service tool, T&B Access, puts the latest in information technology at distributors' fingertips, providing them with instant access to up-to-date product and ordering information, and the ability to carry out routine transactions 24/7 via www.tnb-canada.com.

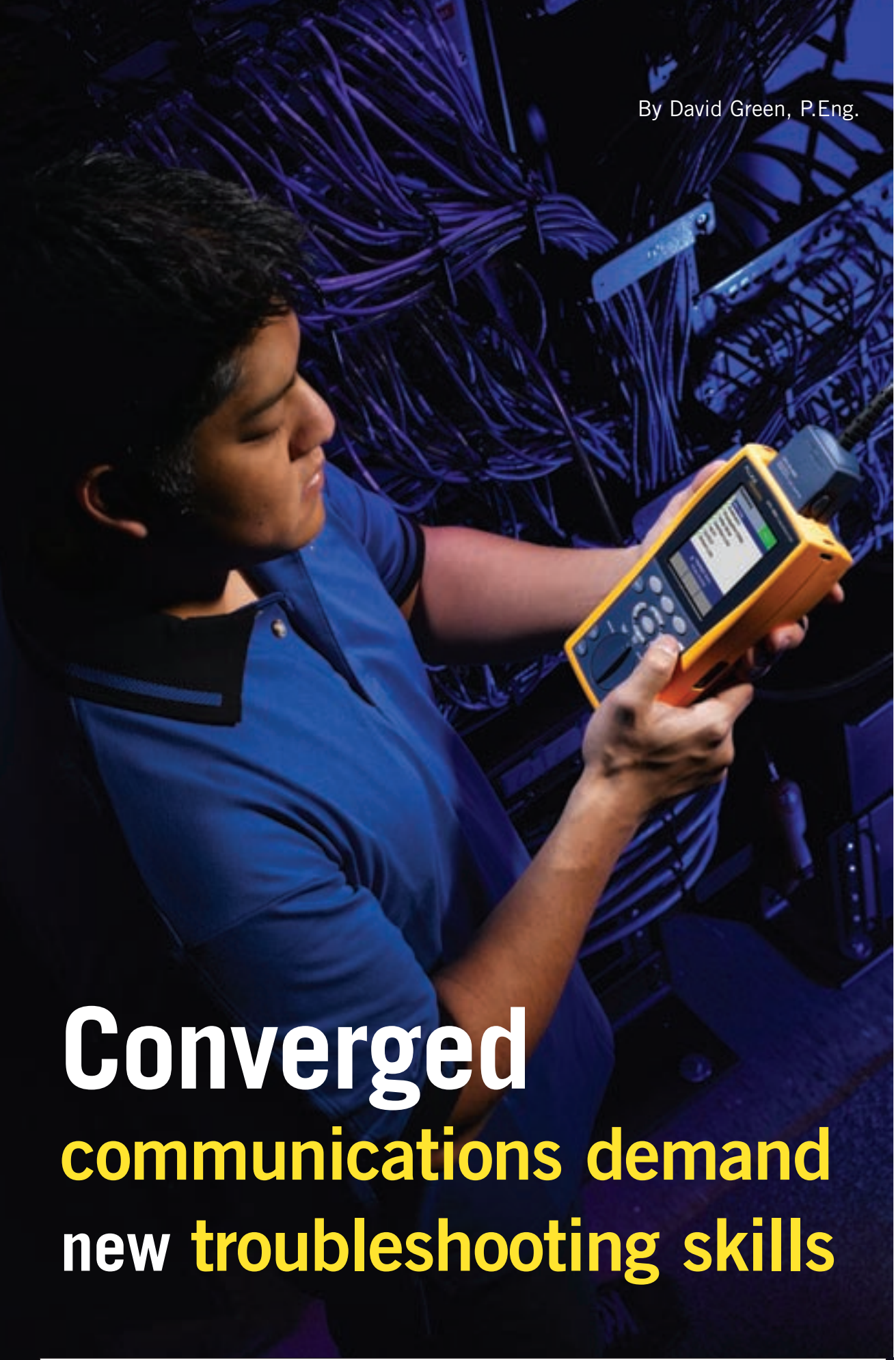
Through investment in data synchronization and other electronic commerce technologies, Thomas & Betts partners with electrical distributors to increase transaction efficiency. Our objective is to make every ordering experience with Thomas & Betts both pleasant and profitable for both distributors and end-users.

Delivering the goods

All Canadian orders are shipped from our WMS driven, Master Distribution Centre in Bromont, Quebec. Incorporating the latest in material handling, computer and order processing technology, the Centre has the logistical resources to meet all supply chain requirements as well as providing customized value-added services, rapidly and efficiently on a daily basis.

Today, as in 1928, Thomas & Betts remains committed to providing customers with products and services that consistently exceed performance and safety expectations. Through continuous improvement and innovation, we're ready to meet the challenges of tomorrow and the next century.

INFO NO. 24



Converged communications demand new troubleshooting skills

By David Green, P.Eng.

Photo © Fluke Networks

With the escalating move toward voice, data and video (VDV) convergence, today's cabling installations are becoming increasingly sophisticated. These newer, high-performance Cat 5e and Cat 6 cabling systems must support faster data communication rates and more precise timing of the delivery of VDV information. As a result, professionals must know how to test installations to the more complex performance specifications that have been developed to address higher bandwidth requirements.

Testing and certification for newer cabling systems entails new test parameter and link definitions, more data points, higher bandwidth, a higher level of performance and new connector types—as well as patch cord requirements. After all, proper certification is the guarantee that the installer left the job in good working order, and that the installation will perform at the necessary levels to support a customer-approved SLA (service level agreement).

What follows is a brief overview of what you need to know about certifying cabling for today's VDV triple-play installations. There are, in fact, three key areas that you need to consider in the certification process:

- The link model: choosing the proper test setup and eliminating a common source of measurement error.
- The measurements: what is tested and reported during certification.
- The diagnostics: when errors are found, how they can be fixed as rapidly as possible.

Link models

The term 'link model' refers to the configuration of the cabling link under test and the manner in which the test equipment is connected to it. It is important to ensure you are using the correct link model standard with the appropriate tester interface hardware.

The majority of all certification tests in the field should use the Permanent Link model, which consists of the cable and the permanent connectors in the wall outlet or patch panel. The connection from the test instrument to the Permanent Link is made via a *Permanent Link Adapter* (Figure 1).

Keep in mind that the *channel link* model defines the performance of the completed end-to-end link as it is used by the operating network. Therefore, the patch cords that are used to connect the PC or network device must remain in the link and plugged into the channel adapter of the test instrument.

(This is why channel measurements are typically done when restoring service, or for verifying cabling for application support. It is uncommon to perform channel tests during initial installation, since the patch cords are rarely available at that time. See Figure 2.)

From a practical standpoint, installers need more sophisticated field testers, because they must to be able to measure the performance of the link without any of the effects of the test cords with which they are connected to the link-under-test. (The reference point for the measurements is not at the test instrument but at the far end of the test cord.)

If the effect of the adapter is not totally transparent, a good link can produce a failing test result. The probability of this happening increases with the performance requirements. In other words, Cat 6 is more likely to produce these false Fail results. So, when performing Permanent Link tests for Cat 6/Class E links, it is important to take special care to ensure you are using adapters that are appropriate for the cabling under test.

Certification measurements

Link certification requires a number of complex measurements, which change in degree of precision depending on the category of the installed link. For Cat 5e and Cat 6 links, a certification tool needs to measure or calculate:

- Wire map
- Propagation delay (delay skew and link length)
- Insertion loss
- NEXT (Near-End Crosstalk)
- Power sum NEXT
- ELFEXT (Equal Level Far-End Crosstalk)
- Power sum ELFEXT
- Return loss

The accuracy level of the certification tool determines its ability to make these measurements at an appropriate level for the type of link. For Cat 5e installations, Level IIe defines the minimum required accuracy. For Cat 6, a certification tool needs to meet Level III accuracy. Level IV defines a higher level of accuracy over a wider frequency range to certify the ISO Class F (Cat 7) links.

The certification tool must perform the measurements of all required test parameters over the prescribed frequency range for the category of cabling and with the number of frequency points defined in the standards. The test results can be inspected on the tester or they can be stored in full detail to be inspected ▶

Figure 1

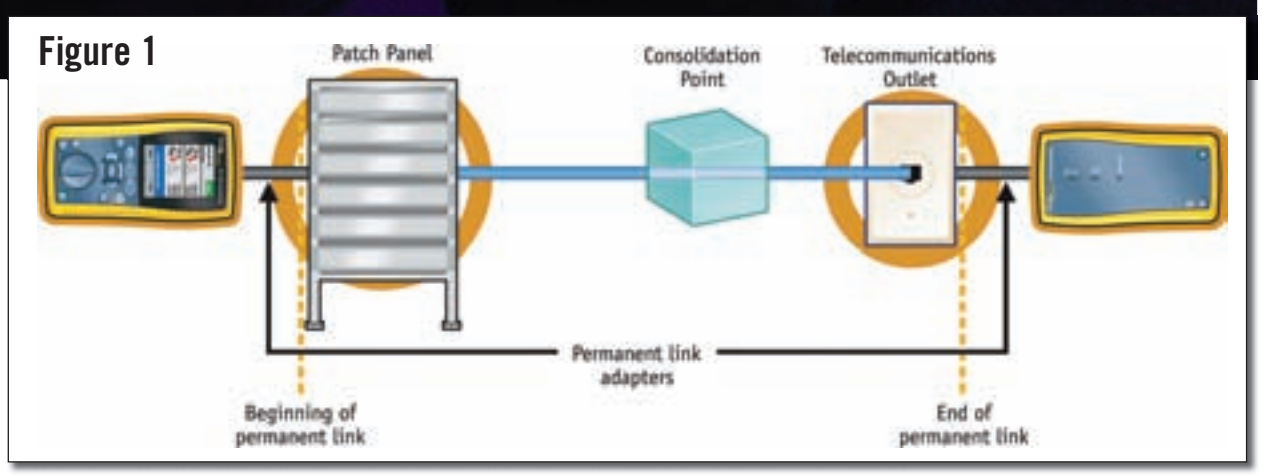
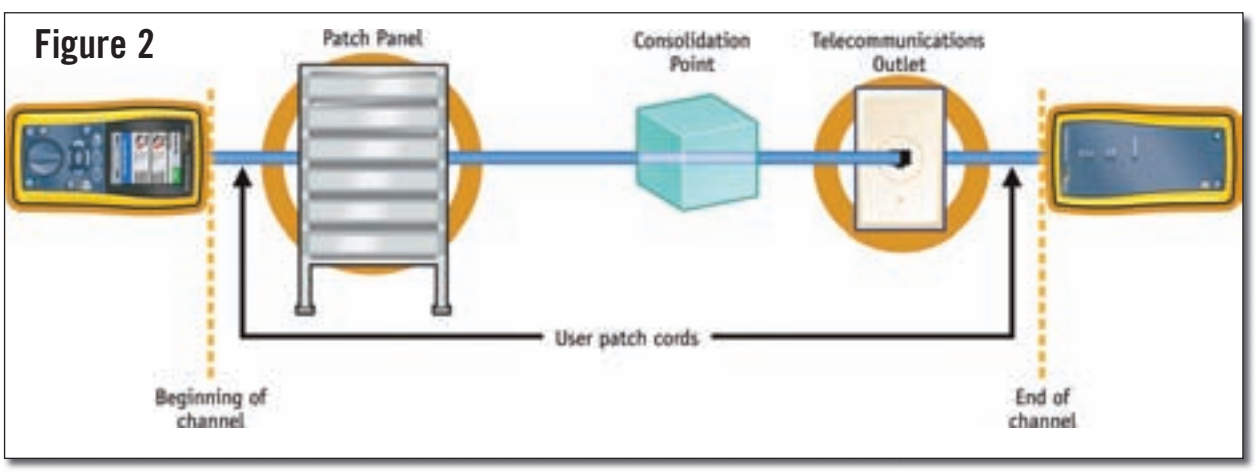


Figure 2



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InterNational Electrical Testing Association (NETA)
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Accubid User Conference
April 24-26, 2008
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Annual Electrical Industry Conference
Ontario Electrical League (OEL)
April 30-May 3, 2008
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Industry Conference
Electrical Contractors Association of Ontario (ECAO)
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Fire Safety Research for Better Building Design
NRC-IRC (National Research Council of Canada, Institute for Research in Construction)
January 15, 2008, Fredericton (English with simultaneous translation)
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later on a computer. (Figures 3 and 4 show detailed results from the NEXT tests across all four pairs, and the values-by-frequency for a single pair.)

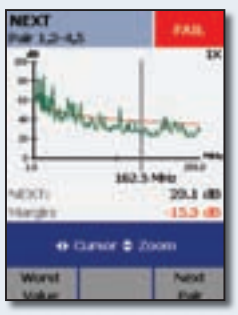

Figure 3

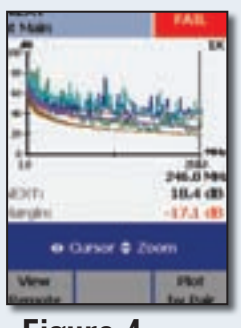

Figure 4

Advanced troubleshooting diagnostics

Knowing that a test failed is only the first step. Installers must also know how to repair the link so it will perform as intended. Where performance issues do occur, they tend to fall into two distinct categories: connection and/or transmission performance problems. Having expert diagnostics tools on-hand gives you a more informed starting point from which to begin the repair process—a far faster and more productive approach than the usual trial-and-error.

Many tools can provide information regarding the connection problems, such as an open, a break, a short, etc. The user should select a tester that can properly locate a break or a short in the cabling, as well as identify problems caused by improper wire pairing. In addition, certification testers should include advanced troubleshooting diagnostics that identify and locate transmission defects.

With the growing demand for converged communications, structured cabling represents a growing opportunity for the professional installer. Advanced testing and certification skills are essential to assure appropriate performance levels and guarantee the infrastructure will support bandwidth requirements. With the right combination of tools and procedures, you can make the testing phase fast, effective and, ultimately, more profitable. EB

David Green, P.Eng., is director of marketing for Fluke Networks Canada, and has been involved in technical support, sales and marketing of various technologies for communications, automation, testing and troubleshooting of industrial and commercial systems for over 30 years. He is also the education program manager for Fluke, working with educational institutions globally to develop industry-education partnerships.

Building permits slip, but construction still strong

StatsCan says the value of building permits slipped slightly in September—although they were still well above $6 billion, as gains in the residential sector were more than offset by declines in non-residential intentions.

Municipalities issued building permits worth $6.2 billion in September, down 1.7% from $6.3 billion in August. Intentions peaked at $6.9 billion in May and June. This strength during recent months indicates that construction sites should remain busy in the coming months.

Non-residential permits declined 8.6% to $2.2 billion, the lowest level over the last five months. The non-residential level was almost $1 billion below its peak in May 2007. The industrial and institutional components experienced double-digit decreases, while the commercial component remained virtually unchanged.

In contrast, intentions in the residential sector climbed 2.6% to $4 billion. This ranked as the second-highest monthly value since December 2005, thanks to a fourth gain in five months for the single-family component.

The total value of building permits reached $18.7 billion between July and September, down 4.1% from the second quarter of 2007. This was the second-highest quarterly level on record for the total value.

Unfortunately, the quarterly growth in residential value of 2.1% was not enough to offset a 13% loss in non-residential intentions.

Housing: Single-family reaches record high

Strength in employment, growth in disposable income, tight apartment vacancy rates in certain centres, and attractive financing options continued to stimulate the demand for housing.

However, the deterioration of housing affordability due to the rapid growth in prices for new housing—particularly in Western Canada—and the recent increases in mortgage rates could erode demand.

Municipalities approved single-family permits valued at a record-high $2.7 billion, a 9.4% increase over August. The number of single-family units approved rose 4.4% to 10,454, the highest level since January 2006.

The value of multi-family permits fell 9% to $1.3 billion. The number of multi-family units authorized declined 12.7% to 9041.

Provincially, the value of housing permits increased significantly in Ontario (+27.2% to $1.6 billion). This gain originated from both single and multiple residential units, and was sufficient to compensate for the declines in other provinces.

The largest declines (in dollars) occurred in Quebec (-9.6%) and British Columbia (-9.8%), due to drops in multi-family permits. Residential permits incurred double-digit declines in each of the four Atlantic Provinces because of severe drops in multi-family permits.

In the third quarter this year, single-family intentions were up 6.3% from the second quarter to $7.5 billion, more than offsetting a 4.6% decline in multi-family intentions to $4.3 billion.

Q3 residential permit values rose in seven provinces. Increases in Quebec and Ontario were only partly offset by drops in Alberta and British Columbia, and generated a 2.1% increase at the Canada level.

Non-residential sector: Western Canada pulls down the numbers

Significant declines in the three westernmost provinces were behind the 8.6% drop in non-residential permits in September.

In the commercial component, municipalities issued $1.3-billion worth of permits in September, down a slight 0.4% from August. Commercial intentions peaked in May and June 2007, reaching $2.1 billion and $1.7 billion, respectively.

In September, a gain in office buildings permits was largely offset by decreases in projects in the warehouse and retail trade categories.

In the industrial component, the value of permits plunged 22.5% in September to its lowest level since April 2007. Lower construction intentions for manufacturing buildings were behind the retreat. The decline in industrial permits was spread across the country, as Quebec and Manitoba were the only provinces to show a gain.

The value of institutional permits also hit its lowest level in five months, with a 15.9% drop to $517 million. This was fuelled by a lower value of permits for medical buildings. The decline in institutional permits in September came largely from Ontario and British Columbia.

Provincially, the largest decline (in dollars) occurred in British Columbia, where non-residential construction intentions retreated 38.7% to their lowest level since November 2005. All three components experienced reductions in the province.

In Alberta, non-residential permits were at their lowest level in the last five months in the wake of a 10.1% decrease in September. In Saskatchewan, a 48% drop in September followed a strong August. In both provinces, the overall decline was fuelled by retreats in the industrial and commercial components. Quebec, New Brunswick and Nova Scotia also reported declines.

In contrast, gains were recorded in Ontario, Manitoba, and Newfoundland & Labrador. In Ontario, intentions for non-residential buildings surpassed the $1-billion mark in September for only the third time since 1989, thanks to projects for office buildings.

Despite the September decline, several factors are still having a positive impact on the non-residential sector. Low office vacancy rates, high corporate profits, increasing demand for health and nursing facilities, and the vigorous retail sector are all factors helping to stimulate the demand for non-residential space.

The total value of commercial permits declined 23.8% in the third quarter to $3.9 billion, following a record level in the previous quarter. The value of institutional permits rose 2.5% to their highest value ($1.7 billion) since the third quarter of 2005. Industrial permits increased 11.4%.

Metropolitan areas: T.O. leads the pack

Since the beginning of 2007, 26 out of the 34 census metropolitan areas posted increases in the total value of building permits between January and September compared with the same period in 2006.

The largest gain (in dollars) came from Toronto, with its very high construction intentions for non-residential buildings, and a strong gain in the single-family component. With still a full quarter to be accounted for, the value of non-residential permits was already above the annual totals for 2005 and 2006 in Toronto.

Toronto was followed by Calgary and Vancouver. In Calgary, the strong gain came in large part from the booming commercial sector, especially the office buildings category. In Vancouver, the strong demand in the housing sector was mainly behind the gain.

NEW SECTION

Designing an effective training program for your associates

By Joe Hajek

"Is training making a difference to our bottom line?"

This question is increasingly being asked of HR and training departments across many companies. And it's difficult to answer when the company's approach to training employees focuses on *responding to events* as they occur, such as adding a new product line or new business process, or discovering missing skills necessary for a job. Too often, the results from this approach measure mastery of the topic rather than impact on the bottom line.

The question becomes easier to answer when, instead, training is viewed *strategically*: "What skills and knowledge do employees need to accomplish their jobs, and how does their performance drive overall company performance?" An effective way to answer this question is with a competency-based learning program. It defines the competence requirements for job performance, the training that can develop that competence, and ties in with organizational performance.

According to David Dubois' "Competency-Based Performance Improvement: A Strategy for Organizational Change", a competency is a skill, trait, behaviour, attitude or body of knowledge required to perform a job. For someone in sales, competencies might include:

- being able to accurately fill out a sales order;
- being able to *listen* by focusing on a customer's voice, asking questions and confirming his request; and,
- being knowledgeable about products carried.

These may be satisfactory for job performance. Exemplary performance competencies are important as well. Showing a contractor how a new tool can save time and money can be more valuable than simply showing the features of the tool.

The more specifically defined the competency, the easier it is to develop training for it, and the more effective the learning will be. For example, "Excellent customer service and communication skills" as a competency is simply too broad, too general. It is made up of many behaviours, attitudes and traits. Targeting training to specific behaviours, attitudes and traits enables tangible changes in performance that will lead to improved customer service and communication.

To determine how important these competencies are to a company's overall success requires a look at business goals. The first step in developing a competency-based learning program is to understand the company's strategic business goals and the initiatives for achieving them. From that, the impact of training on these goals can be determined.

Business goals define competencies

Two important goals for electrical distributors are profitable growth and providing a positive experience for customers. Initiatives to achieve these goals might include providing pricing and service valued by customers, managing profitability in sales, order processing efficiency and managing inventory levels effectively—all of which require contributions from all parts of the company. Training can have an impact on many of the competencies required for these contributions, so it is important to include them in the training plan.

All companies have three great resources for understanding the skills, behaviours and attitudes that are necessary to produce job outputs at desired performance levels: 1) employees, 2) job descriptions and, 3) performance evaluation criteria.

- Employees know how jobs are truly performed.
- Job descriptions contain responsibilities (outputs) and qualifications (prerequisite competencies).
- Performance criteria provide the measurement of performance.

Input from these three sources provides the necessary requirements for desired competencies. For HR and training staff, it is essential to involve managers and executives in competency definition. They can best articulate company goals and how employees contribute. It is also an excellent way to show them the value of training their direct reports, linking job performance with organizational performance.

Competencies should integrate across different job roles. Vertical integration supports career planning and leadership succession, providing an intentional plan for employee growth into more senior roles in the organization. Horizontal integration provides for consistent mastery of competencies or knowledge across multiple roles at the same level in the organization, such as key company values or core leadership skills.

Foremost in determining specific training activities is to consider delivery methods that effectively produce the learning outcomes required to develop the desired competency. Training adults is most effective when it is interactive. Tasks and behaviours relevant to jobs can be practised before employees try it on the job. Other factors to consider in developing training offerings are:

- Delivery methods that incorporate multiple learning styles.
- Space and resources that are sufficient to reach employees who may be scattered among several branch locations.
- Core company values reflected in the subject matter.
- Company culture that is supportive of employees practising what they have learned on the job.

Cost constraints are always present, so it is important to prioritize the defined competencies to maximize the investment in training. Those competencies that are more critical to business success, or that impact a broad audience, are likely to receive a larger investment. Specific training often overlaps multiple competencies, which helps maximize the training investment.

The result of this effort becomes a list of training activities that map out specific competencies. The curriculum/competency map shows employees what is necessary to perform successfully in their jobs and how to develop their skills for improved performance, career advancement and transition. For managers, it can show where training can impact organizational performance, making it easier to plan for employee training and address individual performance issues.

Continued evaluation of the training program is essential to ensure that learning outcomes provide the desired competencies, and development leads to improved employee performance. Ongoing review of the competency definitions is also necessary so the organization can adapt to changing business climates, which can change business goals. New roles may be added or existing roles redefined, so competencies will change.

Developing a competency-based learning program is a big effort, but the payoff is even bigger. It is an effective way to make sure employee training is focused where it should be, moving the company toward its goals and making a positive difference to the bottom line. EB

Joe Hajek is an instructional designer with the National Association of Electrical Distributors (NAED), the association for the $70+ billion electrical distribution channel. Joe fashioned this article after a presentation he delivered at NAED's HR & Training Conference in October.

Need some help getting started?

Electrical distributors can turn to the National Association of Electrical Distributors (NAED) for help. With the help of industry professionals, NAED's Education and Research Foundation has created—and is validating—draft competencies for several distributor job roles that can serve as a guide for companies designing their own training programs. Publication of these drafts is planned for the fall of 2008.

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INFO NO. 27

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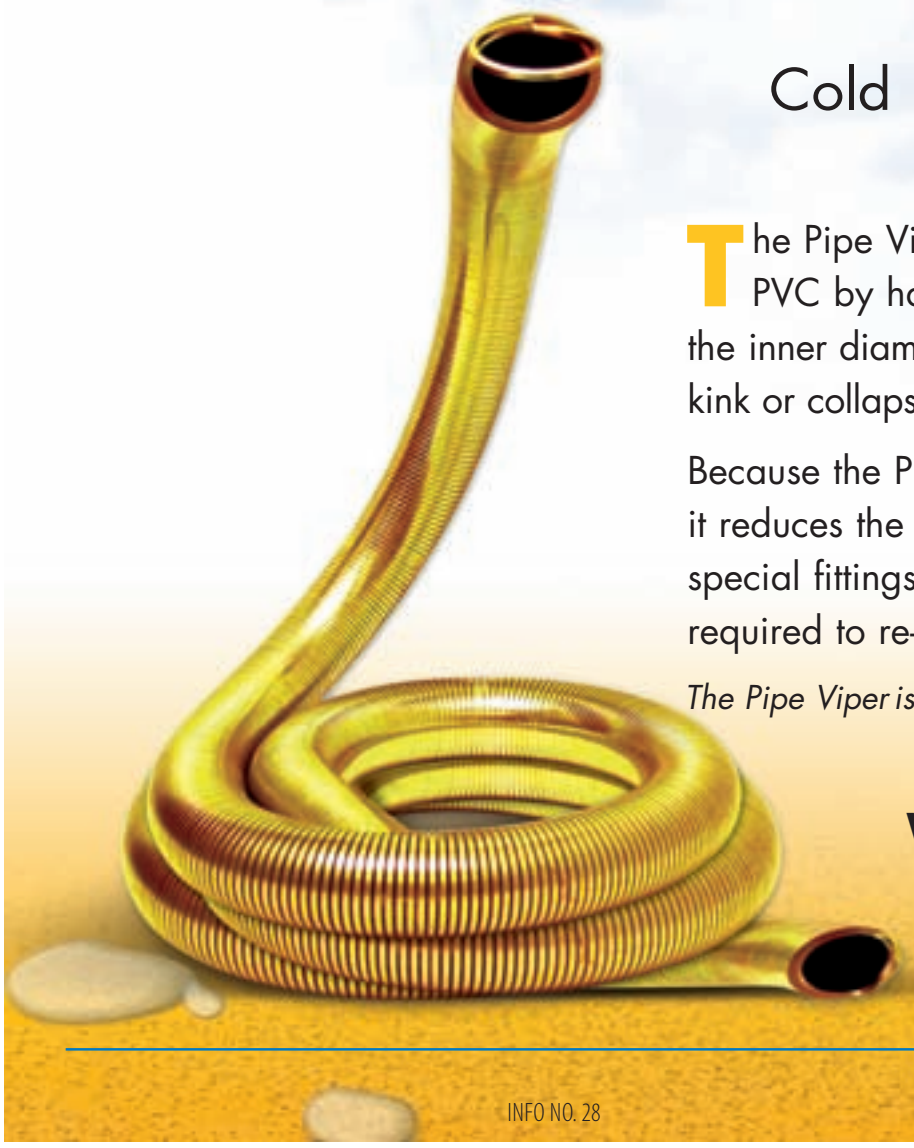

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INFO NO. 28

In addition to dual power-sliding doors, the 2008 Dodge Grand Caravan Cargo Vans feature abundant upfitter and storage capability with Stow 'n Go body and tubs. Photo © Chrysler LLC.

Among the 2008 Dodge Grand Caravan Cargo Vans' standard features are no intermediate or rear seats, industrial cargo floor and front rubber floor covering, as well as an integrated power distribution module. Photo © Chrysler LLC.

Comfort and convenience features in the 2008 Dodge Grand Caravan Cargo Vans include dual glove boxes and multiple storage bins and cup holders. Photo © Chrysler LLC.

2008 Dodge Grand Caravan Cargo Van

The 2008 Dodge Grand Caravan cargo van provides business customers space and durability to handle demanding commercial jobs. Designed with utility and visibility for commercial use in mind, the cargo van is a "garageable" solution that boasts a spacious interior along with a commercial suspension for heavier cargo.

In addition to dual power-sliding doors, the 2008 cargo vans feature abundant upfitter and storage capability with Stow 'n Go body and tubs. Comfort and convenience features include dual glove boxes and multiple storage bins and cup holders. It also offers a variety of glass and/or panel configurations.

Standard features include a 3.3L V6 with four-speed automatic transmission delivering 170-hp at 5200 rpm and 205 lb-ft of torque at 4000 rpm, a commercial-tuned front and rear suspension, Electronic Stability Program (ESP), four-wheel disc brakes with ABS, 225/65 R16 tires with steel wheels and a 20-gal fuel tank.

Additional standard features include power front windows and locks, remote keyless entry, front and rear power outlets, no intermediate or rear seats, industrial cargo floor and front rubber floor covering, CAN-based electrical system and integrated power distribution module, sunscreen glass, and side-curtain air bags with rollover protection.

Available options include Flex-Fuel (E85) capability, interior delete group (deletes rear quarter trim, C- and D- pillar trim and rear floor silencers), sidecurtain air bags delete and a 160A electrical alternator.

The 2008 Dodge Grand Caravan cargo van promises resilience and durability, providing 144.4 cf of cargo capacity, maximum Gross Vehicle Weight Rating (GVWR) of 6050 lb, Gross Combined Weight Rating (GCWR) of 7000 lb, payload capacity of 1500 lb and towing capacity of 3800 lb. Hydraulic power-assist rack-and-pinion steering, heavy-duty ride suspension, front anti-roll bar, and rear leaf suspension/springs combine to provide enhanced handling and driver comfort.

Designed for commercial use with both short- and long-wheelbase versions, Dodge Grand Caravan cargo vans are a suitable transport option for small business and commercial needs. Offering a spacious yet compact interior, its commercial suspension allows for carrying heavier cargo without sacrificing ride quality. Dual-sliding doors and rear-quarter window openings offer a variety of glass and/or panel configurations for the balance of utility and visibility that's right for you.

2008 Chevy Express... cargo van and people hauler

Powerful and versatile, the Chevrolet Express is not just a passenger hauler able to accommodate up to 15 passengers, but also a reliable and durable commercial cargo van. For 2008, Express delivers a higher level of safety, a freshened interior that includes a new driver information centre, and the dependable performance of small-block V8 engines.

Among the Chevrolet Express' safety features is the inclusion of a standard tire pressure monitoring system, as well as new flat and convex exterior mirrors that offer a wider field of vision. Standard on passenger (but available for cargo) are head curtain side air bags, providing a higher level of protection in the event of a side impact or a vehicle rollover. Other safety features include four-wheel anti-lock disc brake system with Hydroboost, dynamic rear proportioning, and driver and front-passenger air bags.

Stable handling, precise steering, good ride motion control and balance—as well as a quiet, isolated driving experience—are hallmarks of the Express. A three-piece frame features fully boxed sections for strength and rigidity, while extended and tapered front frame rails are used for improved crashworthiness. Also, additional tubular frame cross members are used to increase torsional stiffness.

Express is available in regular (135-in.) and extended (155-in.) wheelbase lengths, and offers seating for two (for cargo vans). The 1500 Series vans include light-duty models rated at 7200 lb GVW (Gross Vehicle Weight), while the 2500 Series includes heavy-duty models rated at 8600 lb GVW. The heavy-duty 3500 Series includes full-bodied cargo vans rated at 9600 lb GVW, with the commercial chassis at GVWs ratings of 9900 lb to 14,050 lb).

A three-piece frame features fully boxed sections for strength and rigidity in the Chevy Express, while extended and tapered front frame rails are used for improved crashworthiness. Additional tubular frame cross members are used to increase torsional stiffness. Photo © GM Corp.

The Express' interior boasts an extensively freshened look for 2008, with enhancements that include new steering wheel, HVAC dials, radio, window switches and materials for cloth seats, as well as a new instrument cluster. Housed within Express' new instrument cluster is an expanded Driver Information Centre that provides you with a wealth of vehicle information, including: instructions to replace the fuel filter,

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INFO NO. 30

As one of its engine options, the Chevy Express offers the Duramax 6.6L turbo-diesel V8 that delivers 250 hp and 460 lb-ft of torque. It is teamed with the Hydra-Matic 4L85 electronically controlled four-speed automatic transmission. Photo © GM Corp.

clean the exhaust filter and service the A/C system; warnings that the transmission is hot, traction control has been disengaged, the fuel level is low and a vehicle theft has been attempted; and reminders that a turn signal has been left on, the gas cap has not been properly tightened and that the vehicle's top speed is limited. The warnings, instructions and reminders can be viewed in English and French.

Customers are offered a choice of five gasoline engines, including four small-block V8 engines. A 195-hp Vortec 4.3L V6 with multi-port fuel injection is the base engine for light-duty Express Cargo. A central fuel injector delivers a separate flow of fuel to six individual hybrid injectors for better performance and improved emissions. Designed for quiet operation, these engines include a friction-reducing polymer coating on piston skirts, full floating piston pins, timing chain tensioner and a quieter alternator.

The small-block V8 engines in the line-up include the Vortec 4.8L V8, which cranks out 233 hp or 246 hp (depending on its weight class) and is used for heavy-duty applications in the 2500 Series cargo vans. Meantime, the Vortec 5.3L V8 delivers 301 hp and 325 lb-ft of torque, while the Vortec 5.3L is the standard engine in H1500 Cargo models. All 5.3L engines available are E85-compatible.

Express also offers the Duramax 6.6L turbo-diesel V8 that delivers 250 hp and 460 lb-ft of torque. It is teamed with the Hydra-Matic 4L85 electronically controlled four-speed automatic transmission, and is available on G2500 and G3500 Express Cargo Van models. A fuel-operated heater (FOH) is standard for vans equipped with the Duramax 6.6L to quickly provide heat to the vehicle interior in cold weather. Features such as electronic throttle control, fast-heating glow plugs and easy-service items enhance the driving and ownership experience.

The F-150 Series offers numerous body configurations, including three cab choices, three box lengths, two box styles and five unique series: the entry-level F-150 XL, F-150 STX, F-150 XLT, F-150 FX4 and luxury F-150 Lariat (to which the King Ranch version adds even more luxury). Photo © 2007 Ford Motor Co.

2008 Ford F-150 pickup

With a maximum tow rating of 11,000 lb (when properly equipped) and maximum payload capacity of 3050 lb, the Ford F-150 pickup boasts it is the most capable full-size pickup in its class. The F-150 Series offers numerous body configurations, including three cab choices, three box lengths, two box styles and five unique series: the entry-level F-150 XL, F-150 STX, F-150 XLT, F-150 FX4 and luxury F-150 Lariat (to which the King Ranch version adds even more luxury). All cabs feature four doors for easy access.

The F-150 includes the factory-installed Cargo Management System, a feature available on any truck with the 6.5-ft Styleside box. It provides a simple, easy-to-use solution for secure storage of all types of cargo. The basic system comes with two side rails, a pair of bins, a pair of crossbars and header bar. Extra bins and crossbars are easily added when extra capability and flexibility is needed.

Strong extruded aluminum double channel rails allow multiple accessories to be installed. Rails have cleat positions every 90 mm, and easily adjustable, cast-aluminum cleats are designed to hold over 600 lb. Extruded aluminum crossbars hold up to 100 lb and feature T-Slots on all four sides designed for non-traditional attachments. Side-mounted, blow-moulded plastic tool bins can hold up to 60 lb and feature double-wall construction. The pushbutton lock on the bins automatically keys itself to the first ignition key that is turned in the lock, enabling you to use one key for all bins.

A rearview camera system is mounted in the tailgate handle bezel and is activated when the vehicle is shifted into reverse, giving you a clear view behind. The video image is displayed in the self-dimming rearview mirror—a natural place for you to look while reversing. A tire pressure monitoring system is also included (in the Heavy Duty Package).

You can choose a mid-box—mounted in front of the standard pickup bow and behind the cab—that provides lockable storage for tools and other valuable items. The rugged, steel

The flow-through centre console gives you the option of two captain's chairs, with a floor shifter on FX4 and Lariat models. Photo © 2007 Ford Motor Co. and Wieck Media Services Inc.

construction features double-panelled doors that are accessible from both sides of the vehicle, and lock/unlock with the cab door key. Latches feature double-bitted keys and lock tumblers designed to provide exceptional security. The mid-box is available on Regular Cab with 145-in. wheelbase and SuperCab with 163-in. wheelbase.

Inside, three different instrument cluster designs give each series a distinctive look. All models feature an upscale, two-tone instrument panel. The flow-through centre console gives you the option of two captain's chairs, with a floor shifter on FX4 and Lariat models. Vehicles equipped with a 40/20/40-split-front-bench seat have a different instrument panel centre stack optimized for middle-passenger legroom.

The F-150 offers three engine choices: a 4.2L V6, 4.6L Triton V8 and 5.4L three-valve Triton V8. The 5.4L delivers 300 hp at 5000 rpm and 365 lb-ft of torque at 3750 rpm. A flex-fuel version can run on E85. Liquid-filled engine mounts ('hydromounts') on the V8 engine stifle much of its noise and vibration before it can reach the cab. Both 4x2 and 4x4 models use coil-on-shock, long-spindle, double-wishbone front suspension, which reduces unsprung weight to provide better ride and stability on choppy, broken surfaces. EB

Team Nova Scotia honoured during Skills ceremony

Members of Team Nova Scotia were recognized for achievements in a variety of trades and technologies at the Skills Excellence Awards in Halifax last month. Minister of Education Karen Casey and Skills Canada-Nova Scotia presented the group of apprentices, high school and post-secondary students with gifts of recognition for their strong showing at the Canadian Skills Competition held in Saskatchewan last June.

"These competitions are a fun way to engage and educate our youth about the opportunities that exist in Nova Scotia," said Casey. "By promoting skilled trades and technology careers to our youth, we are working to ensure the stability of our province's future workforce."

With a high demand for skilled tradespeople and technologists across Canada, Skills Canada-Nova Scotia, the Department of Education and other interested groups are reaching out to youth with the message that a career in the skilled trades and technologies sectors comes with respect, opportunity and good wages.

What do books and energy meters have in common?

Besides books, there's something else Nova Scotians can borrow from their public and community college libraries: energy meters.

Back at the end of October, energy meters became available for loan at all public and Nova Scotia community college libraries in the province. Most household appliances (up to 1800 watts) can be plugged into the meter to measure their electricity use.

The meters are by UPM, which has its corporate head office and R&D office in Calgary. They are designed to measure energy use in watts and translate the information into cost paid by the consumer. The meters can also help measure standby power—the electricity used when appliances are turned Off.

Visit www.conservens.ca/meter for more information on the meter borrowing program.

N.L. government pleased with apprenticeship numbers

Strategic and innovative investments in the skilled trades system have translated into increased numbers of registered apprentices in Newfoundland & Labrador, more individuals writing interprovincial exams, and more trade qualifiers being approved for certification. According to the same news item issued by the province's Department of Education, more people are also getting their Red Seal.

"It's a simple case of supply and demand; the demand is there and it is government's responsibility to help provide the programming and apprenticeship training," said Joan Burke, minister of education. "Clearly, many are realizing that the skilled trades can provide a satisfying career and are training for the job opportunities that are on the horizon."

Over the past two years, the Williams government has allocated $43.6 million in the areas of apprenticeship, science and technology, programming, training and infrastructure. These investments have funded new programs at College of the North Atlantic, improved infrastructure and learning resources, and effectively doubled the number of seats at campuses throughout the province.

Comparing projected numbers for 2007 with the previous year, the number of active apprentices is up by 9%, individuals challenging interprovincial exams is up by 6%, there is an increase by 5% in the number of Red Seals awarded, and the number of trade qualifiers being approved is up by 60%.

"Strengthening the apprenticeship system is one part of our overall goal to increase the number of skilled trades workers in Newfoundland and Labrador," said Burke. "Business and industry recognize they have a role to play as well, and we will continue to work with our partners to give these apprentices a chance to stay at home and help their communities grow and thrive."

Meantime, a joint communiqué from N&L's departments of Education and Human Resources, Labour and Employment described how the government is making a concerted effort at all levels to strengthen skilled trades programming and to respond to labour market needs.

The government says it has acted on numerous recommendations by its Skills Task Force to ensure the province is well-positioned to meet the labour market demands associated with increased economic activity.

Budget 2007 allocated $9.6 million to address immediate needs in the education and apprenticeship system, many of which support the report of the Skills Task Force, "All the Skills to Succeed". Some initiatives include:

- $660,000 to expand post-secondary programming in skilled trades and technology offerings at College of the North Atlantic to meet the increased demand for skilled workers in key sectors of the Newfoundland and Labrador economy;
- $567,000 for national apprenticeship standards;
- $496,000 to strengthen the participation of women, Aboriginal people and youth in the apprenticeship system, including $200,000 to expand the number of female apprentices and $200,000 to support increased participation of Aboriginal people in the skilled trades;
- $600,000 cost-shared between the Departments of Education, and Transportation and Works to increase the number of new apprentices hired annually within the public sector;
- $240,000 to deliver the power engineering program, develop new training standards and coordinate exams;
- $100,000 to establish an industrial coordinating committee to identify specific skill sets required by industry in the province; and
- $75,000 to establish 25 scholarships of $1000 to encourage youth participating in the Youth Apprenticeship Program to continue their studies at the post-secondary level and 25 scholarships of $2000 each to establish a Post-Secondary Transition Awards Program for recent Adult Basic Education graduates commencing a full-time post-secondary program.

For job seekers, employers and people in career transition, the government is spending about $1 million to expand provincial career and employment services with the establishment of six additional Career Information Resource Centres (for a total of eight in the province).

The Department of Human Resources, Labour and Employment has launched www.LMIworks.nl.ca, a dedicated website to provide online access to provincial labour market information and resources, and is investing a half-million dollars this year to hire 10 regional career information officers to work in partnership with teachers and students in the K-12 school system.

For post-secondary students, $1million is being invested to double the size of the Graduate Employment Program and help 100 more post-secondary students successful make the transition from school to work.

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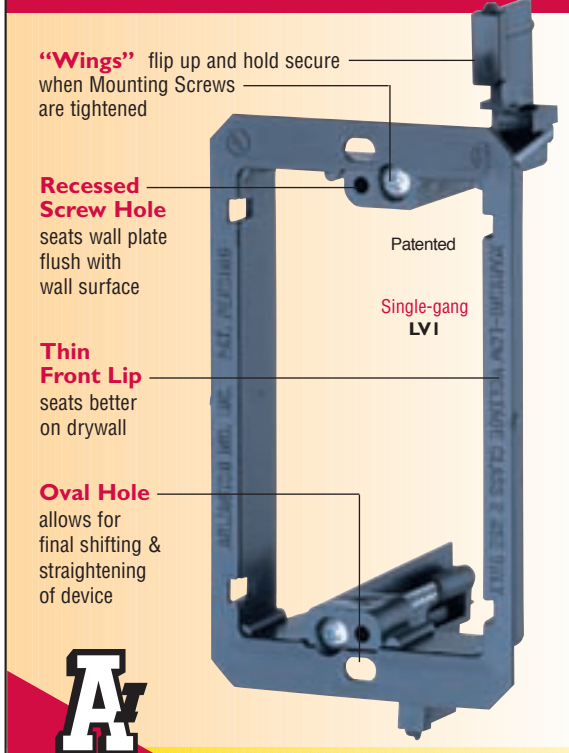
INFO NO. 33

NEW SIZES

MOUNTING BRACKETS *Just for* CLASS 2 LOW VOLTAGE WIRING

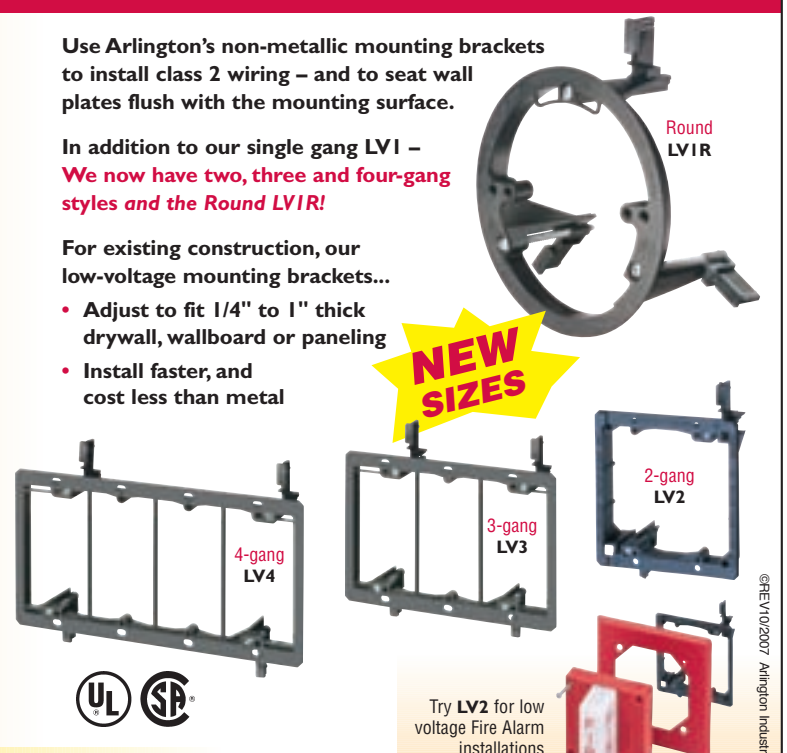


Use Arlington's non-metallic mounting brackets to install class 2 wiring – and to seat wall plates flush with the mounting surface.

In addition to our single gang LV1 – We now have two, three and four-gang styles *and the Round LV1R!*

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**



Try **LV2** for low voltage Fire Alarm installations

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Patented. Other patents pending

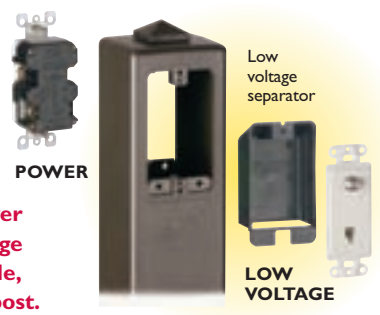
INFO NO. 34

GARD-N-POST™

ENCLOSURE & SUPPORT for OUTDOOR FIXTURES and DEVICES

Arlington's **Gard-N-Post**™ Enclosures and Supports offer the attractive, safe, and easy way to install a light fixture and/or one or two devices outdoors!

More convenient than ever! Use the supplied separator to install power and low voltage outlets outside, in the same post.



- Non-metallic, heavy-duty UV rated plastic
- Heavy duty – resists damage from lawn equipment
- No chipping or loss of color
- New stabilizer position – post sits higher above ground
- GARD-N-POST – in a variety of styles from 9" to 73" tall

CSA listed with grounding lugs

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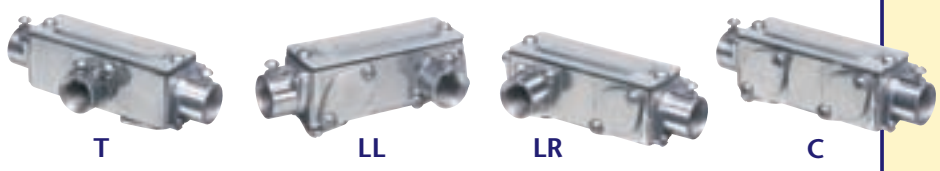
INFO NO. 35

GRAB ANYBODY.™ in METAL or PLASTIC

NEW Plastic!

It Ships as an LB...

BUT IT'S ANY BODY YOU WANT IT TO BE!



Arlington's aluminum *or plastic* AnyBODY™ ships as an LB, but converts to a T, LL, LR or C by switching the covers and threaded flanges to create the style you need.

It's easy – and convenient.

Plus, it saves you the hassle, space, and cost of stocking five different conduit bodies.

They're competitively priced with LBs with NO EXTRA COST for the normally more expensive T – and UL/CSA Listed.

Plastic
- Sizes 1/2" to 4"
- Includes three flanges with glue-in pipe joint

Aluminum
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It's all anybody needs to save time & money!

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INFO NO. 36

Reduce system design time and cost with series-connected ratings

By Lorne Hedges

The image at left shows a 10kA branch device (series-connected system), while the image on the right shows a 50kA branch device (fully rated system).

With recent trends toward increased system fault capacity, it is important to know what equipment can be safely applied on systems with high available fault currents. The most common method for documenting these maximum ratings is listing each product with Underwriters Laboratories (UL) or Canadian Standards Association (CSA).

Short circuit current ratings (SCCRs) are used to select end-use equipment for specific available fault current applications. CSA and UL require that panelboards be marked with a maximum SCCR. Testing panelboards at the maximum SCCR evaluates the structure, bus and overcurrent protective devices (OCPDs) as an entire system.

There are three systems of short circuit current protection available:

- Fully rated system
- Fully rated, selective co-ordination system
- Series-connected system

Fully rated system

In a fully rated system, the interrupting rating of all OCPDs must be greater than or equal to the available fault current at the line side terminals of each device.

Fully rated, selectively co-ordinated system

This is a fully rated system with an additional design characteristic: within the range of selectivity, the OCPD closest to the fault opens the circuit while the upstream OCPD remains closed. This limits unnecessary interruption of service to unaffected portions of the system. A system co-ordination study must be performed to ensure selectivity.

Series-connected system

A series-connected (or series-rated) system consists of a combination of OCPDs connected in series. The line side (main) device must have an interrupting rating equal to or greater than the available fault current at the line side terminals of the device. The load side (branch) circuit breaker has a lower interrupting rating and must have been tested in combination with the main device.

It is important to note that each combination of OCPDs—circuit breaker/circuit breaker or fuse/circuit breaker—must pass stringent testing to be approved for use. This testing includes component-level testing, series-connected tests and, finally, series-connected testing in the end-use equipment. UL and CSA also require regular re-qualification testing for series-connected ratings.

Effect of series-connected ratings on co-ordination

Co-ordination is the process of localizing a fault condition to restrict outages to the equipment affected. As stated above, only the OCPD closest to the fault opens. While some system designers believe that breaker co-ordination is lost when using series-connected ratings, studies conducted by Schneider Electric engineers have shown that—in both fully rated and series-connected systems—co-ordination is *not* lost.

Advantages of employing series-connected ratings

There are three primary advantages of using SCCR with series-connected ratings:

- Less design time
- Smaller equipment sizes
- Reduced equipment costs

Less design time

When selecting series-connected OCPDs it is unnecessary to calculate the maximum short circuit current levels down to the line side of the lowest branch device. Once the maximum available fault current level is defined, series-rated combinations may be selected from a manufacturer's published matrix.

Smaller equipment size

Using series-connected ratings often permits the use of lower interrupting rating branch circuit breakers, which may translate into smaller frame sizes. Smaller breakers may mean higher breaker density per panel, therefore smaller or fewer panels.

Reduced equipment cost

Series-connected systems allow for branch OCPDs to have lower interrupting ratings. Devices with lower interrupter ratings cost less and may require smaller or fewer panels; again, adding to the cost savings. Added to the equipment savings are reductions in installation costs when installing smaller or fewer panels.

Summary

Series-connected ratings apply to specifically tested combinations of OCPDs and may include circuit breaker/circuit breaker or fuse/circuit breaker combinations. System OCPD co-ordination is not sacrificed when series-connected ratings are applied. And series-connected ratings offer the advantages of less design time, smaller equipment size and reduced equipment costs.

Lorne Hedges is Schneider Electric's marketing manager for Standard LVDE. (References include Square D Data Bulletin No. 0600DB0108 and No. 2700DB9901 R11/02.)

PRODUCTS FOR LIG

Room controller for lighting

Suitable for areas with small lighting control zones, Watt Stopper/Legrand's LI-ARP moves relays into the areas they control, so you don't have to mess with complex, layered strategies for lighting control. The pack provides two relay outputs to support bi-level switching and manual On operation, and is also equipped to accept inputs from occupancy sensors and daylighting controls. By providing terminations for the loads as well as for the control inputs, the LI-ARP eliminates multiple runs of line voltage and control wiring back to a central panel location. Engineers can optimize the electrical system by feeding multiple relay packs from a single circuit breaker, fully loading each circuit. LI-ARP communicates with the company's Lighting Integrator Complete Control System via a single data line.

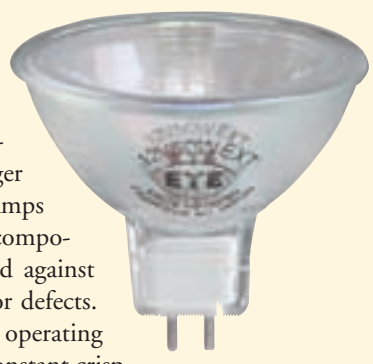
110 Watt Stopper/Legrand

LED refrigerated display lighting system

Functionality improvements to the LED refrigerated display lighting system—an ecomagination product from Lumination LLC (GE's LED business)—enable further energy savings for retailers in new and retrofit applications. Lumination technologists and engineers have redesigned the LED system to incorporate full dimming control and motion sensing. The incumbent lighting that LEDs are replacing in refrigerated display cases—fluorescent—cannot be efficiently dimmed or switched On/Off without a significant impact on product life, says GE, adding that, in contrast to cold-loving LED systems, fluorescents simply do not perform optimally in cold temperatures. A retailer incorporating motion sensors in its low-temperature refrigeration and freezer cases could program inside-the-case LED lighting to turn off or revert to any brightness level when there's no one around.

111 Lumination LLC (subsidiary of General Electric Co.)

Halogen line



Standard's Eye halogen line offers high-quality, Japanese-made lamps that prevent colour shifting and beam distortion, and have a longer lifespan. Eye halogen lamps are made with quality components and fully warranted against poor workmanship and/or defects. They provide controlled operating temperatures, long life, constant crisp white light and precise beam control. All Eye MR lamps are produced in a fully automated environment, ensuring maximum out-of-the-box performance. The filament inside is automatically adjusted, ensuring maximum lumen output and precise beam control. Each MR lamp is tested (lit) four times prior to final packaging. All JDR, JD, JT and JC lamps over 50 volts have built-in safety fuses—should a lamp fail, it will simply turn Off.

112 Standard Products

Electronic ballast with Step-Dim feature

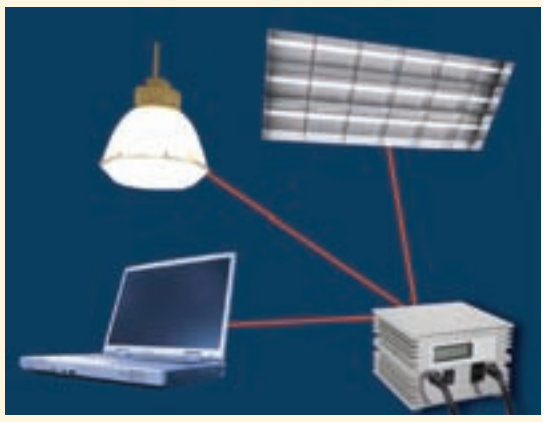
Advance has expanded its family of Optanium high-efficiency electronic ballasts to include one with Step-Dim capability for the operation of two 28W T5s. Ideal for recessed lighting applications, the ballast's design maximizes energy savings and operates from any line-voltage switching device. Compact and lightweight, it is available in two different ballast factor options (.95 and 1.15), and incorporates programmed-start lamp ignition. It also boasts Advance's IntelliVolt multiple-voltage technology, which enables the ballast to operate at 120V to 277V, 50/60 Hz. The ballast also incorporates enhanced safety features, such as Auto Restart and ballast Shutdown Mode.

113 **Advance (div. of Philips Electronics NA)**

Energy-efficient HPS lamps

TCP has added high-pressure sodium lamps to its HID product line that, the company claims, are three times as efficient and last five times longer than an incandescent bulb (24,000 hours). HPS lamps are suitable for general lighting applications, and are recommended for indoor and outdoor applications, industrial facilities and roadways. Available in 35W through 1000W, the HPS lamps provide light levels of up to 100 lumens/W. Rated for both indoor and outdoor fixtures, they produce a warm, incandescent-like colour with good brightness, and operate on standard HPS ballasts and auxiliary equipment.

114 **TCP Inc.**



Ballast control package

IEPC is offering its Vari-Ballast Control (VBC) lighting control system for fluorescent lighting applications. VBC combines solid-state electronics with on-site, remote and aggregate Web-based controls to provide customers with energy-efficient lighting control that reduces the number of ballasts and amount of re-wiring necessary to install a typical fluorescent system, says IEPC, while increasing the brightness and life of the lamps. VBC is a stand-alone energy management system in a box that reduces demand on power in real time. With VBC, lamp and fixture maintenance is accomplished by using a built-in scheduler, timer, relay and dimmer. In addition, a built-in photocell allows for automatic daylight harvesting.

115 **IEPC (Int'l Engineering Products and Consulting Corp.)**

Round Augmented Cat 6-compliant UTP cable

Berk-Tek introduced its LANmark 10G2 UTP cable that features, claims the company, the world's smallest round outside diameter of .300-in. nominal. It is designed—and guaranteed—to meet the electrical component requirements of proposed TIA-568-B.2-10 standard for Aug Cat 6 supporting IEEE 10GBase-T out to 100 metres. The design incorporates four twisted pairs cabled with three monofilament elements that reduces cable diameter. The LANmark-10G2 cable is part of the NetClear GTX 10 Gigabit UTP channel solution from Berk-Tek and Ortronics/Legrand. Together with Ortronics Clarity10G UTP TracJack modular outlets, patch panels and patch cords, NetClear GTX is guaranteed to meet or exceed all TIA 568-B.2-10 component and channel requirements.

116 **Berk-Tek (a Nexans company)**

Protective eyewear

North Safety has added the Rebel (T8100) to its eyewear line of safety products. The Rebel's design promises to deliver great performance in demanding work conditions. It has a 9-base curve uni-lens design for a wider field of view, and black/grey co-moulded, panto-scopic, non-slip adjustable temples for a more secure fit. The nosepiece is soft and adjustable for increased comfort and a snug fit, while the lenses are protected by North's 3A coating (anti-scratch/-UV/-static). The eyewear is also certified to meet CSA Z94.3 eye and face standards.

117 **North Safety Products**

Dickies FR clothing line

Workrite has launched its Dickies FR clothing line, which includes various workwear made from flame-resistant fabrics. This clothing line marks the first collaboration of Workrite Uniform and Dickies, which are both part of the Williamson-Dickie Manufacturing Co. The initial line consists of: five-pocket jeans; carpenter jeans; work shirt; and hooded duck jacket. The inaugural FR line features Indura and Indura Ultra Soft fabrics made by Westex.

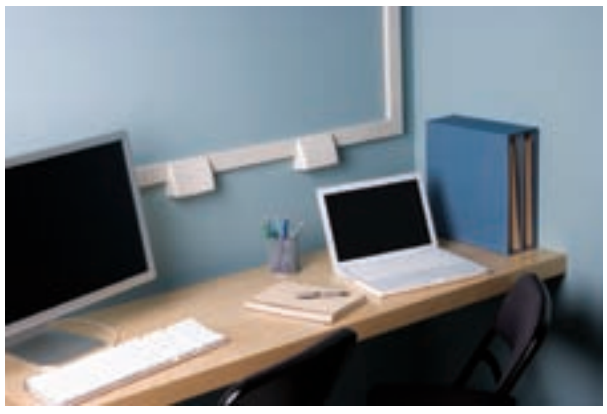
118 **Workrite Uniform**

Portable hot stamp wire marker

Energy Management's Hz2.1 portable hot stamp wire marker permanently marks wires where large, pre-planned batches based on automated equipment is impractical—wherever 120V power is available. The Hz2.1 uses heat and imprint foil to emboss alpha and numeric combinations onto wires, making a professional-looking, permanent imprint. The hand-held tool weighs about 3 lb and measures 9 x 2 x 11.5 in., and one foil roll is good for about 20,000 imprints.

119 **Energy Management Corp.**

Labour-saving divided raceway



Wiremold/Legrand offers a compact, dual-compartment raceway for jobs not requiring the extra capacity of larger-perimeter raceways or vertical drop systems. The Wiremold 2400D steel divided raceway is a convenient alternative to installing separate raceway runs and device boxes for both power and data. The downward-facing device boxes for receptacles and communications jacks feature an over-the-raceway design so they can be installed over a continuous run of raceway base. Plus, the downward-facing receptacles enable the raceway to be installed directly under chalkboards and laboratory furnishings. The raceway is FiberReady, with available fittings to ensure a gradual bend radius for fiber optic and 10G cabling.

120 **Wiremold/Legrand**

Jacketless cable designed for access control

Honeywell Genesis Series Profusion jacketless cable is optimized for access control applications, featuring a bundle of four individual shielded cables held together by a tight, continuous twist that can be easily separated for unique data or communications tasks. Profusion delivers lock power, card reader, door contact and 'Request for Exit' in a single bundle. Time savings are achieved because the cable jacket does not need to be removed during the wiring installation process, plus a single pull takes care of four cables at once. Furthermore, it does not require an adhesive to hold the four cables together; the twist design does it all. Each cable is colour-coded and features sequential footage markings.

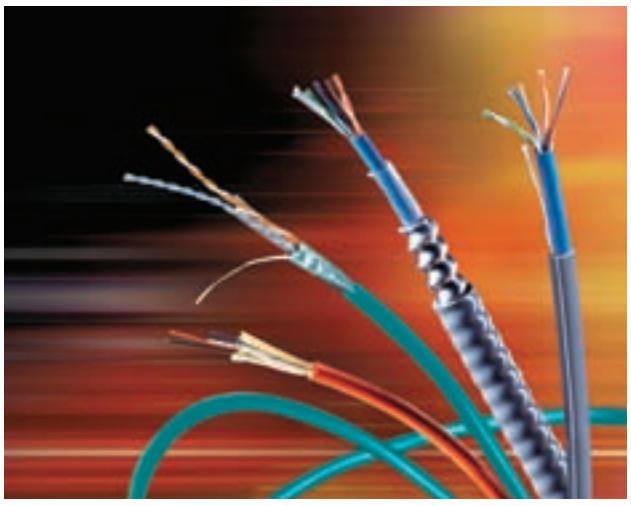
121 **Honeywell**

Environmentally resistant cord

General Cable's new line of Carol Super Vu-Tron supreme rubber cord is available in types SOOW and SJOOW and, due to its proprietary, vulcanized jacket formulation, it is virtually impossible to tear. The company also claims the cord is highly resistant to heat, cold, oil, ozone and chemicals (Super Vu-Tron Supreme can withstand temperature extremes from -50°C all the way to +105°C). It offers Class M stranding on all constructions for flexibility and tinned copper conductors for enhanced soldering performance and corrosion resistance. The jacket is now printed with RoHS, sequential footage marking and CE Mark on 10 and 12 AWG SOOW.

122 **General Cable**

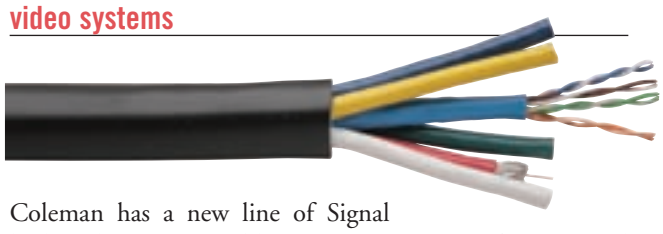
Industrial Ethernet cables



Belden has expanded its line of DataTuff industrial Ethernet cables with three new enhanced four-pair, Cat 5e twisted-pair cables, which feature the company's Bonded-Pair technology for good electrical performance. Among the products is No. 7935A, a low-smoke, zero-halogen, unshielded enhanced Cat 5e EtherNet/IP-compliant cable featuring 24 AWG solid bare copper conductors with rip cord, polyolefin insulation and a .030-in. industrial-grade, sunlight-resistant. The cable is rated NEC/CEC: CM FT1. Another product, No. 7936A, differs from the first in that it is shielded with 24 AWG stranded TC drain wire and overall Beldfoil shield. Its rating is NEC/CEC: CMR/CMG FT4. Finally, No. 7937A is a waterblocked/burial version of 7936A with PE inner jacket and sunlight/oil-resistant Black PE jacket.

123 **Belden**

RGB cables for commercial/residential video systems



Coleman has a new line of Signal high-end RGB coax cables to support a range of commercial and residential video system applications. The mini coaxes can be used to transfer HDTV or traditional video, digital/analogue audio and cable TV between electronic components. A three-coax version of the CCI line transfers the RGB signal from video sources to the displays. A five-coax version can be used with projectors that require horizontal and vertical synchronization, in addition to the RGB signal, or for a combination of digital and analogue audio. CCI's new line of bundled precision video coax now includes Cat 5e cables that provide solutions for additional applications, such as Internet telephone, networking, IR control, audio/video over baluns and automation.

124 **Coleman Cable Inc.**

HP server console switches—KVM over Cat 5

HP introduced server console switches—KVM over Cat 5—with 16- and 8-port models. They integrate KVM and serial devices into a single management console for all servers including blades, network devices and infrastructure products—even in heterogeneous environments. New firmware and hardware provide support for attaching serial devices to the switch and for preemption when connected to an IP console switch. Requiring no software to be installed on the target servers, the server console switches can manage up to 256 servers from a single KVM console. They use Cat 5 UTP cables to facilitate cable routing between devices and allow for field termination of custom cable lengths to eliminate coils of cabling in the rear of the rack.

125 **HP**

MX Series media converters

AFI's V'nes MX Series media converters allow the connection of Ethernet or UTP to fiber optics, allowing one to take advantage of the speed, virtually unlimited bandwidth capacity and overall cost efficiencies of fiber optics for VDV transmission. The converters connect 10/100 Fast Ethernet or 1000Mbps GigE twisted-pair to FO systems with wide bandwidth over short or long distances. The series incorporates optional single-fiber WDM technology, combining dual-fiber cable into a single cable for greater cost savings. When combined with Commander Series switch products, the MX Series provides cost-effective solutions for converting any number of ports from twisted-pair to fiber.

126 **American Fibertek Inc.** EB

How a tiny hole in the wall almost put one company out of business.

Behind that hole lies a critical path to ground. In fact, dirty power from poor grounding threatens your company's very existence. Take the example of a business headquartered in a 70's-era building. With over 4,000 data errors per month, PC boards failing repeatedly and computer monitors going down every six months, dirty power almost spelled disaster.

The main culprit was the building's grounding system. It simply didn't meet the demands of today's sophisticated electronics.

To solve the problem, a network of copper-clad ground rods, driven deeply into the earth, was tied with oversized copper cabling to a new main grounding plate. For reliable paths to ground, dedicated wiring was used instead of relying on the metal conduit. And separate, upsized neutrals were installed for each phase. Since installation, data errors and equipment problems have virtually disappeared.

Protect your business from the "ground" up. Call **1-877-640-0946** for case studies and our information-packed CD-ROM. And visit us at ***www.coppercanada.ca***.

CANADIAN COPPER & BRASS DEVELOPMENT ASSOCIATION

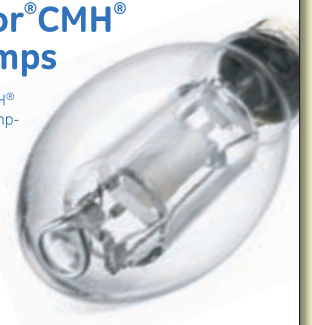
INFO NO. 38

PRODUCT SHOWCASE

For more information, enter the appropriate number on the Complimentary Subscription/Info Card found in this issue

GE Consumer & Industrial
Lighting

GE ConstantColor® CMH® 20 Watt PAR Lamps



These exclusive GE ConstantColor® CMH® ceramic metal halide lamps provide lamp-to-lamp colour uniformity, consistent excellent colour over life, plus highest operating efficiencies. Available in PAR 20 and PAR 30.

- Long Life
- Highly Efficient
- Excellent Colour Rendering

imagination at work

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39

GE Consumer & Industrial
Lighting

GE F32T8 Watt-Miser® (30W)

GE's T8 Watt-Miser® series of fluorescent lamps are an example of GE's energy savings initiatives in action. GE's Watt-Miser® gives up to 5.5% reduction in wattage compared to Standard T8 lamps.

- TCLP Compliant
- Long Life
- Energy Savings

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The Intellivue, from Holophane, is a high performance fixture framed by sleek minimalist styling. Ask us how our 3 lamp fixture can now provide the same, or more, light as typical 4 lamp units in a ceiling ambient of 40 degrees or higher. With 110 years of innovation behind us we invite you to Experience Lighting's Best!

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41

Introducing Holophane's new Vantage Mini. A low profile luminaire that is the optimal solution where maintenance, sanitation, safety, and energy conservation are key concerns. The Vantage Mini is UL/CUL for wet location, IP66 rated and NSF International certified for C-2 splash zones. Make Holophane your standard and Experience Lighting's Best.

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www.holophane.com

42

Caterpillar Inc. Offers New Electric Power SpecSizer

Caterpillar Inc. introduces the new Electric Power SpecSizer tool for generator set sizing and specifying. Considering factors such as site conditions, load characteristics and required performance, SpecSizer provides accurate and timely technical data, robust load models and optimized algorithms to assist in the selection of a competitively sized generator set that best suits a customer's needs.

For additional information, visit http://go.cateps.com/a087 or contact your local Cat® dealer.

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Going "green" without sacrificing performance

Philips is setting a new standard with their 4' T8 fluorescent lamps using ALTO II™ technology. These new lamps have 50% less mercury than the original ALTO, and still offer the same superior performance levels as before. That means you don't have to sacrifice lamp life, light quality, or energy, to help your company be more sustainable.

For more information contact Gregg Bennett at 905-201-4100 or visit philips.com.

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LIBRARY

For more information, enter the appropriate number on the Complimentary Subscription/Info Card found in this issue

Wire and cable pulling lubricant brochure

Ideal has published a guide to its full line of commercial- and utility-grade lubricants. Highlighted in the guide is Velocity, an ultra-low-friction cable pulling lubricant, as well as Aqua-Gel, ClearGlide and Yellow 77. The guide's "Select-A-Lube" enables you to instantly select the right lubricant for the application based on job type, construction, indoor/outdoor location, temperature and length of pull.

For more information, visit www.idealindustries.com or call (800) 435-0705.

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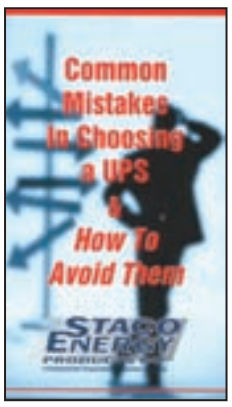

UPS selection guide

"Common Mistakes in Selecting UPS and How to Avoid Them" identifies 17 misconceptions and mistakes that can occur when selecting uninterruptible power supplies (UPSs), and advises readers on avoiding them. It is suitable for any industry where the continuous functioning of electrical equipment and computers is vital, such as data centres and manufacturing lines.

You can download a copy from Staco Energy Products Co. at www.staco-news.com, or e-mail info@stacoenergy.com.

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Electrical products for petrochemical industry

A 48-page colour catalogue from Appleton entitled "Global Protection" targets the petrochemical industry, highlighting the global protection offered by the company's line of explosion-proof lighting, controls, plugs and receptacles, cable glands, heat tracing systems, and power quality products. The catalogue also provides an educational overview of IEC versus NEC/CEC hazardous locations.

For a free copy, call (800) 621-1506 or visit www.appletonelec.com.

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Enclosure catalogue

Fibox's 176-page, 4.0 enclosure catalogue features eight RoHS-compliant, corrosion-resistant enclosure families, which are available in polycarbonate (plus selected availability in ABS, aluminum and glass fiber). Offered in hard copy and online, the catalogue helps you select enclosure models for industrial, instrumentation, process control, outdoor and hostile environment applications. All families feature cUL approvals.

To request the free catalogue, e-mail sales@fiboxusa.com or call (888) 342-6987.

48

Datacom catalogue

Hoffman's DataCom Catalogue (Vol. 5) features a selection of open-frame racks, cable management systems, wall-mount cabinets and racks, free-standing cabinets, thermal management solutions and modular enclosure systems. A chapter on outside plant enclosures thermal management solutions for protecting components from detrimental influences that can lead to excessive heat and humidity inside the enclosure.

To obtain your free copy, visit www.hoffmanonline.com or call (800) 355-3560.

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Asymmetric indirect lighting brochure

Lam Lighting (a Genlyte Group company) has a new brochure describing its Horizons asymmetric indirect product line. The full-colour, 20-page document showcases the range of products and applications of performance indirect lighting technology. Photos of the dozens of models of Lam indirect asymmetric lighting are included with specification data and photometric diagrams.

Copies of the brochure are available by calling (714) 549-9765 or visiting www.lamlighting.com.

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ADVERTISER INDEX

BY KRIS PASZKOWIAK, P.ENG.

Conductors over or near buildings

Zero clearance lot line is a situation in which a building is set to the lot boundary, leaving very little space between it and existing high-voltage conductors. Developers try to maximize the use of a lot, sometimes overlooking the inherent electrical safety concerns arising from inadequate clearances. Similarly, installing high-voltage conductors over or near buildings without the required horizontal and vertical clearances can lead to electrical contact fatalities.

That said, figuring out what constitutes safe clearance depends on applicable codes in your jurisdiction. For instance, the Ontario Building Code, Subsection 3.1.18.1., states:

Where a building is to be constructed in proximity to existing above-ground electrical conductors of a voltage not less than 2.5kV and not more than 46 kV,
a) the building shall not be located beneath the conductors, and
b) the horizontal distance between the building and the conductors shall not be less than 3 m.

It goes on to explain that where a building is to be constructed in proximity to existing above-ground electrical conductors of a voltage exceeding 46 kV, the clearance between it and the conductors shall conform to the requirements of CAN/CSA-C22.3 No. 1, Overhead Systems.

The Canadian Electrical Code (CEC) Rule 12-312, Conductors over Buildings, states that conductors shall not be installed over buildings unless a deviation has been allowed under Rule 2-030. However, CEC Section 36, High-Voltage Installations, amends the general requirements of Section 12.

CEC Rule 36-110, Guarding of Live Parts and Exposed Conductors (and Table 33) specifies the required horizontal clearances—including protuberances—to be 3 m for maximum system voltage not exceeding 46 kV and 3.7 m for 69 kV.

For vertical ground clearances, you must refer to Table 34. For voltages exceeding 69 kV, CEC also requires clearances to be in accordance with CAN/CSA-C22.3 No. 1. There's an additional requirement in CEC Rule 310 (3) pertaining to high-voltage power lines spanning over 50 m: the vertical ground clearances specified in Table 34 must be increased by 1% of the amount by which the span exceeds 50 m.

A key point of interest is the note in CEC Appendix B, which states that the spacing and clearances shown in Tables 33 and 34 differ intentionally from those found in CAN/CSA-C22.3 No. 1. The note explains that the stated clearances for wires and conductors are *minimum values* related to *maximum specified loads and service conditions*, representing design limits rather than clearances for construction or daily operation. "Clearances provided at the time of construction," it goes on to say, "under ambient conditions then prevailing, must by design be sufficiently greater than the stated minimum clearances to ensure that actual clearances that will result under the maximum specified loads, and service conditions will not be less the stated minimum clearances."

Essentially, CEC rules apply *at the time of installation* while CAN/CSA-C22.3 No. 1 applies *at the time of system design*.

The code, as well as CAN/CSA-C22.3 No. 1, prefer not to permit high-voltage power conductors over buildings when there's a suitable alternative. When there is none, then additional measures must be taken to ensure the safety of those who will be working on or near the building. (In Ontario, this option only applies to installations over 46 kV.)

Common solutions to clearance problems include relocating the line, increasing clearances or going underground. Correcting these issues once a building is completed (or near completion) can be both difficult and expensive, which is why effective communication with your municipal building department prior to construction is the key to avoiding these additional costs. The alternative of ignoring the situation is unacceptable, as it can lead to injury or death from electrocution. EB

Kris Paszkowiak, P.Eng., has taken his many years of experience—most of those with Ontario Hydro and the Electrical Safety Authority—and launched CodeSafety Associates, a new 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. Contact CodeSafety Associates at (905) 599-2702 or kris.paszkowiak@gmail.com.

Questions and answers compiled by ESA

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 January's Electrical Business.

How did you do?

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

Question 1

Non-current-carrying parts of tube stands, tables and other apparatus in an installation of diagnostic imaging installations shall not be bonded to ground.

a) True **b)** False

Question 2

All metal raceways and all non-current-carrying metal portions of fixed or portable equipment used in finishing processes—regardless of voltage—shall be bonded to ground in accordance with Section 10.

a) True **b)** False

Question 3

35 (1-1/4) rigid PVC conduit shall be securely attached to hangers or to a solid surface with the maximum spacing of the points of supports not greater than:

a) 750 mm **c)** 1.5 m
b) 1.2 m **d)** 1.8 m

Answers to Code Conundrum

Electrical Business October 2007

Q-1: Electric vehicle charging equipment rated at ___ or more shall be supplied by a separate branch circuit that supplies no other loads except ventilation equipment intended for use with the electric vehicle supply equipment.

b) 20 amp. Rule 86-300.

Q-2: Wiring of an essential electrical system in a patient care area shall be permitted to occupy the same raceway as non-essential wiring.

b) False. Rule 24-302(3) which states: (3) The wiring of the essential electrical system shall be kept entirely independent of all other wiring and equipment and shall not enter a fixture, raceway, box or cabinet occupied by other wiring except where necessary... (a) in transfer switches; and (b) in emergency lighting fixtures supplied from two sources.

Q-3: All receptacles that are part of an essential electrical system in a patient care area shall be what colour?

Red. Rule 24-106(7), Receptacles in basic care areas, which states: (6) All receptacles that are part of an essential electrical system shall be coloured red, and no other receptacles shall be so coloured.

GE Consumer & Industrial
Lighting

vancouver 2010
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Lighting that clears the air, and your conscience.

A large, high rise office building that switches out 1,500, 3-lamp fixtures from standard T8 lamps to Ultra F32T8WM lamps utilizing an electronic ballast system will avoid CO2 emissions by 55,000 lbs. annually, which is equivalent to planting 8 acres of trees per year or removing 5 cars per year from U.S. roads. Does that sound unbelievable? Not if you use ecomagination℠. It's our commitment to imagine and build innovative solutions that benefit our customers and society at large.

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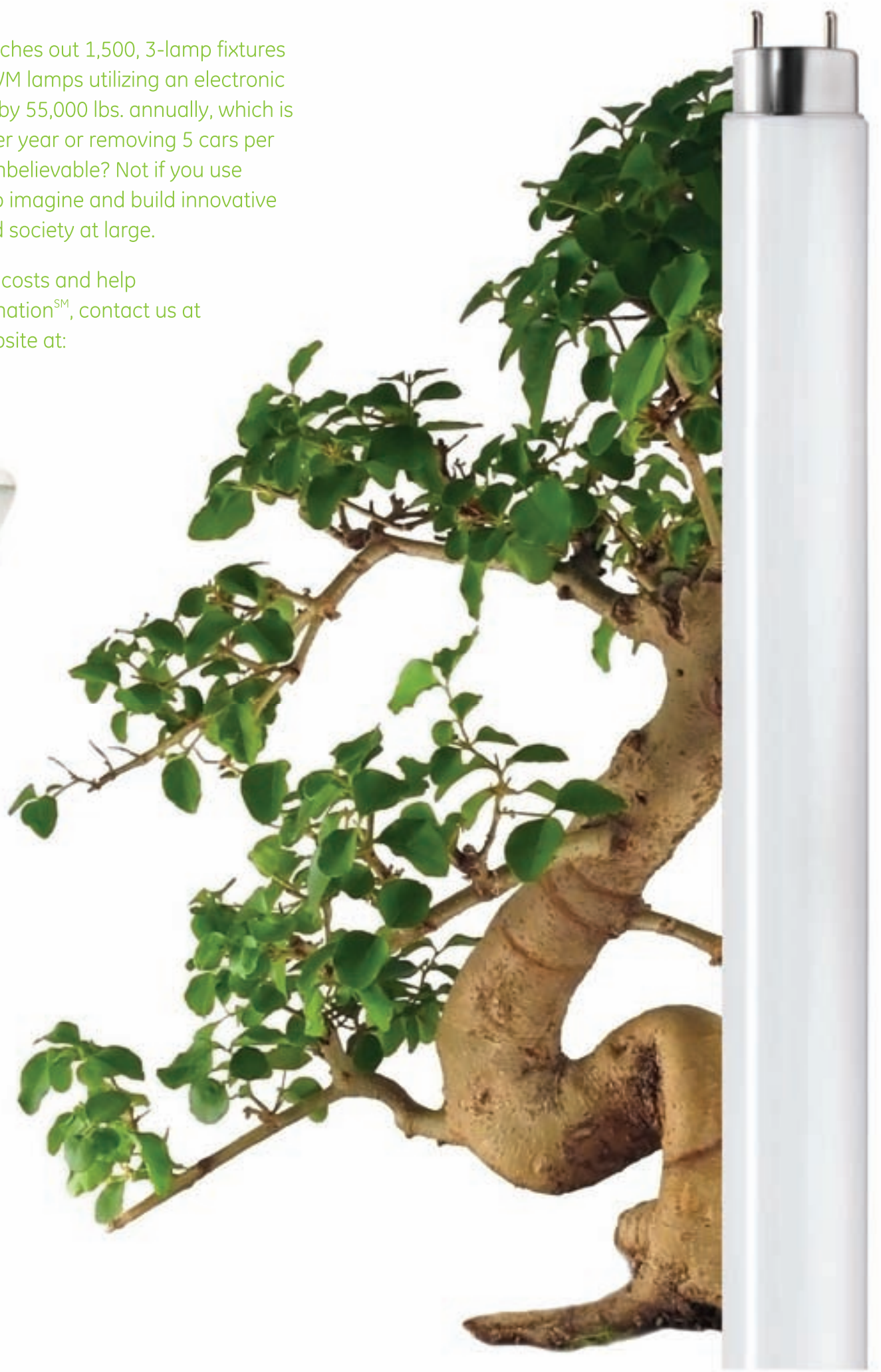

*@ 10 cents per kWh, 4,400 burn hrs., 1,000 fixtures
* Products may not be exactly as shown

imagination at work

INFO NO. 62