

# Electrical Business

JUNE/JULY 2011



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■ Also in this issue...

- New work truck accessories
- Managing plug load
- McMaster students divine sustainable energy savings



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Regardless of company size or type, here's something all should consider.

## Brighter futures by thinking outside the box

I recently attended the Electricity Sector Council's biennial Bright Futures in Canada Conference entitled "Innovative Solutions for a Sustainable Workforce". This national gathering is dedicated to the electricity and renewable energy industry workforce, and received delegates from Newfoundland & Labrador to British Columbia, and all points in between.

According to ESC projections, electricity organizations will experience an annual shortfall of between 3000 and 4500 workers by 2012. Hence, ESC's efforts in helping industry meet the needs for a skilled, safe and sustainable workforce. As such, this national conference (which happens every other year) brought together folks from industry to discuss how they're tackling issues of training and development, recruitment, etc.

Suzanne Desrosiers, chief HR officer with NB Power, explained that the promise of the smart grid may help alleviate the "demographic crunch"; as the grid becomes more intelligent, the thinking is that fewer workers may be needed. However, she does caution that anyone involved in HR must help shape that smart grid vision to ensure it accounts for a shrinking workforce that is, by nature, averse to change.

Desrosiers also gave examples of how NB Power has had to think outside the box when training its service techs on a new, in-truck computerized system. First, the company sent its techs into a classroom to learn how to use the computers. "That didn't work so well," Desrosiers admitted. Then, the utility had computer experts ride along with the techs and teach them in the cab while on the go and, lo, the "acceptance level went way up".

Greg Comis is the manager, training & development, with ATKO Electric and, despite wearing a suit jacket, he ironed his whole shirt (you had to be there). Comis discussed ATKO's formal Subject Matter Expert (SME) Network for ensuring that years of built-up company intelligence doesn't just disappear when someone retires.

Being an ATKO SME is not a full-time job, and the SMEs are less than 5% of the workforce. They're also not necessarily 'teachers', nor are they guys who are just a year away from retiring. No, the SME Network is a little more forward-thinking than that; the SMEs are actually found all over the organization across a range of career levels. But they are the go-to guys; the ones who make things happen and show others how it's done. Again, most importantly, the SME Network is a formal, on-the-books program—nothing willy-nilly about this.

Speaking of process, Don Lowry, president and CEO of EPCOR, talked about putting in place a governance structure that revolves around key business objectives. He insisted that EPCOR does as well as it does because its people are motivated to continually improve processes, putting them ahead of the competition. "Stretch your people," he argued. "People want to be motivated. They want to do a good job." He also added that, when an employee lets him down, it's usually one who is *under* motivated.

Good information for anyone's business, regardless of company size or whether you're EPCOR or NB Power, and something you should consider. **EB**

*Anthony Coshan*



On the cover  
and page 22

### Proactive approach to voltage imbalance can keep motors running longer, more efficiently

It is impossible to balance line-to-line voltages perfectly in a three-phase circuit, but a difference that exceeds 1% can lead to serious trouble on the plant floor. To maintain peak energy efficiency and thwart premature failure of three-phase motors, it makes sense to install adequate protective devices and periodically check for voltage imbalance at the motor terminals.

page 30

## Contents

### 13 Down with "People are our greatest asset"

It is time we banned the well-intentioned phrase, "People are our greatest asset", as it is outdated, 20th Century thinking... a phrase that holds little meaning to companies and employees alike, and does little to create a great place to work and do business.



### 16 Truck accessories abound at the Work Truck Show 2011

Besides the chassis introductions we reported on last month, a big draw at the Work Truck Show is all the accessories for your van or truck, including solutions for being more organized, or lighting your outdoor work area.



### 26 Managing plug load is the next challenge for energy-efficient buildings

A quick look at a typical office reveals numerous pieces of equipment constituting that building's plug load. The U.S. DoE estimates this plug load represents 26% of energy use in commercial offices, which is why any energy-saving strategy should include managing a facility's plug load.



### 28 What you should know about eLearning

In the not-so-distant past, training in the electrical and other construction trade industries meant an automatic trip to the nearest training facility to take a course on a new product or updated safety protocol. However, with today's advancements in online learning, eLearning can be just as effective as traditional classroom learning.



## DEPARTMENTS

- 4 Industry News
- 9 Personalities
- 11 Mind Your Safety  
Entering outdoor substations (Part 2)
- 12 Calendar
- 30 Products
- 34 Code File  
Electric surface heating systems
- 34 The Code Conundrum



page 30

**Ideal Supply celebrates its 30th branch location**

Ideal Supply ([www.idealsupply.com](http://www.idealsupply.com)) has opened its 30th branch location in Flesherton, Ont., a 3200-sf store which will be home to Ideal Supply and NAP A Auto Parts' full line of automotive products. The location opened for business on April 4 and is located at 94 Collingwood Street.

Ideal Supply is a distributor of electrical supplies, with its Electrical and Industrial divisions aligned with Affiliated Distributors (A-D.). It is also celebrating its 85th anniversary.

Earlier this year, Deloitte announced that Ideal Supply requalified as one of Canada's 50 Best Managed Companies for 2010. The program, established in 1993, recognizes excellence in Canadian owned and managed companies.

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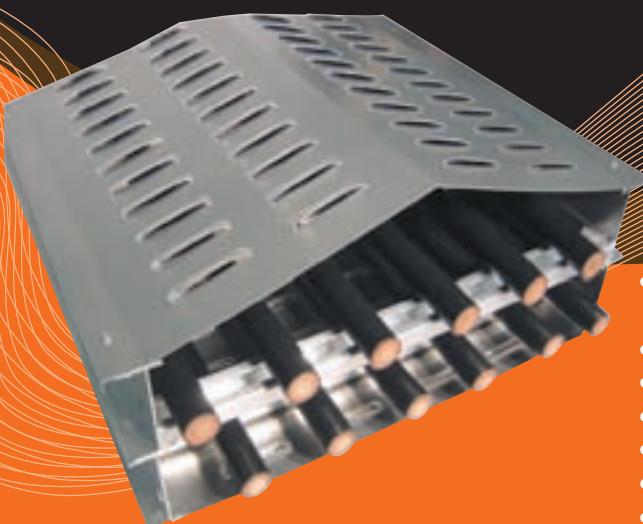
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BUSINESS

**Thanks to YOU, EBMag.com among the Top 15 Canadian B2B magazine websites**



Electrical Business' website, EBMag.com, has been included in the "Top 15 Most Visited Websites for Canadian business-to-business (B2B) magazines".

Like other professional organizations, Electrical Business (including its website) submits itself to rigorous third-party auditing—in this case, to BPA/CCAB.

"First and foremost, a big thanks to our loyal magazine readers and regular website visitors. They are the ones who truly deserve the credit for our achievement," beams Anthony Capkun, editor of Electrical Business, adding, "They not only take the time to visit us regularly online to spend time with our community, but they also refer others to EBMag.com for its regular news updates, multimedia reports from industry events, and so much more!"

"Not unlike the industry we serve, which requires third-party certification for electrical products, Electrical Business believes whole-heartedly in third-party scrutiny for itself," asserts John MacPherson, publisher of Electrical Business. "Integrity, legitimacy, transparency... that's how we choose to go to market."

BPA uses page tags to measure traffic, and strips out bot/spider and internal traffic before releasing its numbers. In essence, BPA has created the most stringent, objective measurement possible for validating website visitor statistics.

"We've invested, and continue to invest, considerable man-hours and resources into our digital product offering," adds MacPherson, "so it's really gratifying to receive third-party recognition of our efforts."

**McMaster's energy audit of Hamilton schools could save \$2.4 million annually**

The engineering faculty and students at McMaster University, Ont., have completed a two-year energy audit of local schools that identifies the energy conservation measures that could reduce energy

costs by almost \$2.4 million annually.

The measures, presented to officials from the Hamilton-Wentworth District School Board and the Hamilton-Wentworth Catholic District School Board, range from recaulking windows, adding insulation and using more efficient lighting to new investments in advanced heat recovery systems and boilers, and solar and wind generating systems.

"We found that the school boards are already involved in implementing many of the more

achievable energy conservation measures at their schools," said Samir Chidiac, professor of civil engineering at McMaster and one of the lead organizers of the audit. "But they need support and decision tools to install technologies that will generate the greatest savings over the long term."

The energy audit, which was sponsored by Union Gas, was conducted by seven mechanical and civil engineering students working on co-op terms, supervised by two McMaster research engineers.

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"Through the Union Gas EnerSmart program, we help our business customers make smart investments in energy-efficient equipment and technologies," said Mel Ydreas, vice-president of marketing and customer care at Union Gas. "The McMaster students and their advisors have clearly demonstrated investment opportunities for Hamilton schools to significantly reduce energy costs while also reducing their environmental footprint."

A screening methodology, referred to as archotyping, was developed to carry energy audit on 153 schools in two years. The methodology consists of grouping schools on the basis of the building characteristics, operation, electrical, heating, cooling and ventilation system properties and, in doing so, they said they were able to reduce the time that would normally be required to fully audit all schools by six years.

**EECOL, Gescan Sonepar, Merit, Sask. Sun Electric support SYA Industry Scholarship Program**

More youth apprentices will benefit from the Saskatchewan Youth Apprenticeship (SYA) Industry Scholarship Program thanks to the support of 17 industry organizations totalling \$350,000. Among the 15 companies that contributed \$10,000 to the scholarship program are:

- GESCAN Division of Sonepar Canada Inc.
- Merit Contractors Association Inc.
- Saskatchewan Construction Association
- Saskatchewan Sun Electric (1975) Ltd.

Also, two companies contributed \$100,000: EECOL Electric and PCL Construction Management Inc.

"Our member companies know the importance of attracting skilled labour to move our industry and our province forward," said Michael Fougere, executive director of the Saskatchewan Construction Association. "Providing scholarships to our youth is an important tool in the tool box that will help attract youth into the construction trades where there are solid and rewarding careers."

The scholarship was initiated by industry partners and the Saskatchewan Apprenticeship and Trade Certification Commission (SATCC) to profile skilled trades as first choice careers for high school graduates. It provides forty \$1000 scholarships each June to eligible high school graduates who have completed the SYA program.

"The SATCC is thrilled with the success of the Saskatchewan Youth Apprenticeship (SYA) Industry Scholarship Program, supported by industry partners and the SATCC," SATCC Board Chair Garry Kot said. "The scholarship fund is a way for industry to give back to apprenticeship training and trade certification. It is essential that we encourage Saskatchewan youth to become more aware of the wonderful career opportunities in the skilled trades. These scholarships mirror the great support and success we've already experienced with the SYA Program."

The SYA Program allows high school students to explore career opportunities in the skilled trades by providing awareness, research and hands-on experience. Interest in the SYA Program continues to grow since it was first offered province-wide in the 2006-07 school year.

Employers and industry associations interested in contributing to the SYA Industry Scholarship Program are encouraged to contact the SATCC at (877) 363-0536.

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**Cooper B-Line expands Canadian capabilities with new Calgary facility**



Cooper B-Line ([www.cooperbline.com](http://www.cooperbline.com))—a provider of support systems and enclosure solutions for engineered facility subsystem applications—has “officially” announced the opening of its new manufacturing facility in Calgary, Alta., which makes local cable tray system delivery possible in just one to three days. (We say “officially” because we learned of this at the Alberta Electrical League’s Learning Expo weeks ago.)

“About a year ago, we identified the need for expanded fitting assembly offerings in the Canadian market,” explained Kevin Kissling, president, Cooper B-Line. “We’re pleased to now provide area contractors with the fast turnaround times they’ve asked for through local production in Calgary.”

At 30,500 sf with 6000 sf devoted to fitting assembly for cable tray systems and cabling support options, the facility will support the cable management needs of electrical contractors and distributors in the commercial, industrial and oil & gas sectors on both small- and large-scale projects.

“Our Calgary facility is yet another example of our ongoing commitment to customer service,” added Kissling.

Cooper B-Line’s cable tray products and corresponding accessories meet CSA International and cUL standards.

**MCEE 2011 draws huge crowds – attendance up 18%**

The aisles were packed for the 2011 edition of MCEE ([www.mcee.ca](http://www.mcee.ca)), the self-proclaimed largest show in Eastern Canada for electrical, lighting, plumbing, HVACR and hydronics. This year’s show took place in April at Place Bonaventure in Montreal.

EBMag was there as an exhibitor, too (Booth 984). With camera in hand, we caught with friends in Quebec and met some new ones. (Visit [tinyurl.com/5u4xk78](http://tinyurl.com/5u4xk78) to see our photos from the show.)

Produced by the Corporation of Master Electricians of Quebec (CMEQ), Corporation of Master Pipe Mechanics of Quebec (CMMTQ), the Canadian Institute of Plumbing & Heating (CIPH), and the Corporation



des entreprises en traitement de l’air et du froid (CETAF), MCEE combines four previous shows and claims to be Canada’s only major industry event in Eastern Canada in 2011.

According to MCEE, 6483 industry members attended the event this year-up 18% from 2009:

- Contractor attendance increased 18% to 1958.
  - Wholesaler attendance increased 56% to 837.
  - Engineer attendance increased 8% to 532.
  - 398 manufacturers, agents and associations exhibited.
  - 114 new products were featured in the New Product Showcase.
  - The 18 seminars drew record attendance, with “standing room only” at many of the sessions.
- The date for the next MCEE is set for April 17-18, 2013.



**Franklin Empire opens St-Jerome Quebec branch**

Franklin Empire, headquartered in Montreal, Que., opened a new branch in St-Jerome (56, rue Maisonneuve). This is the distributor’s 16th location.

Franklin Empire is an independent distributor serving commercial, contractor and industrial markets across Quebec and Ontario. “We wish Alain Valade (branch manager of St-Jerome and Mont-Tremblant) and his team the best of luck in St-Jerome,” says the company.

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## CEA paper explores current and future state of Canada's electricity sector

The Canadian Electricity Association (CEA, [www.electricity.ca](http://www.electricity.ca)) has released a discussion paper, "How Will We Power Canada's Future? Our Electricity System in Transition", which presents a vision of Canada's electricity sector, explores how to build our nation's future electricity system,

and offers policy considerations for realizing this vision. It is available at [www.KnowYourPower.ca](http://www.KnowYourPower.ca).

According to CEA, today's electricity system that serves Canada so well was built for a population of 20 million, and we are now reaching a population of 35 million.

"Canada must now make decisions about how to improve the existing electricity grid," stresses the paper. "Our goal has



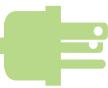
always been sustainable, reliable and affordable power for all Canadians—but how do we get there? [KnowYourPower.ca](http://www.KnowYourPower.ca) has been created to promote a dialogue... a place for thoughtful Canadians to learn more and to have their say on one of the biggest issues facing us today."

"Through [KnowYourPower.ca](http://www.KnowYourPower.ca), and with 'How Will We Power Canada's Future?' as the starting points, CEA hopes to stimulate the conversations, and ultimately the actions, that will make the Canadian electricity system's bright and promising future a reality," says the association.

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### Ontario signs MoU with Siemens Canada

The Province of Ontario has signed a Memorandum of Understanding (MOU) with Siemens Canada that will help the province "continue to turn the corner through investments in industry, energy, healthcare and infrastructure".

Siemens Canada, in partnership with the province, will strive to:

- Establish global centres of excellence in Ontario focusing on smart grid development, electric vehicle technology, wind and solar power, water treatment, energy conservation, and state-of-the-art manufacturing.
- Provide university Masters programs, apprenticeships and co-ops, as well as help develop post-secondary curriculum to help build a world-class workforce specializing in the clean technology sector.

"Today's signing reconfirms Ontario's strong leadership and continued growth and prosperity driven by key partnerships between business and government," said Roland Aurich, president and CEO, Siemens Canada. "The challenges faced by today's cities can only be solved through innovation and technology and we look forward to working together with this government towards solutions for a stronger Ontario." **EB**



It is with sadness that we report the passing of **Stephen Tatrallyay**, EBMag's "From the Legal Desk Columnist", who recently passed away, peacefully, at Stratford General Hospital. "As a specialist in Construction Law, Stephen's legal insights were invaluable to Electrical Business' readership," said Anthony Capkun, EBMag's editor. "I will miss working with him." As expressions of sympathy, donations can be made to the Stratford General Hospital Foundation, MRI Fund [www.sghfoundation.org/mri/mri.html](http://www.sghfoundation.org/mri/mri.html).

Congratulations to **Sheri McLean** of the **Electrical Contractors Association of Alberta** ([www.ecaa.ab.ca](http://www.ecaa.ab.ca)), who celebrates 20 years as executive director of that organization. And the milestones don't stop there! Next year, ECAA celebrates its 50th anniversary.



**EB Horsman & Son's** ([www.ebhorsman.com](http://www.ebhorsman.com))

**Tim Horsman**, the fifth-generation Horsman involved in the company, has become its president and CEO. He has been involved in the electrical industry for more than 20 years, and has worked in all areas of E.B.

Tim Muldoon

**Tom Muldoon** Horsman's business over the last 12. Tim currently chairs the BC Electrical Association (BCEA) and sits on the Affiliated Distributors (A-D) Executive Council. Meantime, **Tom Muldoon**, former president and general manager of the company for the past 17 years, has moved to the position of chair. In 2000, Muldoon became the first non-family partner in 100 years. Muldoon has sat on the board of various industry associations, including BCEA, Electro-Federation Canada, A-D Canadian Products Committee and advisory councils for Hubbell, Thomas & Betts, GE Canada, Osram Sylvania, Siemens Canada and Leviton Corp.

**Glenn Sturdy**, chair of Ontario Electrical League's board ([www.oel.org](http://www.oel.org)), along with the Selection Committee announced the appointment of **Stephen Sell** as OEL president, replacing **Mary Ingram**.

**Jim Gilmore** has joined the **Gerrie Electric** ([www.gerrie.com](http://www.gerrie.com)) team as regional branch manager, responsible for the locations in London, St. Thomas and Woodstock, Ont. "His experience in both the manufacturing and distribution areas of the business, his knowledge of the London and surrounding area market, and his drive for customer success make him a welcome addition to our team," says the company.

**Chess Controls Inc.** ([www.chesscontrols.com](http://www.chesscontrols.com)) has appointed **Darryl Turgeon** account manager for parts of Northern Ontario, including Marathon, Wawa, Sault Ste. Marie, Blind River, Espanola and part of Sudbury. His responsibility includes sales & marketing of Siemens, Rittal, Liebert and Asco products. Additionally, **Corinne Arsenault** has been named account manager for Eastern Ontario (Pickering to Cornwall and Ottawa).

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Richard Gingras

**Nathalie Pilon**, president, **Thomas & Betts Canada**, ([www.tnb-canada.com](http://www.tnb-canada.com)) announced the appointment of **Richard (Rick) Gingras** to the position of director, Business Process Improvement, where he will be responsible for leading “continuous improvement initiatives across sales and administrative processes”. Gingras’ role is

to seek out opportunities to improve the overall customer experience using lean tools to reduce waste and to improve, standardize and document business processes. Formerly director of Logistics, Gingras has been a member of the Thomas & Betts family since 1977. In 2003, he received his black belt training in Lean Six-Sigma, and has helped roll out the Lean Six-Sigma culture within Thomas & Betts over the last eight years.



René Marineau

EBMag was there when **Electro-Federation Canada (EFC)** presented the **2011 Industry Recognition Award** to **René Marineau**, past president of **Canlyte Inc.** (retired), during EFC’s AGM awards luncheon in April. Described as “the most-approachable company president”, Marineau had been with Canlyte Inc. for 35 years. He began his career in the electrical industry as a marketing manager and, in 1992, worked his way up to become president of Lightolier-CFI. Then, in 1999, he took up his final post as president of Canlyte.

The Industry Recognition Award is presented annually to an individual who has influenced the Canadian electrical and/or electronics industries. Recipients demonstrate strong leadership through their personal and professional industry involvement, and symbolize dedication, balance and achievement in regional, national and/or community activities.

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**Atkore International** ([www.atkore.com](http://www.atkore.com)), formerly **Tyco International’s Electrical & Metal Products** business) underwent several executive organizational changes. **John P. Williamson** will serve as president and CEO, replacing **Nelda Connors**, who resigned to pursue other opportunities. Williamson joins Atkore from ITT Corp., where he held various leadership and management roles, including corporate VP and director for Operational Excellence. **Ed Kurasz** is president of the Pipe, Tube & Conduit division. Most recently, he served as the global VP Pipe & Tube division, with responsibility for mechanical and structural tube, standard pipe, fall protection and fence framework. **Bob Pereira** is named president for the Cable division, with responsibility for pre-wired armoured and metal-clad electrical cable (AFC Cable). Meantime, **Steve Elsdon** is named president for the North America Cable Management Systems division, with responsibility for managing metal framing and cable tray systems sold under the brand names Unistrut, PowerStrut and TJ Cope. Finally, **Roger Vaught** is named VP for the Conduit and Fittings product lines with responsibility for managing metal, aluminum and PVC conduit and associated fittings sold under the brands of Columbia-MBF in Canada, as well as Allied Tube & Conduit in the U.S. and Mexico. **EB**

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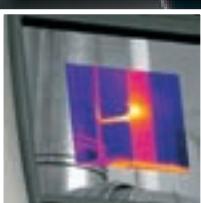
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Dave Smith

mind your safety **EB**

## Entering outdoor substations

Part two



(At the end of Part 1 in May 2011, Dave described how to visually assess the condition of an outdoor substation, and how to enter it.)

**L**ook for other workers. If you see vehicles inside and work is going on, then perhaps you don't need to be there. No one ever plans an accident, and many accidents happen because of human intervention... so if humans are already in there intervening, why be there if you don't have to?

To be in an outdoor substation, you must understand the dangers of induction. When you do not understand electrostatic and electromagnetic induction, you are not qualified to enter a substation. The system is continuously trying to energize everything metallic for as far away as it can. One of our Ohio farmer students parked his combine under a high line and, when he went to grab the rail to step in the next morning, he said the electrostatic inductive discharge flattened him.

A western utility lost a senior lineman several years ago when grounds installed the afternoon prior had current induced on them electromagnetically by the next morning. Even though he had remarked on several tingles, a direct contact electrocuted him.

I have an excellent video from a client's site showing electrostatic induction on an unused messenger line attached from an insulator inside their substation to an insulator 7 feet up on the eaves of their administration building outside the substation. I had 21 electricians, including the supervisor, in absolute amazement at my tic tester beeping 18 in. away from this unused line they had all been walking under for years. Be very aware of induction: it's deadly, but hard to recognize potential instances of it. Tingling is only one clue.

Do a closer visual inspection, especially at the transformer insulators, for any signs of loose connections, heating or any other noticeable problems. When you are experienced in substations, you turn on your gut: it is well proved that

our gut is part of our radar system and, when something doesn't feel right in our gut, then it may very well not be. Evolved over millennia, your gut instinct is your early warning system. Listen to it.

Look for lines that are going into the substation and connecting to insulators but are isolated. A particular client's substation was deenergized, and two workers went up the substructure to work; when they completed their work, the first worker retraced the path he came up. The second worker, thinking he would take a shortcut, came down the side of the substructure, and stepped onto an insulator on the side of the structure. The cable feeding into this insulator was dead-ended, yet still energized, and nobody had realized it during the lockout procedure. The resulting electrocution and fall were fatal. So, choose your path in carefully, and follow your steps out exactly as you came in.

Stay away from equipment and lines. If you don't have to walk under any lines, don't. If you do, walk exactly in the centre of all substructure equipment and not under any of the lines. If you are following an experienced worker and they are not following this practice, then follow exactly behind them. They may want you beside them to discuss things but, if they don't, follow behind them by 10 to 15 paces. Use them as a voltmeter; if there is a problem, they'll encounter it first.

But know this: should a problem arise, you will be unable to help. However, it is incredibly rare for problems to occur in a well-maintained substation. Should an accident occur, retrace your steps exactly, keeping your feet close together.

Until next time, be ready, be careful and be safe. © **EB**

*Canada Training Group has been providing consulting services to industry since 1980; Dave Smith, the president, can be reached at davesmith@canada-training-group.ca. At www.canada-training-group.ca, you will find this article (and others) available to you. Feel free to use them to support your own safety program and other initiatives.*

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# Down with “People are our greatest asset”

## Creating great places to work and do business

Sid Ridgley

**I**t is time we banned the well-intentioned phrase, “People are our greatest asset”, as it is outdated, 20th Century thinking... a phrase that holds little meaning to companies and employees alike.

We see and hear this cliché all the time, mostly in a company’s Vision/Mission and/or Values Statement from presumably enlightened senior executives, who use the phrase as a means to suggest they actually care about the people who look after customers while creating value for all stakeholders. (It is true there are some executives who back up their use of this phrase with hardcore dollars and emotional currency but, sadly, they are the exception and not the rule.)

### Seven reasons to ban the phrase “People are our greatest asset”

**1** The cliché has been so abused that it has lost its credibility with just about everyone in an organization. Actually, the phrase is more likely to incite anger and negativity in workers.

**2** Our 20+ years of conducting employee satisfaction and organization culture surveys tell us that one of the top five issues in most organizations today is “trust of senior leaders”. This is strictly a leadership issue; using the phrase and not living up to it creates a trust gap. The result? People show up for work, but they have intellectually and/or emotionally quit a long time ago.

**3** In many organizations, the top Human Resources executive reports to someone other than the COO or president. So much for notion of people being the greatest



asset. (By the way, ‘Human Resources’ is another out-dated term.)

**4** When the top HR person isn’t reporting to the president, they are often reporting to the CFO (chief financial officer)—mistake No. 2 in most cases. This perpetuates the notion that people, like photocopiers, are assets that can be accounted for, bought and sold. Who among us likes to be thought of as property?

**5** Almost every organization talks about employee engagement. Were the phrase “People are our greatest asset” even remotely true, then employee engagement wouldn’t be anywhere near the issue it is in most organizations. The reality is that ‘employee engagement’ is an emotional-based outcome, not a program. But the “people are assets” mindset encourages a belief that engagement is something that you manage: so let’s send out a few memos, have meetings, put up posters and have executives talk about employee engagement. *Hello?* This from the same execs perpetuating the term “Employees are our greatest asset”? (Am I alone in seeing the humour in this?)

**6** Dumb HR policies that demonstrate the truth about how the organization views its people as assets. The first one is where an organization has an attendance management program. Hey, if people aren’t showing up for

work, that is not an attendance management problem! The second is the HR practice of bell curving employee performance, which replaces human judgment with a mathematical formula stating that X percentage of your workforce has to be rated at the bottom while Y percentage has to be rated at the top.

**7** In times of economic challenge, what are the first items to be cut from the budget? Training, travel, advertising... then employees.

### What is an employer to do?

First you must understand that the *cost of personnel* is not the same *as their value*.

The second is to take a hard, long look at the culture in your organization; employee engagement and/or poor performance may not be skills issues, but rather the unintended consequences of a defensive workplace culture.

Third, consider re-focusing HR activities and programs toward *talent development*.

Fourth, recognize that your people cannot create value when your manufacturing, distribution, product line or customer care practices are not competitive. There is a symbiotic relationship among all of these things.

Finally, ban the phrase “People are our greatest asset”. Develop a new one... one that sparks a *sense of movement*. Here is my kick at a new phrase: “Our people create value for customers and all stakeholders”. What would your phrase be? **EB**

*Sid Ridgley is an experienced corporate executive and certified speaking professional specializing in helping leaders create great places to work, do business and invest in. Sid can be reached at sridgley@simulcorp.com.*

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# Truck accessories abound at the Work Truck Show 2011

Anthony Capkun

Last month, we brought you a ton of news regarding chassis unveiled at the Work Truck Show 2011 (as well as related videos at EBMag.com). In this issue, we look at some accessories available for your trucks. (Remember, when you see the Video Icon, it means there's an associated video at EBMag.com.) Besides our videos from the Work Truck Show 2011, we also have a photo gallery. Check out the Galleries page at EBMag.com.



## ● TEREX AL-4L & AL-5L LED LIGHT TOWERS



Terex (www.terex.com) says it is the first to introduce battery-powered LED light towers: the AL-4L and AL-5L. These light towers provide end users up to 10 hours of runtime with clean, crisp LED lighting, says the company. The LED technology offers the benefit of immediate lighting with crisper lighting capabilities compared to 4000W metal-halide models. As battery-operated LED units, the light towers eliminate engine noise and emissions. They also provide a five-times longer bulb life compared to metal-halide lights, insists Terex.

Low light pollution and sharp side cut-off reduces road glare to motorists, making the AL-4L and AL-5L suitable across many applications. The Terex AL-5L offers a standard 8kW generator for charging its on-board batteries and is capable of charging up to three additional LED light towers.

## ● WEATHER GUARD NISSAN NV SOLUTIONS



Knaack LLC and Weather Guard Van Solutions ([www.weatherguard.com](http://www.weatherguard.com)) unveiled customized van storage equipment for the Nissan NV Commercial Van, featuring driver-friendly bulkheads and a range of shelving, specialty storage and roof rack options that promise to meet the needs of professional contractors and field service/repair professionals.

Weather Guard developed customized Nissan NV bulkheads that not only keep the drivers safe, but provide an extra 4-in. of room to stretch out the legs or recline the seat, boasts Weather, compared to other van bulkheads on the market. The company offers the Nissan NV bulkhead in standard- and high-roof models, along with a complete lineup of bulkhead accessories, such as hard hat, fire extinguisher and extension cord brackets, literature holders, and First Aid Kit and safety reflector kit trays. And, with the Dog Hatch door, storing 10-ft. of pipe and lumber inside the van is possible.

Within the cargo area are up to 90-in. of Jumbo steel shelving in which to keep tools and equipment secure and organized, with 44-in. and 59 1/2-in. long shelves designed for both the standard- and high-roof models. A 51-in. retainer lip is available for all shelving units that help to keep tools and equipment from rolling around on the floor while the van is turning or stopping abruptly.



Weather also offers a variety of storage units such as locking shelf doors, locking parts cabinets, and locking file drawers to keep items more secure from theft or loss. All van storage equipment is manufactured using 18-ga steel and comes in Armor Tuf powdercoat in Brite White, designed to brighten up dark van spaces, and features a limited lifetime warranty.



## ● A.R.E. PARTNERS WITH STRATTEC TO OFFER BOLT ONE-KEY LOCK TECHNOLOGY



Photo A. Capkun

Commercial truck cap manufacturer A.R.E. ([www.4are.com](http://www.4are.com)) has partnered with Strattec Security Corp. to provide the automotive supplier's Bolt one-key lock technology on its Deluxe Commercial Unit (DCU) truck caps. A.R.E.'s DCU truck cap, made of fully welded aluminum frame construction, currently features Strattec automotive-grade lock cylinders in folding T-handles on all doors for added security. The Bolt lock systems within the cylinders are designed to permanently program themselves to the specific vehicle's ignition key, eliminating the need for multiple keys to operate the truck cap.

"One of the biggest problems that fleet managers have is drivers losing or breaking keys, which can result in unnecessary downtime, lost man-hours and security issues," said Jim Blayne, commercial/fleet division sales manager, A.R.E. "The benefit of the Bolt technology is that it saves commercial users time and money while offering one-key convenience for the entire vehicle."

Here's how it works: when drivers insert their ignition key into the lock cylinder, spring-loaded plate tumblers move up and down until they are matched exactly to that key. The first time the key is rotated, the cylinder is uniquely coded to only that key. When the key is removed, the cylinder moves into the locked position. When the key is turned again, it will rotate to the unlocked position.

"Our patented design means that any number of locks in the BOLT series can be set to one key, allowing drivers to use their single ignition key to not only lock their vehicle, but their truck cap doors, toolboxes, trailer hitch locks and any other equipment professionals use on a daily basis," said Strattec director of new market development, Mike Long. "And because the locks feature automotive-grade security they offer higher quality, durability and corrosion resistance."

The Bolt system will be standard later this summer on 2012 model year A.R.E. DCUs for domestic trucks (GM, Ford and Chrysler) only.



## ● TOMTOM BUSINESS SOLUTIONS UNVEILS PRO 7150

TomTom ([www.tomtom.com](http://www.tomtom.com)) unveiled a new navigation device for the North American market: the PRO 7150 from TomTom Business Solutions (the business unit of TomTom dedicated to commercial vehicle fleets) offers improved route guidance and faster route calculation to help drivers save time spent on the road.

"The TomTom PRO 7150 enables fleet operators to navigate with greater ease to their destinations via the fastest routes, which ultimately allows them to spend more time with their customers and less time on the road," said Michael Geffroy, VP sales North America.

The PRO 7150 features lifetime traffic updates to help drivers avoid traffic delays and TomTom IQ Routes, which evaluates routes based on actual traffic speeds rather than posted speed limits to recommend the fastest route for the time of day and provide more accurate arrival times. The device also features premium maps of Canada and the U.S., and Mexico with lifetime updates. Additionally, with Eco Routes, fleet drivers are guided via more fuel-efficient routes, saving the fleet money and reducing the impact on the environment.

The new device is equipped with: a 5-in., capacitive touchscreen; intuitive software that helps drivers route to any destination within a few taps; new click and lock mount for securing the device, and more.

As part of the TomTom WORKsmart solution, the PRO 7150 offers connectivity to allow for easy fleet management and access to LIVE Services. TomTom LIVE Services give the professional driver access to LIVE Traffic information, as well as Speed Cameras, Local Search and TomTom Weather. Additionally, WORKsmart functionality includes vehicle tracking, job dispatch, time management, eco driving and management reporting and is available via a TomTom WebFleet subscription.

The TomTom PRO 7150 will be made available in North America in Q2 2011 via authorized partners.

## ● ALSO OF NOTE!



Photo A. Capkun

Dakota Bodies Inc. ([www.dakotabodies.com](http://www.dakotabodies.com)) of Watertown, S.D., was awarded Best New Product Innovation for its Component Body.



Vern Kaufman, Pace Edwards' sales & business development manager, shows off the new retractable utility bed cover. Photo A. Capkun.

#### ● PACE EDWARDS RETRACTABLE UTILITY BED COVER

Pace Edwards ([www.pace-edwards.com](http://www.pace-edwards.com)) was displaying its new retractable utility bed cover, which is available in both manual and electric version. The cover fits most 8-ft and 9-ft models, and is made of powdercoated aluminum panels that are interlocked for strength and durability. The cover retracts into a front canister for full, easy access to the truck bed, and is fully secure when closed—even when the tailgate is unlocked.



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#### ● SORTIMO'S L-BOXX: MOBILITY WITH A NEW DIMENSION

Sortimo's ([www.sortimo.com](http://www.sortimo.com)) L-Boxx complements the company's Boxx range; it makes mobile organization portable, stackable and clickable, fitting seamlessly into the Globelyst System from Sortimo.

L-Boxx's outer shell is constructed of a polymer materials that make it strong yet light. Its insides provide a range of available inserts that offer adequate space and protection for tools and small components, and ensures they remain clearly arranged and ready at hand. Two robust snap locks make the cover easy to open and lock, while the tote handle ensures a high degree of carrying comfort.

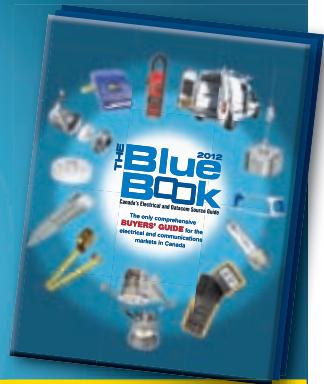
Thanks to the click system, several L-Boxxes can be clicked together, stacked and separated again with a flick of the wrist. Even several L-Boxxes linked together can be carried without problem by the topmost L-Boxx. EB



Sortimo of North America Inc.'s Timothy Galfas, senior VP mobile services development, shows off the company's L-Boxx. Photo A. Capkun.

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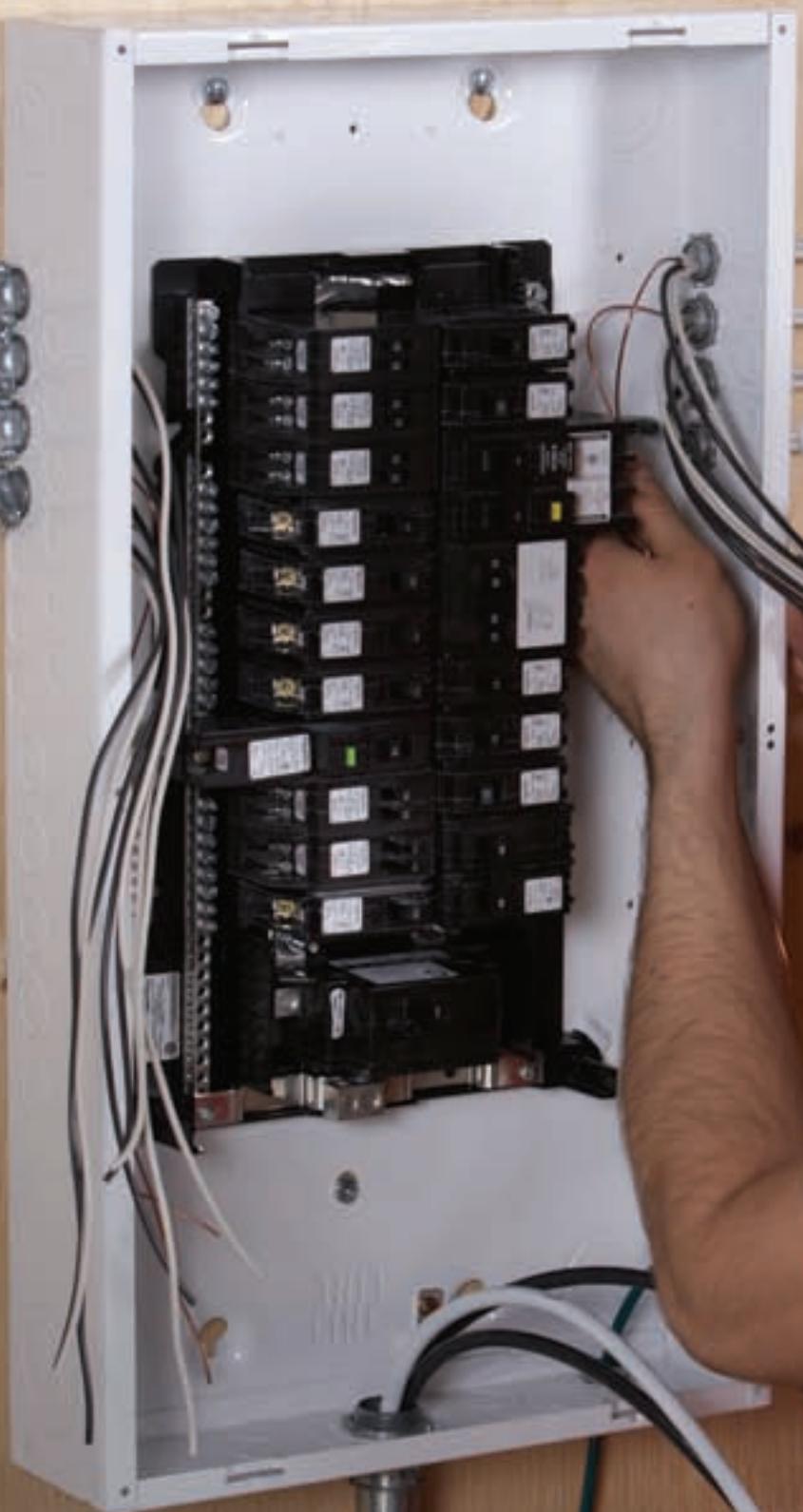
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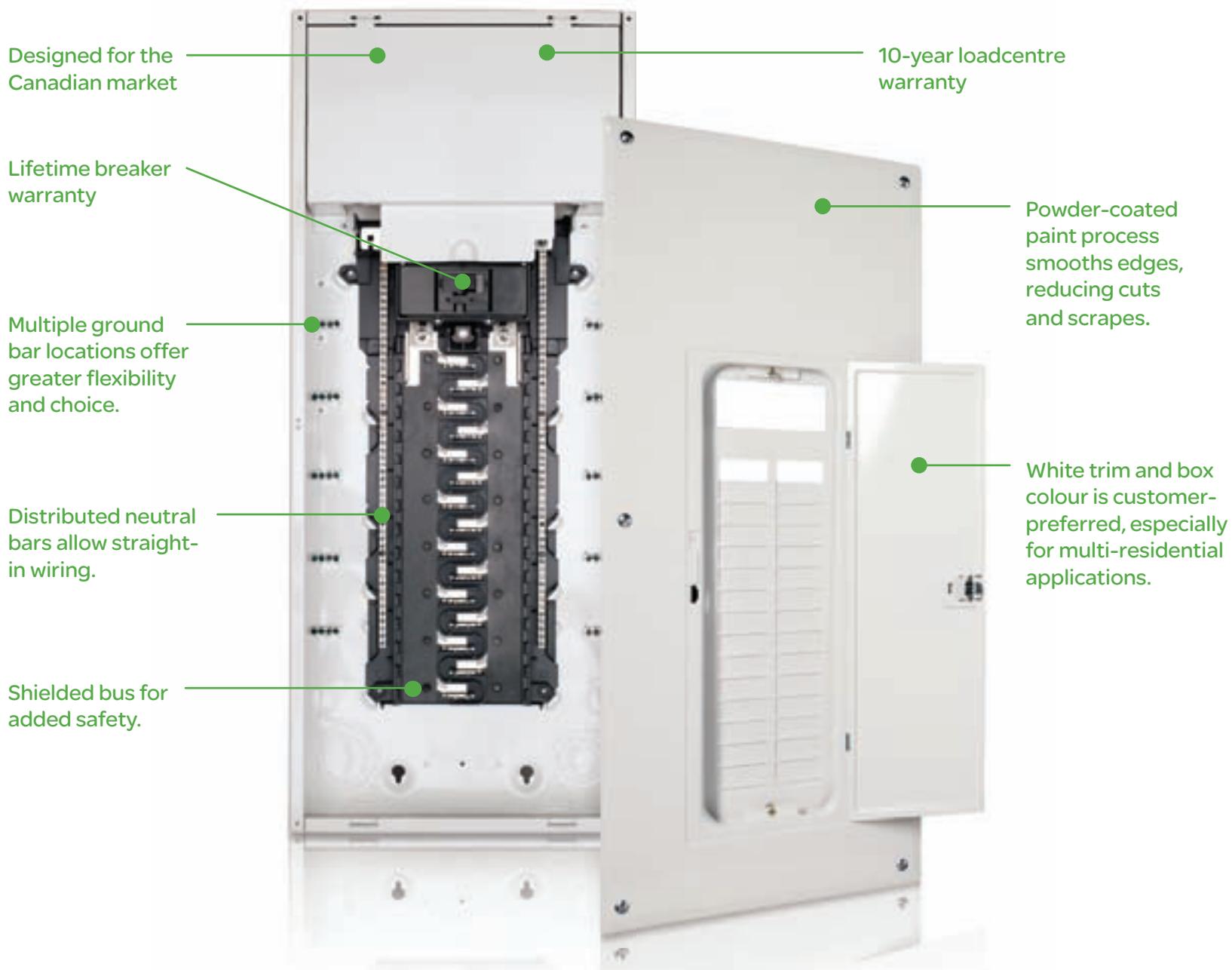
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# Proactive approach to voltage imbalance can keep motors running longer, more efficiently

Thomas H. Bishop, P.Eng.

In the real world, it is impossible to balance line-to-line voltages perfectly in a three-phase circuit. In fact, line voltages typically differ by a few volts or more. But a difference that exceeds 1% can lead to serious trouble on the plant floor. To maintain peak energy efficiency and thwart premature failure of three-phase motors, it makes sense to install adequate protective devices and periodically check for voltage imbalance at the motor terminals.

## What is voltage imbalance?

Simply stated, voltage imbalance describes the condition when the line voltages in a three-phase circuit are not equal. The effect this will have on motors and other devices in the circuit depends directly upon the percentage present. The National Electrical Manufacturers Association (NEMA) defines percent voltage imbalance as follows in its standards publication MG 1-2006 "Motors and Generators", Part 14.36:

$$\% \text{ voltage imbalance} = 100 \times \frac{\text{maximum voltage deviation from average voltage}}{\text{(average voltage)}}$$

With line-to-line voltages of 460, 467 and 450, for example, the average voltage is 459, and the maximum deviation from average is 9. Therefore, the percent imbalance is 1.96% ( $100 \times [9/459] = 1.96\%$ ).

Acknowledging possible differences in performance, NEMA MG 1-2006, Part 12.45, calls for three-phase motors to "operate successfully" at rated load

when voltage imbalance at the motor terminals is 1% or less. For reliable motor operation, be sure to keep this limiting value in mind. (Note that the 1.96% imbalance in the above example exceeds the NEMA standard.)

## Common causes

Imbalanced voltages can exist anywhere in a three-phase power distribution system. Usually, the source of the problem is unequal line loads due to system voltage imbalance, different system impedances (voltage divided by current), the nature of the loads, and the operating load on equipment, particularly motors. 'Single-phasing' (the complete loss of a phase) is the ultimate voltage imbalance condition for a three-phase circuit.

Frequent causes of voltage imbalance include:

- Imbalanced incoming utility supply
- Unequal transformer tap settings
- A large single-phase distribution transformer on the system
- An open phase on the primary of a three-phase distribution transformer
- Faults or grounds in the power transformer
- Open delta-connected transformer banks
- A blown fuse on a bank of three-phase power factor improvement capacitors
- Unequal impedance in conductors of power supply wiring
- Unbalanced distribution of single-phase loads, such as lighting
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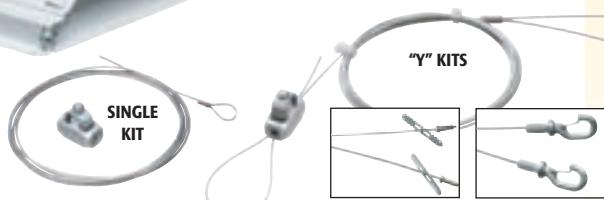
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DWB0812	10'
DWB0815	15'
DWB0820	20'
DWB0830	30'

"Y" w TOGGLES

CATALOG NUMBER	WIRE LENGTH
DWYT0805	5'
DWYT0810	10'
DWYT0810*	10'
DWYT0815	15'
DWYT0820	20'
DWYT0830	30'

"Y" w HOOKS

CATALOG NUMBER	WIRE LENGTH
DWYH0805	5'
DWYH0810	10'
DWY2H0810*	10'
DWYH0815	15'
DWYH0820	20'
DWYH0830	30'

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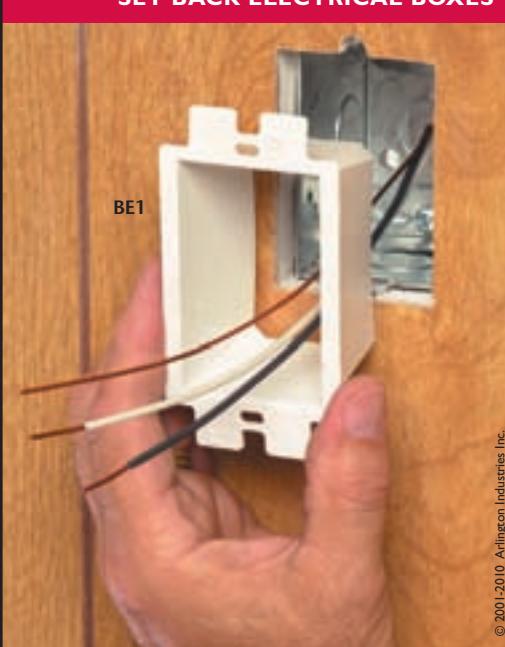
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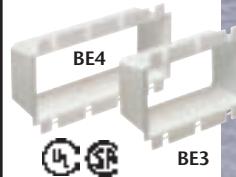
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## Effects of voltage imbalance

Voltage imbalance produces even larger phase current imbalances that can damage electric motors, generators, transformers and power supply wiring. For example, voltage imbalance of 1% at the terminals of a fully loaded motor can result in phase current imbalance of 6-10%. This raises the operating temperature of the motor, which reduces its energy efficiency and shortens its life.

The additional heating (called ‘winding losses’) is calculated by the formula  $I^2R$ , with ( $I$ ) being current and ( $R$ ) resistance. When the current imbalance is 10% (1.10), the high-current phase will have at least 21% ( $1.10^2 = 1.21$ ) more loss (loss = heat) than any other phase.

**TABLE 1: Effects of voltage imbalance on a 5 hp motor**

Characteristic	Performance		
Average voltage	230	230	230
Percent imbalanced voltage	0.3	2.3	5.4
Percent imbalanced current	2.4	17.7	40
Increased temperature rise (°C)	<1	11	60

Table 1 shows how voltage imbalance affects the current and temperature rise of a typical three-phase electric motor rated 5 hp, 230/460V, 60 Hz, 1725 rpm, and 1.0 service factor.

Each 10°C (18°F) above the rated temperature rise will shorten the life of winding insulation by about half, so even a small increase in the percent voltage imbalance could seriously damage a motor.

The 5.4% voltage imbalance in Table 1 adds 60°C (108°F) to the temperature rise, which means the life expectancy of the winding (and motor) would drop to about 1/64 of normal—a substantial and unacceptable reduction.

Voltage imbalance also can introduce harmful harmonic currents. Although beyond the scope of this article, these currents cause additional heating in motors and supply wiring (sometimes including the neutral). The percentage of harmonic current may increase significantly due to both third- and even-order harmonics in the circuit.

Other effects of voltage imbalance on motors are that the locked-rotor current of the stator winding (already relatively high) will be unbalanced in proportion to the voltage imbalance; full-load speed will drop slightly; and torque will decrease. When the condition is severe enough, the motor may not produce enough torque to reach rated speed. Noise and vibration levels also can increase due to voltage imbalance.

A word of caution: Not all voltage imbalance is created equal. The effect is more dramatic when the voltages of all three phases differ than when only one phase deviates from the other two. This is true even when the percent variation calculates to the same imbalance.

Figure 1 illustrates the typical percentage increases in motor losses and heating for various levels of voltage imbalance.

A motor will often continue to operate with voltage imbalance, though less efficiently. This reduced efficiency is caused by both increased current ( $I$ ) and greater resistance ( $R$ ) due to heating. These factors stack up, producing an exponential increase in motor heating that sometimes leads to ‘thermal runaway’ (uncontrollable heat rise), rapid deterioration of the insulation system, and premature winding failure.

## Single-phasing

Single-phase operation of a three-phase motor deserves special attention. Electrical maintenance people often rely on a motor protection device to prevent loss of phase, only to find that it did not work and the motor has failed. Single-phase operation of a three-phase motor can cause over-heating due to excessive current and decreased output capability. When the motor is at or near full load when single-phasing occurs, it will not develop rated torque and may even stall (come to a stop). The stall condition generates tremendous amounts of locked-rotor current, resulting in an extremely rapid temperature rise.

An interesting example is what would happen were a pump motor to lose a phase. Recall the formulas for AC power:

$$\text{Single phase: } P = V \times A \times \text{pf}$$

$$\text{Three phase: } P = V \times A \times \text{pf} \times 1.73$$

( $P$  = watts,  $V$  = volts,  $A$  = amperes, and  $\text{pf}$  = power factor)

Were the the three-phase motor supply to become single-phased, the output power would drop to 1/1.73, or about 58% of rated, and rotor speed would decrease significantly due to the reduced torque capability. Pump power varies by cube of the speed, so the power requirement would also drop. Since the motor current may not be significantly above rated, the overload protection devices would not trip. Still, reduced cooling at the slower speed could cause the motor to overheat and fail prematurely.

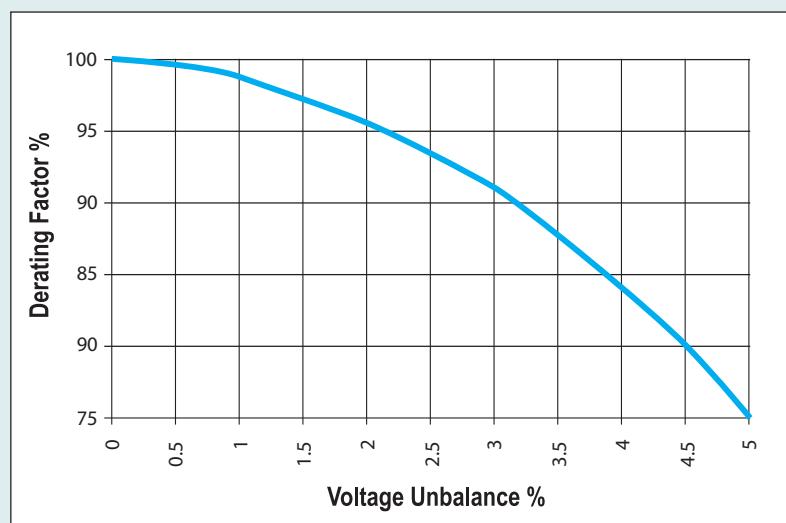
Without adequate motor protection, the stator winding may fail; the squirrel cage rotor also may be damaged or destroyed. A good reason not to rely on standard, three-overload starters to prevent single-phasing is that local, internal windings can overheat even when line currents do not exceed the setting of any one overload device. Effective protection against single-phasing requires special sensing devices such as negative-sequence voltage relays (discussed later).

A more complex scenario is what happens with several motors of different ratings on a single-phased circuit. Frequently in such cases, one of the larger motors will generate the missing third phase. (The same principle is used in commercial rotary single- to three-phase converters, except that they use capacitors to start and adjust the voltage balance.) When the motor is operating at less than rated load, its current may be too low to trip its over-current protection. In that case, smaller motors operating near rated load in the same circuit will be prone to rapid failure, because the generated phase will be about 10-15% undervoltage. (The explanation of how this undervoltage occurs is beyond the scope of this article.) The generated phase voltage will decrease further when the load on the large motor increases, thereby worsening the situation for all the motors, both large and small.

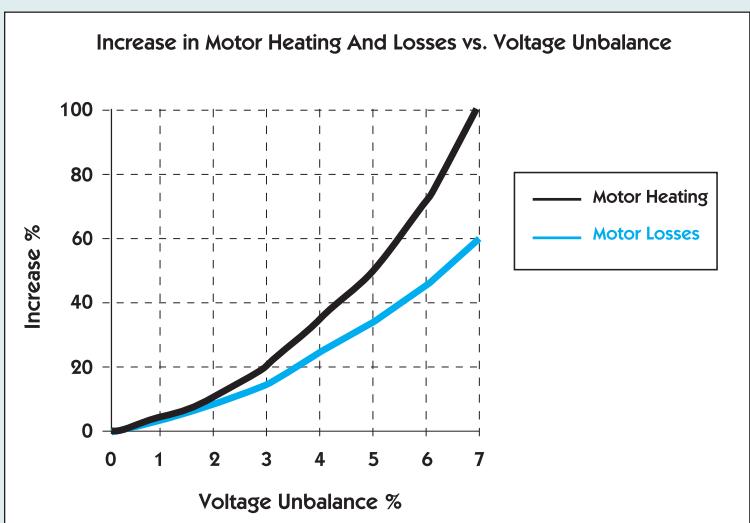
## Testing for voltage imbalance

The first step in testing for voltage imbalance is to measure line-to-line voltages at the motor terminals, following all applicable safety precautions. Likewise, measure the current in each supply line, because the current imbalance is often 6 to 10 times greater than the voltage imbalance. Suspect single-phasing when a motor fails to start. To check for this condition, simply measure the current in each phase of the motor circuit. One phase will carry zero current when a single-phasing condition exists.

**FIGURE 1: Motor heating and losses versus voltage imbalance**



**FIGURE 2: Derating factor due to imbalanced voltage**



## Correcting voltage imbalance

Redistributing and reconnecting single-phase loads can reduce voltage imbalance caused by excessively unequal load distribution among phases. Most prevalent among heavy, single-phase loads are lighting equipment and, occasionally, welders. In addition, check for a blown fuse on a bank of three-phase, power factor improvement capacitors.

Another corrective action, though generally undesirable, is to derate a motor. When voltage imbalance exceeds 1%, a motor must be derated to operate successfully. Figure 2 indicates that at the 5% voltage imbalance limit set by NEMA, a motor must be derated substantially, to about 75% of its nameplate horsepower rating.

Automatic voltage regulators (AVRs) can be used to correct voltage imbalance, as well as undervoltage and overvoltage. These devices automatically compensate for all voltage fluctuations in real time when the input voltage is within their range of magnitude and speed of adjustment. Although high-power AVRs are available, it is usually more practical to install a number of smaller units to protect the various circuits, as opposed to one large unit possibly at the plant service entrance.

Special protective relays can detect voltage imbalance and shield equipment from its degrading effects. Typically, these imbalance relays are small, relatively inexpensive microprocessors with numerous features (i.e. automatic or manual reset, programmable trip time, imbalance limit settings). When voltage imbalance exceeds a predetermined limit, most of these devices can activate an alarm, trip a control, or both. They also can be retrofitted into a motor control circuit or any portion of a power distribution system.

Negative-sequence voltage relays can detect single-phasing, phase-voltage imbalance, and reversal of supply phase rotation. These relays only sense anomalies upstream of their location in a circuit, so they cannot detect a problem in a motor or other load downstream.

Other relays that provide only limited protection in specific circumstances include phase-sequence undervoltage relays and phase-voltage relays. Phase-sequence undervoltage relays usually do not provide satisfactory phase-loss protection because, as mentioned previously,

single-phased motors may generate enough voltage to make it appear that a relatively balanced condition exists. Phase-voltage relays provide only limited single-phasing protection by preventing the motor from starting when one phase of the system is open.

## A closing point

Voltage imbalance and voltage variation are very different things. Voltage variation is the deviation of voltage from the rated voltage, and NEMA MG 1-2006, Part 12.68, allows a variation from rated

voltage of  $\pm 10\%$ . That rating assumes balanced voltages, and acknowledges that motor performance will not necessarily be the same as at rated voltage. The tolerance for voltage imbalance is only 1%, an order of magnitude less than the 10% tolerance for voltage variation. **EB**

*Thomas H. Bishop, P.Eng., is a technical support specialist at the Electrical Apparatus Service Association (EASA, [www.easa.com](http://www.easa.com)), an international trade association of more than 2100 firms in 58 countries that sell and service electrical, electronic and mechanical apparatus.*



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# Managing plug load is the next challenge for energy-efficient building

But what is a plug load, and what strategies can we use to control it?



**"Lighting has been cut so much that there is little more to be done, plug loads proportionally are the worst, but that means they also offer the most potential for savings."**

**T**ake a quick look at a typical office and you see machines like computers and copiers that are essential to operating a business. Then look at individual work spaces and note the task lights, cell phone chargers, and portable electric heaters under the desk. What these and many other everyday items have in common is that they plug directly into the building's electrical system. They constitute a building's plug load.

The actual plug load of a building depends on numerous factors, and no two buildings are exactly alike. Estimates of the contribution of plug load to overall building energy usage vary widely. The U.S. Department of Energy estimates that plug load represents 26% of energy use in commercial offices (Figure 1).

As the pie chart in the centre indicates, plug load as a percentage of total energy use can approach 50% when the HVAC and lighting—the largest users of energy—are reduced through efficient designs. According to David Kaneda, president of Integrated Design Associates (IDeAs) in San Jose, Calif., "Designs have become more efficient in lighting and HVAC. Now we're looking at how buildings actually use energy and we find that plug load is a higher and higher proportion".

As the middle pie demonstrates, improvements in lighting and HVAC efficiency have the effect of increasing plug load as a percentage of total building energy usage. Implementing a system that manages plug load can bring the energy use of a building back into proportion and save an additional 10% in energy use. This result is shown in the pie on the right.

## What is plug load?

The simplest definition of plug load is: the amount of energy drawn by devices from an electrical outlet. This can be further divided

into two general types of equipment: office equipment and miscellaneous equipment.

Office equipment is all the equipment that is needed to actually conduct business, such as desktop computers, monitors and copiers. Miscellaneous equipment covers items such as kitchen appliances, vending machines and water coolers in common areas and personal electronic devices that make workspaces feel more like home (i.e. desk lamps, radios, speakers, fans and small heaters). Miscellaneous equipment also includes plug-in media equipment such as televisions and projectors.

Yet another source of plug load—and one that is proliferating—is chargers for portable electronic devices.

Each of these devices draws power and contributes to plug load—sometimes even when they are switched off. Standby power is electricity used by appliances and equipment while they are switched off or not performing their primary function. That power is consumed by power supplies, circuits and sensors needed to receive a remote signal, keypads and displays including status lights. While less than the typical 5% in residential buildings, standby power use in commercial buildings is still a significant contributor to plug load.

Plug load equipment also generates heat and, as such, requires additional cooling capacity. However, the cooling demand of plug-in equipment is difficult to predict. "This area needs more study," says Kaneda. "But there is an impact on total building energy consumption beyond the plug load itself. More plug load means more heat generated which means more air-conditioning required."

Traditionally, design teams have considered plug loads to be outside their purview because portable plug-in electrical equipment was brought into the building by the tenants.

Figure 1

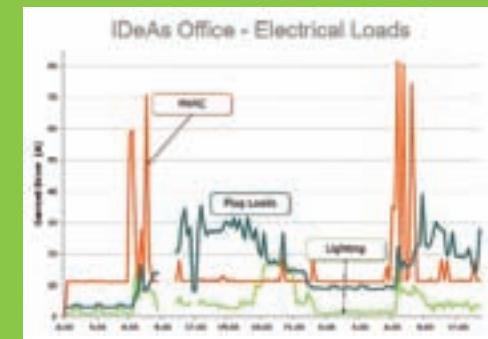
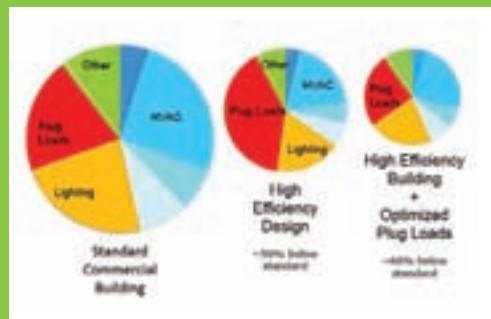


Figure 2



Thus, the challenge of controlling plug loads often falls to building managers, who must evaluate various strategies to employ.

#### Strategies for controlling plug load

As building managers become more adept at reducing the energy required for HVAC and lighting, the need to control plug load becomes greater. In the highly efficient home office of IDeAs, plug loads are nearly 50% of total energy use (Figure 2).

Is the answer to reducing plug load buying and using better equipment or turning off power? According to Kaneda, the answer is probably both.

#### More efficient equipment

Today's electrical devices are more efficient than those manufactured just a few years ago. However, in most commercial spaces there are many more electrical devices in use. For example, computers may be marginally more efficient (e.g. watts/calculation), but they are in much wider use than a generation ago. Flatscreens are more efficient than CRTs, but people today use larger screens and may have multiple screens at one workstation.

#### Turning off equipment

It is theoretically possible for individuals to turn off each piece of equipment whenever it is not in use. However, an automated approach is necessary because individuals can't be depended on to consistently turn off equipment. Any automated system must take into account what is most appropriate to turn off. Automatically cutting power to a computer every time the user steps out of the room risks a sudden loss of data, nor would a manager want to automatically turn off the break room fridge or the aquarium in the reception area every night and weekend.

There are a number of options for controlling plug load by turning off equipment. These include:

- Automated switching using timers and "smart" power strips to power off non-critical equipment and office equipment. Beyond the timing function, these devices provide no power management capability.
- Central power management systems that use software to perform specific tasks, such as enabling sleep settings on all computers on the network.
- Total control systems that provide fully integrated management controls.

#### Conclusions

As plug loads evolve into the dominant load of a building, design teams clearly must focus on strategies to reduce this critical area of energy consumption. In fact, for the first time, a green code (IGCC, in development for the International Code Council) is going to require design teams to address plug loads. This new code will require that buildings include receptacles and electrical outlets that are controlled by occupant sensor or a time switch.

According to Kaneda, the experience of developing a Net Zero building for his own business shows that plug load is the obvious target for reduction. "Lighting has been cut so much that there is little more to be done," he notes. "Plug loads proportionally are the worst, but that means they also offer the most potential for savings." **EB**

*This article is based on a white paper from Wiremold/Legrand, which we published on EBMag's sister website, [www.EnergyManagementCanada.com](http://www.EnergyManagementCanada.com), back in April 2011.*

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# What you should know about eLearning

A look at the past, present and future of online learning

Chad Hoke

In the not-so-distant past, training in the electrical and other construction trade industries meant an automatic trip to the nearest training facility to take a course on a new product or updated safety protocol.

These typical learning scenarios—whether taking place in a traditional classroom or auditorium—all have one thing in common: a one-size-fits-all approach to training. But the industry has caught on to a new approach to training—one that takes place solely online. How?

Electrical contractors and maintenance professionals no longer have to rearrange their schedules to participate in crucial training, which is more important today than ever. Online learning ('eLearning') is available 24 hours a day, seven days a week, from any place a learner has access to a computer and an internet connection. It's that simple. And eLearning allows training to fit the learner's schedule, not the other way around.

Those already familiar with eLearning may have heard the term 'Learning Management System' (LMS). Simply put, an LMS is a technology platform that allows an organization, company or association to offer and host training courses online.

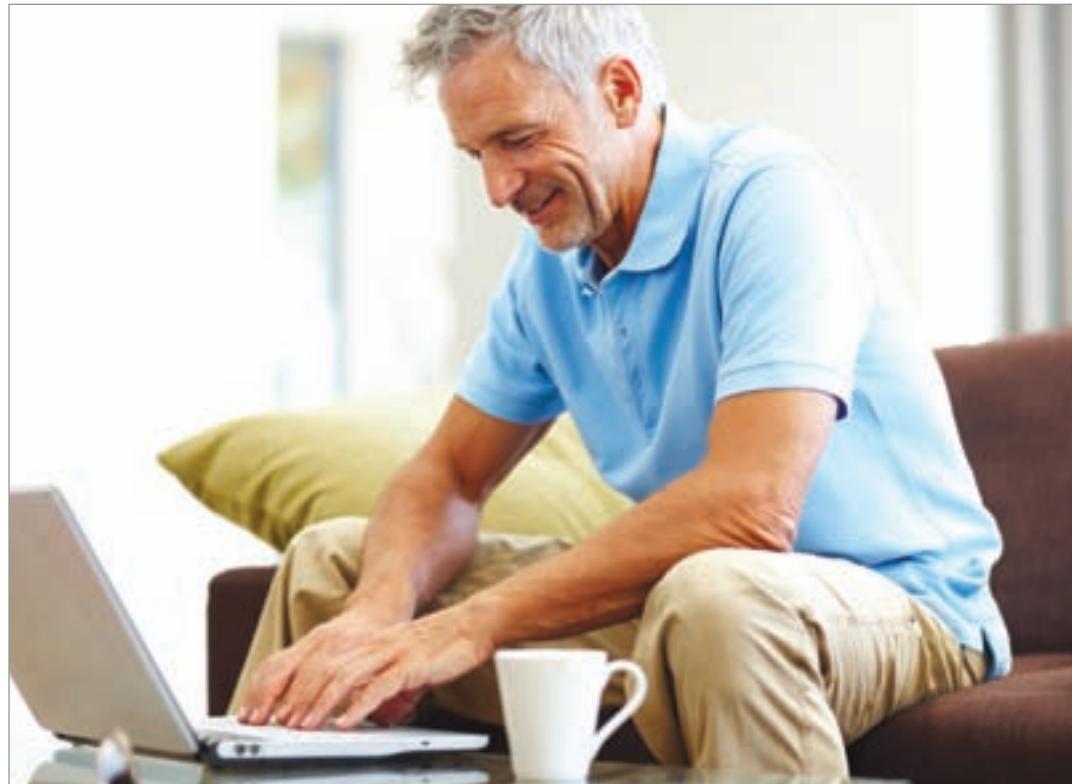
With online training, students learn at their own pace and are in complete control of the course, brushing up on what they already know and spending as much time as they need on what they do not.

There are certainly some eLearning skeptics out there. You know the type: guys who believe "If it ain't broke, don't fix it". While in-person training is still valuable—especially for those professionals who learn better in a classroom situation or need a more structured learning environment—it certainly is no longer the only option for people in need of high-quality learning. Elearning is just as effective as traditional classroom learning.

## How far has eLearning come?

Online training may have gotten a bad rap thanks to a plethora of boring, static slideshows our HR departments used to put together. These presentations were often run through a program that had to be downloaded onto all the computers and needed constant updating.

But eLearning providers have made great strides in the last decade, enriching the online learning experience thanks to cutting-edge technology and a greater understanding of how different people learn. And thanks to these relatively simple technological advances (such as wider access to the internet and faster connection speeds), professionals can now earn their continuing education units just as quickly and easily online as they could before in person.



This improved accessibility has helped improve on-the-job safety for thousands of electricians throughout North America. Many leading product manufacturers and distributors in the industry have also started creating their own courses to train electricians about their newest products and how to properly install them.

## Current trends in online learning

Courses can now be taken strictly online. This means that there is no software to install and IT departments do not have to waste hours updating all of the computers in the office. Those hosting a course—like a product manufacturer—can make updates to course content at any time and the materials are updated immediately, with no frustrating downloads required.

Instead of staring at a computer screen, learners are now encouraged to interact with their LMS through hands-on learning activities. Courses now feature drag and drop exercises, games and even product simulations designed to help learners understand complex spatial relationships and build new skills and techniques. For example, the simulations can feature animated product installations that, in some cases, provide an even more effective product demonstration than is possible with face-to-face training. Through animation, learners receive a detailed, inside look at how a product works and thorough step-by-step directions on how to safely install it.

Participating in online quizzes at the end or mid-way point of a course also has learning benefits. Professionals receive immediate feedback on how they performed, extending the learning process and encouraging self-review.

Course hosts (often called LMS administrators)

can see detailed results of courses taken and how each learner performed. This provides valuable insight to supervisors, who need to make sure employees are taking continuing education courses and keeping up-to-date with key safety requirements.

Electrical product manufacturers also benefit from detailed insights. They want to ensure their newest product is understood, and can pinpoint with which aspects installers are struggling, then improve the training.

When explaining a new concept, it is sometimes easier to show rather than tell someone what you mean. For this reason, videos are incorporated into eLearning courses to bring training to life. Integrating video allows learners to see how products are actually used and work, bringing a new dimension and practical, real-world experience to a course.

Using video has been known to both reduce training time and improve knowledge transfer and retention. By showing instead of telling, the chance for misunderstanding is greatly diminished. Quizzes can be used after, or even during, the video to verify knowledge.

While, at first, webcasts might not seem like traditional eLearning, they are increasingly growing in demand among electrical and construction personnel. Instead of travelling to the same place at the same time, webcasts facilitate learning for large groups of people. As a trainer, you can teach an unlimited audience without ever leaving the office. Webcasts can include a live Q&A session, ensuring learners don't have outstanding questions. Your message is delivered live and always available on-demand afterward.

*continued on page 30*

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## Where is eLearning headed?

Incentives are becoming increasingly more popular with online learning. Even with the best eLearning course, there's no guarantee that anyone will take it. Properly used incentives programs have been shown to increase online course enrollment up to 10 times. Course hosts can give incentives away as freely or restricted as desired. For example, students can earn them for simply passing the course or they might have to get the top grade.

Mobile learning is an increasingly popular trend in eLearning. As mobile technology continues to evolve, professionals may soon no longer need a computer to complete a required course. Soon, more courses may be accessible via smart phones or tablets, making eLearning even more convenient. This is becoming an increasingly intriguing concept for people who desire access to applicable product information in the field in mere moments. In an increasingly 'on-demand' society, you can certainly expect to see a strong emphasis in this direction.

Facebook, Twitter, LinkedIn... social media is everywhere, including eLearning. Online training is shifting away from a transactional experience between a learner and his computer. LMS platforms are making eLearning a social experience where learners can interact, share input about a course and participate in discussions—all from the comfort of home or while on the road.

Elearning is an exciting and innovative enhancement to the way we learn. The concept of a virtual classroom is no longer science fiction. LMS providers are continually adapting eLearning to fit our ever-changing society. And that means greater knowledge of the latest products, techniques and skills needed to keep electrical and maintenance professionals safe on the jobsite and on top of their game. **EB**

*Chad Hoke is vice-president of sales and marketing for BlueVolt, a leading provider of online Learning Management Systems (LMS) for the manufacturing, construction and service industries. For more information about BlueVolt and eLearning opportunities for electrical contracting and maintenance professionals, visit [www.BlueVolt.com](http://www.BlueVolt.com).*

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[www.westinghouselightning.com](http://www.westinghouselightning.com)

### Juno AccuLite Alari+ LED parking, roadway & area lighting



Juno Lighting Group, a subsidiary of Schneider Electric, introduced enhanced AccuLite Alari+ LED parking, roadway and area lighting with new LED light engines. Describing it as an architectural, energy-efficient lighting solution aimed at the commercial market, Juno says the luminaires feature field-rotatable optics, high-transmission glass, and tool-less access for wiring and maintenance, and provide customers with a low-maintenance LED option for area lighting applications. The luminaires exceed 70 lumens per watt, and have an expected 50,000-hour LED life. **JUNO LIGHTING GROUP**  
[www.junolightinggroup.com](http://www.junolightinggroup.com)



### McGill 400W HID fixture (TL40PMT0)

McGill has announced its 400W HID fixture (TL40PMT0) provides "super bright, energy-efficient and economical temporary lighting" on construction sites, and is fully compliant with the requirements of America's Energy Independence and Security Act (EISA) of 2007. The fixture outputs a 6-ft candles of illumination at a 20-ft mounting height, and according to the company, meets U.S. OSHA requirements for minimum illumination, while operating cooler than similar models, boasts the company, due to its open-air ballast. Safety features include a quick-attach wire guard combined with an "overall low-profile design that keeps the fixture out of the way of danger". **MCGILL**  
[www.mcgillectrical.com](http://www.mcgillectrical.com)

### GE debuts redesigned LED ceiling troffers and suspended fixtures

GE introduced its "dramatically designed recessed and suspended" LED lighting fixtures, which the company describes as making solid-state lighting a viable solution for widespread use in ambient applications in commercial and residential settings. The fixtures will feature an "ultra-thin light guide" with

# IPEX NEW PRODUCTS FROM IPEX ELECTRICAL SYSTEMS

## Round Floor Box and Stand



Simple yet innovative, the new Round Floor Box Stand is designed to raise the Round Floor Box off the concrete form allowing the ENT or conduit to enter the Box in a flat and straight path. Installed together, the Floor Box and Stand accommodates the different rebar and post-tensioned cable heights and slab depths found from job-site to job-site. Sold as a kit, IPEX Electrical offers the Round Floor Box and Stand conveniently packaged together as one complete product offering.

## SceptaCon™ PVC Conduit for HDD



If you're running electrical and telecommunication cable conduit under a busy road or highway, then you need SceptaCon™. SceptaCon™ links seamlessly to existing PVC conduit infrastructure and allows utilities to standardize on PVC throughout their entire electrical system. And because SceptaCon™ is made to the same high standards as our Scepter Rigid PVC Conduit, contractors and electrical utilities can be assured of the same level of quality – above ground and below.

## Save Time & Money with Kwikon® Concrete Wall Boxes



Kwikon® Single Gang Concrete Wall Boxes offer a fully assembled, PVC alternative for installing boxes in poured-in-place concrete walls.

Featuring a concrete-tight poly film covering the box opening and integral hubs, the Concrete Wall Box eliminates the time-consuming wrapping and taping work associated with traditional metal boxes. The non-metallic, non-conductive and non-corroding boxes arrive at the jobsite ready to install saving you time and money!

## ENT Support for Concrete Slab Construction



Perfect for use in high-rise, post-tensioned buildings, the new ENT Support Unit (ESU) raises the tubing or conduit up off the concrete form to maintain a level raceway during the concrete pour. With its minimal surface contact, the ESU allows for maximum aggregate flow and concrete consolidation. Constructed with an easy locking mechanism for any 1/2" to 2" sized ENT, the ESU saves installation time and labour compared to using traditional tie wire. The plastic material also eliminates corrosion on exposed surfaces.

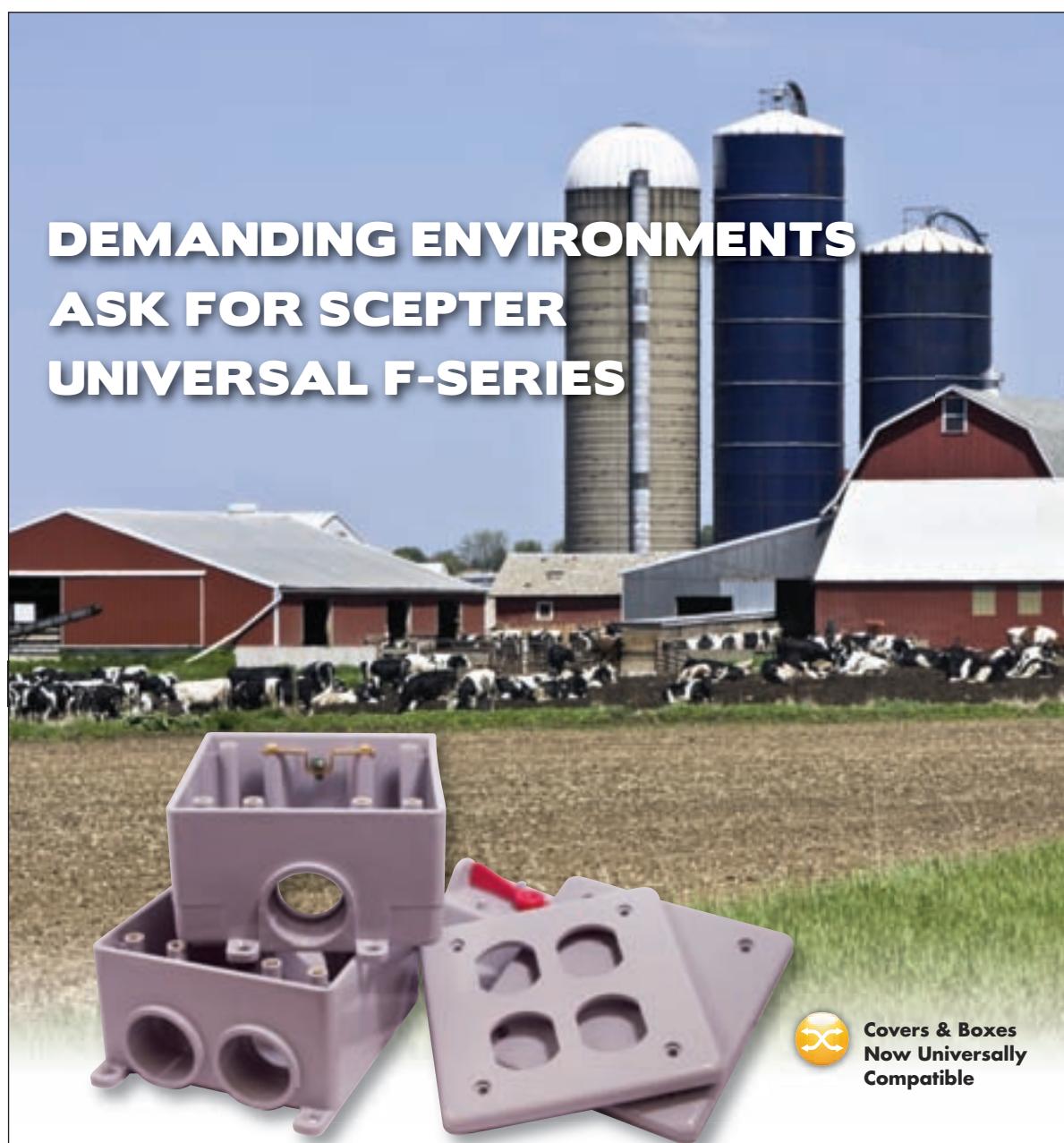
## EPR Kit Adapters make Duct repairs quick and easy!



New Adapters for our EPR Conduit Repair Kits allow contractors to repair a broken section of DB-II duct while leaving the cables inside and restoring the duct to its original form.

The pre-cut adapters easily open around existing cabling to make repairs quickly and effectively, reducing end-user downtime and complaints, and saving contractors time, labour and money.

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**Schneider single-phase 120-240V Homeline residential loadcentre**

Schneider Electric claims its new, single-phase, 120/240V Canadian Homeline residential loadcentre reduces installation time while maximizing contractor and end-user safety. Designed for the Canadian market, CSA-certified Homeline loadcentres carry a 10-year warranty and a lifetime circuit breaker warranty. Schneider says both contractor and end-



user safety concerns are addressed: a shielded current-carrying bus protects against accidental live contact, while a powder-coated paint process ensures smooth edges to protect against accidental cuts and scrapes. A standard door is included on all double-row loadcentres, and embossed circuit numbers and a large directory allow easy circuit identification.

**SCHNEIDER ELECTRIC**[www.schneider-electric.ca](http://www.schneider-electric.ca)**Milwaukee RedLithium batteries perform down to minus 18C**

Milwaukee's RedLithium batteries (which we told about back in September 2010) promise to



increase productivity while saving you time and money. The technology incorporated into Milwaukee's 3rd-generation lithium-ion battery is fully compatible with all M12 and M18 cordless products, promising 40% more run-time, 20% more power and 50% more recharge cycles. Users are instantly able to upgrade the overall performance of their existing Milwaukee tools, says the company, simply by switching to the RedLithium battery packs. The RedLithium battery can perform in temperatures as low as minus 18°C.

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**Higher weight ratings for Arlington's FBRS4200R adjustable bracket fan/fixture box**

Arlington Industries' FBRS4200R heavy-duty, plated steel box with adjustable bracket now has higher weight ratings for fans and fixtures installed in retrofit (existing) construction. The box is rated for a 150-lb fixture or a 70-lb fan when installed on joists spaced 16" on-center; and 70 lbs for either a fixture or fan on joists spaced 24" on-center, says Arlington. The 20.0 cubic inch box installs between rafters with 16" to 24" on-center spacing, and bracket ends bite into the wood rafter or joist to hold the fan or fixture in place. The product is UL/CSA Listed.

**ARLINGTON INDUSTRIES**  
[www.aifittings.com](http://www.aifittings.com)**Lind LE9000, LE9500 and LE6500 cord reels**

Lind Equipment proudly introduces its new line of heavy-duty and weatherproof cord reels, in which the heavy-duty cord reels "offer a durable all-steel construction at a reasonable price point" and the weatherproof cord reels come in both heavy-duty all-steel models and an industry-first industrial-duty NEMA 4X weatherproof reel, it says. LE9000 series reels are available in models with up to 50-ft of cable and up to 4 conductors, while the LE9500 series is available with up to 80' of cable and up to 12 conductors. The LE6500 reels are best suited for wet areas that require portable power, says Lind.

**LIND EQUIPMENT**  
[www.lindequipment.net](http://www.lindequipment.net)

**ADVERTISER INDEX**

ADVERTISER.....	PAGE
ABB .....	25
Arlington Industries Inc .....	23
Britech Corp. ....	33
CodeSafety.....	33
Copper Wire .....	33
Falvo Electrical Supply Ltd.....	33
Flir.....	10
Fluke .....	33
Hammond Manufacturing .....	30
Hubbell Wiring.....	12
Ideal Supply Company Ltd .....	18
IED Limited Partnership.....	36
IPEX Inc .....	14,15,31
Lapp Canada .....	6
Lind Equipment .....	27
Mercedes-Benz.....	19
Mersen Inc .....	9
Milwaukee Electric Tool .....	29
Nexans Canada .....	1
Northern Cables.....	7
Ontario Power Authority .....	8
Rittal Systems Ltd .....	32
Schneider Electric .....	20,21
Southwire.....	35
Standard Products.....	2
Surge Pure .....	13
Thomas & Betts .....	1,5,11
United Wire .....	4

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# Electric surface heating systems

Sometimes, when snow collects on a building's roof, melted water can get in under the shingles. This is usually caused by inadequate ceiling insulation or roof ventilation, and the roof surface over the building gets warm enough to melt the snow there. The water then flows into the eaves trough where it refreezes because the area under the overhang is not heated. This refreezing can create a layer of ice that will eventually result in water migrating under the roof shingles. This action triggers damage and mould inside the building.

A solution to this problem is to install heating cables on the roof edge, in the eave troughs and the downspouts. Canadian Electrical Code (CEC) Rules 62-302 to 62-316 apply to fixed surface heating systems used for melting of snow or ice on roofs.

Special consideration should be given to Rule 62-300(4) requiring that ground fault protection shall be provided to deenergize all normally ungrounded conductors of electric heating cable/panel sets, with a ground fault setting sufficient to allow normal operation

of the heater. This could be a Class A ground fault circuit interrupter, but these are designed to trip the circuit breaker when the ground fault current exceeds 6 mA.

Nuisance tripping can occur due to this 6 mA setting, especially when the heating cable can easily be over 100-metres long. To avoid nuisance tripping, it is essential to review the different ground fault protection options available and select the right device. There are many different products on the market that provide ground fault circuit equipment protection set at 30 mA.

Rule 62-124 Field splicing, modification or assembly of series heating sets should be done by trained personnel. Following the manufacturer's instructions is critical to satisfactory performance of the system, especially when connecting the heater cable to the power source, terminating the tail end of the cable or splicing the cable, and locating those splices.

Rule 62-308 Heating cable sets installed on or wrapped around surfaces requires that those heating cable be secured in place by

suitable fastening devices that will not damage the heating unit, and are suitable for the temperature involved. Using substitutes such as U-clips instead of manufacturer approved roof clips and downspout hangers is a CEC rule violation that can lead to electric shock and fire hazards.

Rule 62-308 (3) requires the metal braid or sheath of each heating cable set be bonded to ground.

Rule 62-310 Parallel heating cable sets requires these cable sets to be assembled and installed in accordance with the manufacturer's instructions.

Rule 2-024 Use of approved equipment requires electrical equipment used in electrical installations within the jurisdiction of the inspection department to be approved and be of a kind or type and rating approved for the specific purpose for which it is to be employed. Rule 62-400 references a table in Appendix B that provides information on required usage markings to ensure correct installation taking into account weather resistance, wet location applications and wet location under pressure applications.

To have a safe, reliable and well performing installation, the installer needs to follow the CEC rules and the manufacturer's installation procedures. **EB**

**Questions and answers compiled by the Electrical Safety Authority | VISIT [WWW.ESASAFE.COM](http://WWW.ESASAFE.COM)**

## Tackle The Code Conundrum... if you dare

Answers to this month's questions in August's Electrical Business.

## How did you do with the last quiz? Are you a...

**Master Electrician ? (3 of 3)**  
**J Journeyman ? (2 of 3)**  
**Apprentice ? (1 of 3)**  
**Plumber ?! (0 of 3)**

### Question 1

Where receptacles of type 14-50R are installed on recreational vehicle lots, the CEC requires them to be protected by GFCI of Class A type.

- a) True
- b) False

### Question 2

Does the CEC allow the usage of non-metallic sheathed cable in a building of combustible construction?

- a) True
- b) False

### Question 3

For receptacles having CSA configurations 5-15R or 5-20R installed in buildings under construction, they:

- a) shall be protected by GFCI Class A
- b) can be wired by NMSC according to Rules 12-500 to 12-526
- c) shall be kept entirely separate from lighting branch circuits
- d) all of the above

### Answers to Code Conundrum EBMag May 2011

**Q-1:** The metal assembly of a raised floor in a computer room must be bonded with a conductor [ \_\_\_\_ ] copper to form an effective equipotential plan.

**c) #6 AWG.** Subrule 10-406(6).

**Q-2:** Does the CEC allow you to have two supply services of the same characteristics to enter a building when only one will be used for supplying a fire pump?

**a) Yes.** Subrule 6-102(1).

**Q-3:** When a 2 conductor NMS cable is used for a switch loop, does the CEC require you to tape the white wire with black tape at the switch (when the connections are made so that the actual black wire is the return conductor from the switch to the outlet)?

**b) No.** Subrule 4-034(2).

**Always consult the electrical inspection authority in your province/territory for more specific interpretations.**



There is a ton of news and updates at the newly renovated **EBMag.com**. And be sure to follow our Tweets on Twitter ([twitter.com/ebmag](http://twitter.com/ebmag)) to find out whenever there's something new on our website.





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