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NOVEMBER 2015



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- 5 steps for managing your fleet's energy budget
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## The fight for payment and market share

While at the national annual meeting of the Canadian Electrical Contractors Association (CECA) a short while back, I got to spend some time with the new executive director of Electrical Contractors Association of Ontario, Jeff Koller, who recently replaced Eryl Roberts.

He had been *in office* a very short time when we chatted, but he nevertheless had his finger on the pulse of the organization and its priorities.

Koller explained the single biggest issue is getting Prompt Payment legislation in place for ECAO's member contractors: "The concept in proposed legislation is simple: pay for completed construction work within 30 days of it being completed".

He went on to say: "We had proposed legislation in front of the Ontario Legislature last year that had all-party support through Second Reading, and I'm stunned... first, by the fact that it isn't now law and, second, by the response of some of the groups who opposed it—municipalities and school boards who said they couldn't possibly be expected to pay their bills within a month of the work being completed".

Apparently, prompt payment would drive up the cost of public sector construction work i.e. cost to the taxpayer. Meantime, Koller argues, "What drives up the cost is trade contractors having to factor in the risk of not getting paid for three or four months into their bid".

EBMag has been reporting on Prompt Payment Ontario's efforts in print and online, and ECAO is actively engaged. "Right now, we're involved in responding to the government-ordered independent



PHOTO: A. CAPKUN

Jeff Koller

review of the Construction Lien Act," said Koller but, according to prompt payments champions, the lien act just doesn't cut it.

But there are other concerns on the horizon, Koller noted. "I would say equally as important to many of our members is

fighting the provincial government's proposed Bill 112, which would remove provisions of the Ontario Energy Board Act which restrict local distribution companies from competing directly with our members in non-regulated markets such as streetlighting."

Without the provisions that are currently in place, Koller said, "there is a huge potential that utilities will be able to compete unfairly with our members while subsidizing their work at the expense of municipal ratepayers. They'll expand the monopolies that they already have".

From a labour relations perspective, "it's a priority to try and get a better deal for our members with our labour partners... one that's fair and equitable for both sides," Koller said, adding "If our members are able to win bids, our IBEW partners can send more of their members to work." **EB**

*Anthony Capkun*

"There is a huge potential that utilities will be able to compete unfairly with our members..."



PHOTO R. FRANCOEUR

### On the Cover and Page 8

#### Necessity (and opportunity!) is the mother of invention

Stan Rose and Marijan Rozman—the Canadian inventors behind Stanz Pedestals and EZ-clip, respectively, —both describe themselves as handy guys... always on the go. So it wasn't out of character for them to take to their toolsheds and garages when they came across a need for products that didn't yet exist... but should.

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### 10 Home sweet *connected home*

We continue to explore technologies, products and systems for the discerning homeowner... where cost is not an issue! This month we switch gears slightly and take you on a tour of Connected+, a conference and expo held recently that explores everything making waves in home automation and beyond. The Jetsons would be proud.

### 14 5 steps for managing your fleet's energy budget

Because a typical vocational fleet spends a large portion of its total operating budget on energy/fuel, fleet managers are always looking for ways to reduce energy costs. There are really only two methods for achieving this: consuming less of the energy you are currently using, and switching to a lower-cost energy source. While this sounds cut and dried, the actual implementation can be very complex due to the nearly limitless configurations and designed mission capabilities of work trucks.



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**AD member sales up 4% to \$16.7 billion in Q2**

Sales for Affiliated Distributors (AD, [www.adhq.com](http://www.adhq.com)) members grew by 4% in Q2 of 2015 to \$16.7 billion, AD reports.

“Our industry executives and member-led divisional boards are working hard to provide growth opportunities for our members through new initiatives such as e-commerce, HR professional services,



as well as conversions, marketing and incentive programs,” said Bill Weisberg, AD’s chairman and CEO. “We are also actively recruiting growth-oriented distributors and best-

in-class suppliers to join the organization.”  
By division, AD member second quarter sales grew as follows: Canadian Electrical up 11%; Industrial up 1%; HVAC up 7%; and Building Materials up 11% year over year.

# Electrical Business

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**SaskPower and BHP Billiton to accelerate CCS development**



BHP Billiton and SaskPower (www.bhpbilliton.com and www.saskpower.com) are partnering to accelerate the global development of carbon capture and storage (CCS) technology by sharing access to the data, information and lessons learned from SaskPower's Boundary Dam facility—the world's first full chain power sector CCS project.

Under their Memorandum of Understanding (and subject to contractual terms), BHP would contribute to the establishment of a global knowledge centre to help promote research and reduce the cost and risk associated with new CCS projects.

By making relevant information from Boundary Dam (www.saskpowerccs.com) more widely available, "we hope our contribution has a multiplier effect and promotes CCS investment around the world", noted Dean Dalla Valle, BHP chief commercial officer.

**Powerline Plus fined \$80k after workers suffer burns**

Powerline Plus Ltd.—an overhead and underground utility contractor—has pleaded guilty and been fined \$80,000 after two workers suffered burns while working on electrical equipment that had not been properly shut off.

According to Ontario's Ministry of Labour, Powerline was under contract to Toronto Hydro when workers arrived at a condominium building in February 2014 to continue with ongoing underground electrical work. Two workers were

instructed by their supervisor to enter an electrical vault to begin preparing termination of conductors that had been pulled into the vault.

The vault contained various energized electrical equipment including step-down transformers and switchgear. The handle on one of the switchgear was in an open position with a blue tag attached indicating that there was work being conducted on the unit. Neither worker was aware that the switchgear remained energized.

As the workers began work, there was an arc flash and both workers received second- and first-degree burns; one of them also received third-degree burns.

Powerline Plus failed as an employer to ensure that the measures and procedures prescribed by law were carried out, contrary to the Occupational Health and Safety Act. In addition to the \$80,000 fine, the court imposed a 25% victim fine surcharge, which is credited to a provincial government fund to assist victims of crime.

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**Paul Wolf and Standard Products honoured at IMARK Canada meeting**

PHOTO COURTESY IMARK CANADA.



(Left to right) Bob Smith (IMARK) with Standard Product's Jason Prevost and Eric Gravelle.

IMARK Canada ([www.imarkcanada.com](http://www.imarkcanada.com)) member distributors and suppliers recently held their annual general meeting in Toronto where IMARK Group president & CEO Bob Smith announced the winners of the Member of the Year and Supplier of the Year awards.

Congratulations to Paul Wolf ([paulwolf.com](http://paulwolf.com)), earning Member of the Year based on criteria related to their participation and purchase growth with IMARK Canada suppliers; and to Standard Products Inc. ([www.standardpro.com](http://www.standardpro.com)), which earned the Supplier of the Year award based on criteria related to their participation and sales growth with IMARK Canada members.

Also during the meeting, executives from 18 manufacturers in Canada took part in the IMARK Canada Product Stampede.

First place went to Visioneering presenters Mark Banducci and Bruce Ramsay, who discussed the company's LHBC LED fixture product line. Juno Lighting Group, featuring Darrin Hoyle and the company's LB LED troffer luminaire line, came in second. And Standard Products, featuring Jason Prevost who presented the FlexLed product line, scored third.

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**Lumen celebrates opening of Laval central distribution centre**

Electrical distributor Lumen (a division of Sonepar Canada) recently held a grand opening of its new central distribution centre in Laval, Que. Customers, vendors and employees from across the province were invited to celebrate.

The building contains a warehouse occupying 305,000 sf with an additional 80,000 sf of office space. Opening the facility with an official ribbon-cutting ceremony were: Serge Leblanc, president of Lumen ([www.lumen.ca](http://www.lumen.ca)); Francois Anquetil, president of Sonepar Canada ([soneparcanada.com](http://soneparcanada.com)); and Marc Demers, Mayor of Laval.

Lumen says the centre has designated areas dedicated to pipes, wires & cables and more; work flow capabilities are improved by the size and efficiency of the conveyor system and receiving area.



Serge Leblanc, Marc Demers and Francois Anquetil.

PHOTO COURTESY SONEPAR CANADA.

**Judge upholds OSHA powerline citations in Valley Stream**

In the U.S., a judge has upheld OSHA citations and \$181,000 penalties for contractors whose employees worked near energized powerlines on Long Island.

The U.S. Department of Labor's Occupational Safety and Health Administration cited the two employers in June 2013 for a variety of hazardous conditions at a construction worksite located in Valley Stream, N.Y. These included wilful violations for, among other things, electrocution hazards for employees performing masonry and crane work in proximity to energized 13,200V overhead powerlines.

The companies (Masonry Services Inc. dba MSI/North Eastern Precast LLC) contested their citations to the independent Occupational Safety and Health Review Commission; a hearing was held before administrative law judge Keith E. Bell in October 2014.

Bell has issued a decision affirming all citations and ordering the companies to pay a total of \$181,280 in penalties.

(Vordonia Contracting and Supplies, the project's general contractor, was cited for similar hazards but settled its case in 2014, agreeing to pay \$110,000 in fines.)

**Bridgeport pays \$2.34 million for contempt of Arlington's injunction**

Bridgeport Fittings has paid Arlington Industries \$2.34 million in sanctions for violating an injunction that prohibited any sales of Bridgeport's infringing 38ASP and 380SP Whipper-Snap connectors, announced Arlington. The sanctions order required Bridgeport to pay Arlington about \$500,000 for its lost profits and \$1.84 million for its attorneys' fees and expenses.

In addition to the monetary sanctions, the court also entered an injunction banning Bridgeport's infringing 38ASP and 380SP Whipper-Snap connectors from the market. The contempt sanctions and injunction were recently affirmed by the U.S. Court of Appeals for the Federal Circuit, Arlington added.

This contempt finding is Arlington's latest win in its ongoing battle to stop Bridgeport from copying Arlington's patented products, the company says.

To date, Bridgeport has been ordered to pay Arlington \$8.75 million based on its infringement of Arlington's patents, including the Snap-Tite and Snap2It patents. Arlington says it is currently seeking an additional \$4 million from Bridgeport.

**CAF picks NETCO as theme partner for national conference**

The Canadian Apprenticeship Forum (CAF-FCA) has a "theme partner" for its next national conference, taking place June 5-7, 2016, in Vancouver, B.C. The National Electrical Trade Council (NETCO)—an industry-funded, non-profit organization that says it provides national leadership on workforce development linked to Red Seal electrical trades—will be the lead sponsor at the biennial event, geared to connecting Canada's apprenticeship stakeholders.

"Given the important role the electrical sector plays in apprenticeship training, and NETCO's commitment to skills development in that sector, we are thrilled they have agreed to be our theme partner", said Sarah Watts-Rynard, executive director at CAF-FCA.

"NETCO is pleased to announce that our 2016 board of directors meeting (June 3, 2016) and 2016 Training Conference (June 4, 2016) will be held in conjunction with the CAF-FCA conference," added Bill Daniels, NETCO president.

"This year, NETCO made significant progress in fast-tracking a Blended Learning Action Plan that leverages leading-edge technology to combine face-to-face and online learning for electrical apprentices, journeypersons and contractors," said Dave Mason, NETCO treasurer and CECA president. "We are looking forward to sharing best practices with the broader apprenticeship community at the CAF-FCA conference."



Christina Nardiello

While at the CECA 2015 National Industry Conference in New Brunswick, EBMag met the new executive director of the **Electrical Contractors Association of New Brunswick** (eca.nb.ca)—**Christina Nardiello**—replacing the retired **David**

**Ellis**. Nardiello explains she has spent the “better part of a decade” working with the Mechanical Contractors Association of Ontario, and that her passion for the construction industry continues to grow. “This is an exciting time for us,” she adds, noting a newly updated website and the fact that ECANB is now a registered and approved provider of CSA courses to both member and non-member firms.



Deborah Taylor

**Electrical Business Magazine** is pleased to welcome **Deborah Taylor** to the team as our new account manager, reporting to **EBMag’s** publisher **John MacPherson**. Taylor has worked in the building industry and in residential home security in both Canada and the U.S. From 2006-2013 she was an account manager with the Toronto Star and, before joining **EBMag**, worked as an independent contractor for various B2C magazines. Contact her at (905) 726-4664 or dtaylor@annexweb.com.



PHOTO COURTESY ECAO.

Dan Lancia (left) accepts the Douglas J.B. Wright Award from ECAO 1st VP Mark Lloyd

**Dan Lancia** of **Holaco Installations Ltd.** (www.holaco.ca)—current president of **Electrical Contractors Association of Ontario** (ECAO, www.ecao.org)—was awarded the **Douglas J.B. Wright Award** (the association’s highest honour). Congratulations! ECAO explains the award “pays tribute to individuals who best exemplify the dedication and commitment to the electrical contracting industry as exhibited by Doug Wright through his years of service”. ECAO says Lancia has been active with ECA of Hamilton since 1996, serving as its VP from 2000 to 2002 and president from 2002 to 2008.

Congratulations to **Peter Gregg**, president & CEO of **Enersource Corp.** (www.enersource.com), for being named the industry’s **Leader of the Year** by the **Ontario Energy Association** (www.energyontario.ca). Gregg’s staff nominated him for the award, highlighting his achievements since joining the company in 2014, such as increasing employee engagement, expanding corporate representation on industry boards and associations, and introducing new external communications.



PHOTO A. CAPKUN

Jeff Koller

Association of Ontario (ISCA).

**Jeff Koller** has replaced Eryl Roberts as the new executive director of the **Electrical Contractors Association of Ontario** (ECAO, www.ecao.org). Koller most recently served with the Interior Systems Contractors Association of Ontario (ISCA).



James McGill

**James McGill** is now president of **Eaton’s Electrical Sector** (www.eaton.com) for the Americas region. McGill will report to **Revathi Advaiti**, who is Eaton’s new chief operating officer of the same sector. McGill has

headed the Electrical Products Group since December 2012 and was previously president of the Asia Pacific region for the Electrical Sector. He joined Eaton in 1994 and began his professional career with Westinghouse Electric in 1977.

PHOTO A. CAPKUN



John Ward

**John Ward** has joined **BRK Canada** (Dicon Global Inc.) as director of sales, where he is responsible for overseeing a network of reps across Canada in the electrical channel. BRK Canada is a manufacturer of products providing fire

and carbon monoxide protection. Ward is also involved in conducting seminars to fire departments and building officials. He joins BRK from Kidde Canada Inc.



John Sencich

**John Sencich** is now the local division manager for the **ABB’s** low-voltage products division in Canada, which includes the **Thomas & Betts** (LPCW) business. He will report to **Brian Herington**, the regional division head of

ABB Americas. Currently vice-president of Utility and other markets, Sencich joined Thomas & Betts (www.tnb.ca) in 1996 with the acquisition of Pilgrim Electrical Products.



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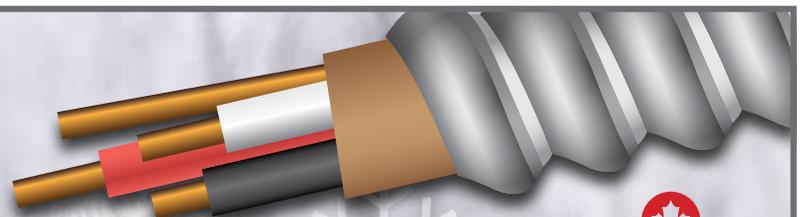
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# Necessity (and opportunity!)

## The Canadian inventors behind Stanz Pedestals and EZ-clip

### Make your wiring run a Home Run with EZ-clip

Having worked in the industry for over 20 years, Fortica Electric's Marijan Rozman says he understands the "pain and frustration" that comes with the limitations of standard protector plates, which is why he invented the patent-pending EZ-clip. The Canadian-made product can be used on all types of metal studs, as one size fits all, and no screws are required. Made from galvanized metal, EZ-clip protects your wiring run from pesky drywall screws. To install, simply hook EZ-clip to the inside of the stud, then push it forward until it locks.

**EZ CLIP**  
marijanr@rogers.com



PHOTO R. FRANCOEUR

EZ-clip as seen in the pages of Electrical Business Magazine

Invented by Marijan Rozman of Fortica Electric, the patent-pending EZ-clip is a one-size-fits-all solution.

Renée Francoeur

**S**tan Rose and Marijan Rozman both describe themselves as handy guys... always on the go. So it wasn't out of character for them to take to their toolsheds and garages when they came across a need for products that didn't yet exist... but should.

When you have an idea, sometimes you have to just run with it and see where it takes you, says Rose, a construction superintendent in Central Alberta.

Rozman echoes his sentiments, noting, "What do I have to lose? Might as well try".

"When I was younger, I was always a handy kid. You know... give me a hammer, and I was building something," says Rozman, 47, of Fortica Electric in Mississauga, Ont. It's one of the reasons he chose a career as an electrician—he likes working with his hands.

Rose, 69, was the same way growing up, and continuously keeps an eye out on his jobsites for things he can improve.

Both Rose and Rozman have taken their inventions—Stanz Pedestals and the EZ-clip, respectively—to new business heights, both of which were borne out of jobsite frustration.

### Enough is enough

About six years ago, Rose was building a warehouse in Edmonton. By the time the project wrapped up, he had to replace nine damaged parking lot pedestals (for plugging in vehicles) on the site.

"That was due to paving, landscapers, bobcats, loaders, what have you, knocking them, bending them over. And who pays for them? I'm on the hook because I can't turn the building over to the client with nine twisted pedestals," Rose says. "I thought to myself, 'OK, just how strong do we have to make these things?'. [But] the stronger they're made, something bigger and stronger will just come along and wreck them regardless."

His mind then drifted toward working with the problem instead of digging in his heels trying to stop it. "I thought, 'Well, what if they just get hit and then stand right back up?' And as soon as I went there, Bingo!"

Likewise, after losing too many screws and cursing the amount of

"When I was younger, I was always a handy kid. You know... give me a hammer, and I was building something..."

— Marijan Rozman

room around studs on standard protector plates, Rozman decided enough was enough (he'd been working with them for his 24 years in the industry). He wanted something that didn't cost him time and money... something that snapped into place. So, using existing protector plates at first, Rozman fashioned the EZ-clip to protect wiring from drywall screws. Made from galvanized metal, the EZ-clip hooks to the inside of any stud (a one-size-fits-all solution). Users

then push it forward until it locks. No screws required.

### Can't do it alone

Rose and Rozman both stashed their ideas away for a few years before reaching out to partners to help them create real prototypes.

Rozman took the leap of faith after employees and clients began to talk about his clips more and more. He found Bert Wilson of Wilson Tool & Die Inc. in Mississauga, who helped him mould an official prototype. (Wilson manufactures the EZ-clip to this day.)

"I was lucky because he didn't charge me for the die—just labour and materials—because he believed in the product, so I really admire him," Rozman says, who met Wilson through a mutual colleague. "That's how it all really began... with Bert. I believe in karma and, if you're good to people, good things happen to you."

It took Rozman "maybe eight to nine months from drawing it up to getting the first real prototype", adding that he worked a little at it every day.

Rose, meantime, returned to his pedestal solution about three years ago when he was overseeing work at a new shopping centre development.

"We were putting pedestals in and they were going to be vulnerable again, so I thought I'd make up a prototype and see if I could get something to work. So off I went to piss around with my welder at home," Rose says.

After forming a base, he researched various springs and had assembled a piece over the course of one weekend.

The model was still "kind of hokey", so Rose teamed up with Rick

# is the mother of invention



Stanz Pedestal as seen online at EBMag.com

March 22, 2013 - While at Alberta Electrical League's (AEL) Learning Expo in Lethbridge, EBMag stumbled upon the heavy-duty Stanz Pedestal, which aims to revolutionize the way we look at plug-in pedestals for our vehicles. (CHECK OUT VIDEO below.) It is constructed with a steel base plate, light-wind spring and 2-in. stand pipe, topped with a cast aluminum head for the installation of the electrical outlets. The base plate has a 2-in. hole in the centre to allow for electrical wiring. The three steel components are welded together with the aluminum head threaded on top. The unit is sand-blasted and powder-coated with a 4.5-7mm high-gloss finish. In the standing position, with the proper electrical components installed, the unit is weatherproof and will withstand freeze/thaw cycles. Most importantly, it will withstand the typical low- to medium-force impact inflicted by a car, then return to the upright position with little to no damage to itself or the source of the impact. The pedestal comes standard with a 8 x 8-in. base plate with 4 5/8-in. mounting holes in a 6 x 6-in. pattern; this base plate can be modified to accommodate existing mounting systems and styles. The height can be modified to suit individual requests. The heads are available in single or double duplex outlets. The Stanz pedestal was invented, patented, designed and manufactured in Alberta.

Stan Rose shows off the Stanz pedestal, which was borne out of the frustration of having to replace all-too-easily damaged standard parking lot pedestals.

the Welder to develop a better baseplate that complemented the spring and provided the right resistance. The unit withstood the typical low- to medium-force impact from most vehicles, and returned to the upright position as intended, with little to no damage to itself or the source of the impact, Rose says.

Rose's wife, Geralyn, took one look at that prototype and told her husband to get it patented—no matter the cost.

Sure enough, their patent lawyer couldn't find any similar products in North America, and told the Roses they had a "home run".

"The lawyer said to us he couldn't believe we've been plugging in vehicles for over 50 years and nobody had thought of it," Rose says.

## Getting to the masses

In March 2013, Stanz Pedestals (stanzpedestal.com) made its debut at an Alberta Electrical League event in Lethbridge. They've sold hundreds of units since then through electrical wholesalers (MSRP around \$250) and the volume is increasing every month, Rose says.

The pedestals are manufactured in Alberta with fellow local companies Cornell Custom Fabricating and Go Powder, and several hundred units are kept in inventory at all times, Rose says. Stanz Pedestals can now be found in Anchorage, Alaska, across Montana and North Dakota, as well as Western Canada.

Rose had a video and website set up for the product, and hopes to see more growth in the coming years.

"That's been the biggest challenge: marketing them [and] getting the word out," he says. Rozman is on the same page.

For now Rozman stores his clips in his own garage, producing about 2000 a month on average, and doing all the packaging and labelling himself. Most of his buyers are from in and around the Greater Toronto Area who had heard about EZ-clip through word-of-mouth, he says.

While trying to market it on his own, he just wasn't seeing the results he'd hoped for so for the past seven months, EZ-clip (which sells for 30 cents a piece) has been marketed with Rack-A-Tiers, a B.C. company

"I never even remotely thought I'd be an inventor or own a patent one day."  
— Stan Rose

founded by electricians that designs and distributes specialty electrical tools.

"This is a better way to get EZ display models to distributors and out to tradeshow all across Canada," Rozman says. "People who see it, I feel they really see the benefit."

## Rights locked down

While the EZ-clip is still patent-pending, the Roses have the Red Ribbon documents stating Stanz Pedestals is fully patented and trademarked in the United States. They are still waiting on the hard copies from their Canadian patent.

Of the patent process, Rose says it was "horrendously expensive, but worth it".

"We're completely financing it ourselves... I'd say if you're going that way [patenting], you'd need at least \$50,000 to play with," Rose says. "Honestly, I'm just blessed it fell in my lap."

Rozman adds it took quite a while to obtain CSA-approvals for Canada and the States but that he's glad to have it done.

## Once an inventor, always an inventor

Flexibility is key when inventing something new, Rozman notes.

"There's always going to be little changes you have to be willing to [do] to make your product the best... For me, it was the little hooks [on the clip]. I played around with them so electricians can adjust them and bend them to get more 'grab'."

The EZ-clip isn't Rozman's first taste of invention. He was on the show Dragons' Den a couple years ago for a drywall dolly design he'd hatched, and he has also tinkered with his own take on EMT clips for pipes on unistrut. "Who knows what I'll do next?"

Similarly, parking pedestals are just the beginning for Rose. He is curious to see how the product can be adapted into things like the steel bollards found around gas lines, and even in airport applications.

"I never even remotely thought I'd be an inventor or own a patent one day," Rose says. "Thank God for a wife who's watched me create a bunch of silly little things over the years, and for believing in me." **EB**

# Home sweet *connected* home



PHOTO COURTESY CONTROL4.

The HC-800 from Control4 has integrated wireless and ZigBee with external antennas and optional 3-metre extended antenna.

## Connected+ takes you inside the hooked-up home

Renée Francoeur

The Jetsons would be proud. Thanks to IoT (Internet of Things), we're at the point where we can have our home programmed to turn on lights at designated times, raise/lower the blinds according to the sun, heat or cool to a specific degree, and even have the coffee maker brew a pot with the morning alarm.

Berg Insights predicts there will be 36 million smart homes in the United States and Europe by 2017, while Navigant Research reports it expects worldwide revenue from home energy management systems to grow from \$512 million in 2013 to \$2.8 billion in 2020.

So what is smart home, anyway? According to Len Diplock, vice-president of corporate development with Direct Energy, it is a home in which the technology contained therein knows "what we need before we do".

But some don't think we're quite there yet. "We're in the era of the connected home," says Aditya Pendyala, co-founder and head of products at MNUBO, a company that analyzes IoT data. "We have to be honest; they're not *smart* homes... not yet."

Be they smart or connected, we have entered the age of the next-generation home in which products and systems are connected via a web portal and/or app, and can anticipate and respond to the needs of the occupants.



PHOTO COURTESY SOMFY.

Somfy's myLink plugs into any outlet and communicates with the home Wi-Fi network to control Radio Technology Somfy products.

This was the theme at the second annual Connected+ conference and exhibition at the MaRS Discovery District in Toronto. The event took a deeper look at IoT and its related smart home technologies, as well as the latest in connected consumer devices. Here's an overview of some of the hot topics and new automation products showcased at the event.

### Continuous communication

According to an August 2015 survey by International Data Corp. (IDC), the top five brands for home automation devices (ones already owned) are Nest (15%), Samsung (14%), Logitech (11%), Honeywell (10%) and LG (10%). However, as the product range expands from thermostats and security to things like TVs and automated beer fridges, consumers want the assurance of interoperability between brands, devices and technologies.

The smart home industry is at a tipping point, says Pendyala and, in addition to the need for personalization and data-driven services, there must also be a "seamless experience". This means the dishwasher must be able to communicate with the entertainment system's volume control, which should exchange data with the HVAC and lighting system when, for example, someone is watching a movie.

Device harmonization efforts in the works include the Open Interconnect Consortium, AllSeen Alliance and the Thread Group.

### Zero user interface

The touchscreen—as a user interface—is becoming passé. According to Ohad Zeira, Verizon’s director of IoT, the next big thing is Zero User Interface (UI), which moves away from the touchscreen approach to something more natural, like interacting with devices via voice command or haptics (interactions involving touch).

Interfaces will become more automatic and tap into behavioural data in the future, he adds, much like the thermostat Nest, which learns what users want based on their interactions with it.

IoT is “living services”, Zeira says, quoting a term coined by Andy Goodman, group director of Fjord’s Design Strategy.

“It’s not just things connected together... it’s people, environments, vehicles. It’s an orchestration of all these different things together and, to us, that means it’s a living service; a service that can adapt and modify in real-time to what an individual user might want,” Goodman says.

### Crucial hubs

The smart home started with Wi-Fi routers and wireless printers, according to Tal Schierau of Radialpoint, a Montreal company that builds technology specifically for tech support. Today, it can be a dog’s breakfast of various products, so having a main hub or controller is crucial.

Control4 boasts two controllers: the HC-800 (suitable for the entire house) and the HC-250 (for smaller or single-room systems, or as a universal remote for every TV in the house). The HC-800 features a dual-core 1.8GHz processor and out-of box software capability that includes TuneIn (online radio) as well as Control4 app and video/audio intercom licensing. It also has integrated wireless and ZigBee with external antennas and optional 3-metre extended antenna.

Plug-and-play is the key theme in home automation for Owon, the manufacturer behind HASS 6000—a wireless home automation and security system. It consists of a ZigBee gateway, which you plug in; then, it integrates with the home area network while connecting to mobile devices directly or via a cloud server. This gateway can control elements such as video surveillance, smoke alarms, motion detectors, thermostats, plugs and dimmers.

This means customers can expand their system over time instead of making a one-time investment, says Owon’s Derek Gariepy.

### Biometrics... even for wine cellars

Security still reigns when it comes to the smart home, says Greg Roberts from iControl Networks. “Our research revealed that 90% of consumers say personal and family security remain one of the top reasons to purchase a smart home system.”

Biometrics in home automation and security

is starting to pick up speed, in part thanks to the iPhone 5’s fingerprint sensor option, says Shiraz Kapadia, CEO and president of Invixium.

He notes biometrics was largely associated with security, but Invixium is showing it also has a place in making a space convenient. The IXM Touch is the company’s high-end fingerprint device, complete with an ARM Cortex A8-720 MHz processor and Corning Gorilla glass. It is certified to work with a Control4 controller to integrate with other smart home features.

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Owon shows off its HASS 6000—a wireless home automation and security system at Connected+.



A slide from Invixium's presentation at Connected+ illustrates the shift from simple to smart in the home environment.



Simon Nazaretian with Invixium explains the high-end IXM Touch fingerprint device.



Aditya Pendyala, co-founder and head of products at MNUBO, explains data collection in smart homes to audiences at Connected+.

With a MSRP of \$900 to \$2000, Invixium's devices are not just for the front door. They have been used to limit access to the family pool, home office and even the wine cellar (here, the device can connect to a lighting system that helps you find the wine you seek).

When away, friends can get access to the Invixium-protected home with a passcode sent to them remotely by the homeowner.

Biometrics allow homeowners to personalize, which is a big factor in what makes a smart home desirable, Kapadia says.

### Shades and lighting

Smart shades are also making it easier to control home comfort with the tap of a finger. Somfy manufactures motors and control systems for

interior shades and blinds, as well as protection screens. All it takes is the myLink hub (\$200 to \$250) that plugs into any outlet and communicates with the home Wi-Fi network to control Radio Technology Somfy products. MyLink can be programmed via a smartphone or tablet to raise and lower shades at certain times or with the sun's cycles.

### Limited only by imagination

While Connected+ showcased brand new products and presented timely topics, it's important to remember that smart homes are a constantly evolving landscape, Pendyala says. "We spend 23 days a year on our phones but we spend 219 days a year in our homes... The potential is definitely there." **EB**

## WIRELESS IS REDEFINING HOME AUDIO MARKET

The popularity of mobile devices and changing consumer habits in media consumption are not only increasing demand for wirelessly connected audio devices, but also altering the home audio landscape.

According to research from IHS Technology, annual shipments of connected audio products—including wireless speakers and soundbars, and connected AV receivers—are expected to grow at a compound annual growth rate (CAGR) of 88%, from 1.5 million units in 2010 to nearly 66 million units in 2018.

Within this composite group of products, connected soundbars and wireless speakers are expected to provide noteworthy growth, not just within home audio, but also within the overall consumer electronics market. Combined shipments are forecast to grow at a CAGR of 94% over the same period.

"Growing penetration of tablets and smartphones, combined with an ongoing shift in consumer media consumption preferences toward those

devices and streaming services such as Spotify, Pandora and Deezer—are collectively driving a behavioural shift in how people listen to music inside and outside their homes," said Paul Erickson, senior analyst for IHS Technology. "Consumers are seeking ways to wirelessly play audio from their mobile devices on speakers in the room they're in, in multiple rooms in a household, and on speakers carried with them while on the go. This geographically diverse need will drive strong global growth in Wi-Fi and Bluetooth-connected speakers over the next few years."

"While the whole wireless speakers category is forecast to grow rapidly, network-connected multi-room speaker systems is the small-but-growing subcategory to watch," Erickson continued.

"The decades-old traditional monolithic audio system concept is simply becoming an increasingly niche proposition, primarily for serious enthusiasts," Erickson said. "Over the next few years, wirelessly connected audio and, in particular, network-connected speakers, will render the traditional wired audio system an obsolete concept for consumers."



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STOCK PHOTO

# 5 STEPS FOR MANAGING YOUR FLEET'S ENERGY BUDGET

Christopher Lyon

**B**ecause a typical vocational fleet spends a large portion of its total operating budget on energy/fuel, fleet managers are always looking for ways to reduce energy costs. There are really only two methods for achieving this:

- consuming less of the energy you are currently using
- switching to a lower-cost energy source

While this sounds cut and dried, the actual implementation can be very complex due to the nearly limitless configurations and designed mission capabilities of work trucks.

First, most fleets have to maintain service during any conversion process. They may also have to figure out how to relocate vehicles on an emergency, short-term or permanent basis. Funding is another important consideration. Depending on how a fleet approaches energy cost reduction, it could require significant capital expenditures, one-time expense payouts, and/or ongoing supplemental maintenance and operating costs. Assuming required funding is available, the fleet manager may need to prove an acceptable ROI.

Here I will outline 5 steps you can take to determine the best ways to maximize your fleets' energy budget.

## 1. Analyze drive and duty cycles

Most of the processes and technologies for reducing fleet energy costs are sensitive to drive and duty cycles. While these terms are often used interchangeably, they are actually separate measurements of how a fleet operates. A *drive cycle* defines how vehicles operate based on factors such as:

- average speed
- amount of incidental idling time
- power export time (e.g. PTO operation)
- number of starts and stops per cycle
- longest average continuous running time per cycle

A *duty cycle* defines how much a vehicle is used, and looks at factors such as:

- length of average operating cycle
- number of operating cycles per period
- total miles driven per measurement period
- percentage of loaded versus empty operation
- percentage of on-road versus off-road operation

Because the effectiveness of energy-reduction technologies is generally closely related to a fleet's drive cycles, fleet managers can utilize drive cycle data to identify technologies that could reduce their energy budgets. They can then use duty cycle data to determine whether the projected savings associated with an alternative are adequate to cover the investment and provide the desired ROI.

Remember, a single fleet can have multiple drive and duty cycles, so one approach to energy cost reduction might not work across the board. Also, drive and duty cycles are frequently seasonally dependent, especially in areas with harsh winter weather.

For example, a fleet may have an inner-city drive cycle with low average speeds, multiple stop/start cycles and extended periods of incidental idle time. All of these factors are compatible with the use



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of an electric hybrid powertrain. However, a duty cycle analysis could show annual miles driven are so low that even doubling the current average fuel economy will not produce enough savings to cover the cost of buying the hybrid system. Since the drive cycle also documents an excessive amount of incidental idle time, a better (lower-cost) approach for this fleet may be to implement an idle management strategy.

## 2. Remember the basics

In many cases, the simplest and most economical approach to reducing energy costs is to simply consume less energy, and there are several tried-and-true steps fleets can take. The simplest techniques have been recognized for so long that they are often downplayed but, when implemented properly, can be very effective. A shortlist of these approaches includes:

- maintain proper tire inflation
- reduce vehicle weight
- reduce rolling resistance
- passive idle reduction (e.g. driver coaching, reminder signs)
- maintain vehicles properly

Going beyond these somewhat passive approaches, fleet managers can take action to make new or existing vehicles more efficient. Since the powertrains of newer vehicles are computer-controlled, fleets can often re-map the engine performance curves and transmission shift points of their trucks to improve overall powertrain efficiency. When ordering new trucks, carefully choosing and matching components to specific drive and duty cycles can produce impressive energy reductions.

## 3. Implement telematics and driver behaviour modification

There are a number of ways to improve vehicle operational efficiency. Two approaches that provide great potential are telematics and driver behaviour modification. The most familiar application of telematics in the vocational fleet environment is GPS functionality. This technology can have a direct impact on fleet operating costs by reducing miles driven.

Going beyond this aspect of telematics, the ability to track vehicle condition in real-time offers multiple possibilities for energy management. By mapping the PCM (powertrain control module) to the telematics system, fleet managers can read system fault codes, tire pressures, and so on. By using an exception reporting system, vehicles with defects are flagged so repairs can be made at the earliest opportunity. The data collected can also be used to develop drive cycle profiles and identify issues such as hard acceleration and braking, sudden radial maneuvers and engine idle time.

The driver can impact overall fuel economy by as much as 30%. The most-effective behaviour programs provide the driver with real-time performance feedback. Something as simple as instantaneous fuel economy feedback on the vehicle's dash can be effective.

## 4. Consider hybrid and electrified technologies

For vocational trucks, hybrid and electrified technologies can be effective, reducing energy costs in several ways:

- allow the engine to operate in an optimum efficiency range
- recapturing kinetic energy normally lost during braking
- capturing surplus engine energy for use at a later time (e.g. driveline or power export)
- facilitate engine idle management
- allow for the primary vehicle power source to be downsized

When employing hybrid vehicles, the selected technology should be matched to the drive and duty cycles. Many vocational trucks are driven a relatively limited number of miles per day, so the efficiencies associated with full hybrid drivetrains might not justify the cost and complexity of such systems.

This has resulted in the development of worksite hybrids, which utilize surplus engine power—stored as electric energy (sometimes supplemented by plug-in battery charging)—to operate truck-mounted equipment without having to run the primary engine. This technology is much simpler than full hybrid powertrains, but still provides substantial idle time reductions during stationary worksite operations. Idle management can be further enhanced by using the system to maintain cab heating and cooling (hotel loads).

## 5. Evaluate lower-cost energy options

Fleet managers have several lower-cost energy options, too, such as biodiesel, electricity, natural gas (CNG or LNG) and propane (autogas).

Biodiesel is generally more expensive than conventional diesel fuel; however, in some regulatory environments, it offers significant tax advantages that may result in lower total cost. In these areas, biodiesel represents a significant opportunity for fleet managers as it is basically a drop-in replacement for conventional diesel. (The primary expense associated with conversion to biodiesel is cleaning fuel storage tanks before taking delivery and changing fuel filters frequently until the biodiesel has cleaned all residue out of the vehicle tanks.)

Electricity is typically the lowest-cost alternative fuel available to fleets, and when the capabilities of an available vehicle fit the associated drive and duty cycles, operating cost savings are very attractive. But electric trucks are limited in availability and range/speed capabilities. Upfront costs can be high, as they require a fairly large capital investment and, in some cases, significant infrastructure investments for charging systems and grid-tie charges.

An alternative to pure electric trucks is the extended-range electric truck. These units employ an all-electric drivetrain with a small onboard motor genset that can provide a portion of the electric demand. This combination can offer operating ranges in excess of 250-300 miles before a full battery charge is required. There is a fine line between extended-range electric vehicles and series electric hybrids—when the onboard motor genset is large enough to provide all of the truck's power demands, it crosses over to being a hybrid.

Natural gas boasts the lowest cost among all of the alternative internal combustion engine fuels currently in use, and generates the smallest carbon footprint. These advantages are offset in some drive/duty cycle applications by both high conversion and infrastructure costs.

When a fleet has access to public natural gas fueling infrastructure, or when the quantity of fuel consumed at a given location is enough to justify the infrastructure investment required for a captive facility, natural gas has the potential to generate major energy cost savings. Compressed natural gas (CNG), currently the most commonly used variant, imposes weight and space penalties on trucks so, in many cases, it may not be feasible to convert existing trucks to use CNG. However, most of these weight and space issues can be addressed when designing new vehicles.

Also known as autogas, propane has the second-lowest carbon footprint of currently viable alternative fuels, and is priced between natural gas and gasoline. It has the advantage of requiring the lowest infrastructure costs of any of the alternative fuels (other than electricity, provided major infrastructure investments are not required). It also has a much higher energy density than CNG and is stored at a lower pressure, making the tanks lighter and cheaper. This makes it much easier to convert existing vehicles and more attractive for fleets with lower volumes per fueling facility.

### Learn more at The Work Truck Show and Green Truck Summit

All of the technologies discussed above will be addressed in detail during The Work Truck Show 2016 and concurrent Green Truck Summit, which are produced annually by NTEA, an association for the work truck industry.

The event is being held March 1-4, 2016, at the Indiana Convention Center in Indianapolis. Educational programming and the Green Truck Summit begin March 1, and exhibits open March 2. For more information, visit [worktruckshow.com](http://worktruckshow.com). 

*Christopher Lyon is a former fleet manager and currently serves as director of fleet relations for NTEA, the National Truck Equipment Association. Visit [worktruckshow.com](http://worktruckshow.com).*



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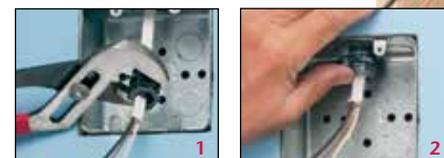
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# Safety/maintenance, NETA standards and good business

**M**ore than ever (and about time, too!), the proper maintenance of electrical equipment is getting the attention it deserves. CSA Z462 “Workplace electrical safety” has this to say:

Clause 5.2.3 - Equipment maintenance - Electrical equipment shall be maintained in accordance with manufacturers’ instructions or industry consensus standards to reduce the risk associated with failure. The equipment owner or the owner’s designated representative shall be responsible for maintenance of the electrical equipment and documentation.

Maintaining electrical equipment is good business for two reasons:

- It helps ensure the electrical safety of those in your workplace
- It keeps production going

Having an arc flash study completed using IEEE 1584 as pulled from a short circuit coordination study is almost worthless without having a comprehensive maintenance program in place executed by competent, *qualified* personnel, which could be an owner’s own crews, third-party contractors, or combinations thereof.

Within the electrical sector, the topic of *qualified* is always a major point of conversation. Defining what it means to be qualified to do electrical work within your business unit needs to be decided and documented. Getting the very best maintenance completed for the best value is key to running a safe and efficient business.

One of the very best ways to ensure maintenance is performed by competent, qualified personnel for maximum ROI is to use NETA-based electrical equipment standards as your prequalification before starting any electrical maintenance work tasks.

The InterNational Electrical Testing Association (NETA) is an association of electrical testing companies, and accreditation is not easy to attain. The application process is rigorous to ensure that every accredited company provides services to the standards of safety and reliability as specified by entities such as ASTM, CSA Group, IEEE, EASA (Electrical Apparatus Service Association), ICEA (Insulated Cable Engineers Association), NEMA (National Electrical Manufacturers Association), NFPA, and UL and ULC.

Looking at the following NETA standards a little closer reveals where ROI can be achieved:

- ANSI/NETA MTS “Standard for Maintenance Testing Specifications [MTS] for Electrical Power Equipment and Systems” (2015 ed.)
- ANSI/NETA ATS “Standard for Acceptance Testing Specifications [ATS] for Electrical Power Equipment and Systems” (2013 ed.)

- ANSI/NETA ECS “Standard for Electrical Commissioning Specifications [ECS] for Electrical Power Equipment and Systems” (2015 ed.)
- ANSI/NETA ETT “Standard for Certification of Electrical Testing Technicians [ETT]” (2015 ed.)

Rather than show you *how to test*, the MTS standard instead focuses on *what to do*. Having legitimate specs for your electrical equipment is of far greater value to workplace safety and uptime than just gathering *opinions* from your personnel or contractors.

The ATS standard will give you best practice values that can be used to measure the techniques used in the MTS standards.

Newly installed equipment should be set up properly right from Day One. Risks to safety and production are reduced significantly, and well-running equipment establishes a great baseline. The ECS standard for commissioning should be a part of any comprehensive work plan to assure value for dollars spent.

Last, but certainly not least, you must ensure those executing the work are qualified and, even better, certified. That’s where the ETT standard comes in. NETA provides four levels of technician certification, with Level 4 being the highest.

Based on the heightened requirements for maintenance excellence within electrical safety standards like CSA Z462 and CAN/ULC S801 “Standard for Electric Utility Workplace Electrical Safety for Generation, Transmission and Distribution”, NETA standards can provide both increased safety and great ROI. **EB**

*A subject-matter expert on electrical safety, Mike Doherty is the director of learning & continual improvement at Sbermco Industries Canada Inc. He is a licensed electrician and an IEEE senior member, and has served as the Technical Committee chair for CSA Z462 since its inception. His specialties include electrical safety and health & safety management, maintenance, consulting, training, auditing and electrical incident investigations. Mike can be reached at [mldoherty@sbermco.com](mailto:mldoherty@sbermco.com).*



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### IN CASE YOU MISSED IT...



**PHOTOS** • The nearly 60 female golfers who gathered at Cardinal Golf Club in King, Ont. for the 3rd Annual Electric Elle tournament couldn’t have picked a better day for it. Catch all the action at [tinyurl.com/oo7zvl](http://tinyurl.com/oo7zvl).



**PHOTOS** • It was Back to the Future at Baka Communications’ headquarters in Etobicoke, Ont. as the wireless solutions company—which says it hosts the first and largest solar plug-in canopy for electric vehicles in North America—celebrated 30 years and the unveiling of a new addition to the canopy. For more, visit [tinyurl.com/q9sa2m8](http://tinyurl.com/q9sa2m8).



**PHOTOS** • EBMag was in beautiful St. Andrews By-the-Sea, N.B., which played host to the Canadian Electrical Contractors Association (CECA) 2015 National Industry Conference. Contractor delegates from across the country were there to catch up with one another, enjoy the sights (especially those found on the Algonquin Golf Course!) and attend several informative presentations. See the photos at [tinyurl.com/ov7qft5](http://tinyurl.com/ov7qft5).

**APPRO - Canadian Power Conference**  
*Association of Power Producers of Ontario*  
**Nov. 17-18**, Toronto, Ont.  
Visit [conference.appro.org/conference2015](http://conference.appro.org/conference2015)



**The Buildings Show**  
**Dec. 2-4**, Toronto, Ont.  
Visit [www.thebuildingsshow.com](http://www.thebuildingsshow.com)



**EFC Christmas Receptions**  
*Electro-Federation Canada*  
**Dec. 2**, Toronto, Ont.  
**Dec 3**, Quebec City, Que.  
**Dec 8**, Halifax, N.S.  
**Dec 10**, Montreal, Que.  
Visit [www.electrofed.com/event](http://www.electrofed.com/event)



**Solar Canada**  
*Canadian Solar Industries Assoc.*  
**Dec. 7-8**, Toronto, Ont.  
Visit [www.cansia.ca](http://www.cansia.ca)



**EHRC's Awards of Excellence**  
*Electricity Human Resources Canada*  
**Dec. 9**, Toronto, Ont.  
Visit [electricityhr.ca](http://electricityhr.ca)



**NEMRA Annual Conference**  
*National Electrical Manufacturers Representatives Association*  
**Feb. 3-6, 2016**, Dallas, Texas  
Visit [www.nemra.org](http://www.nemra.org)

**The Work Truck Show**  
**Mar. 2, 2016**, Indianapolis  
Visit [www.ntea.com/worktruckshow](http://www.ntea.com/worktruckshow)



**LEDtronics HBL004 bay lights**

LEDtronics' UL-listed HBL004 series of low-profile bay lights comes in four fixtures, ranging from 60W to 200W for replacing 250W to 600W MH and HPS bay lights. The IP66-rated fixtures have a flexible input voltage range of 100 to 277vac. The lumens range from 6600 to 22,000.

**LEDTRONICS**  
www.ledtronics.com

**MaxLite's A-lamp in classic form factor**

MaxLite says it has given its omnidirectional LED A-lamp a makeover. Redesigned with a rounder, more traditional bulb shape, the Energy Star qualified LED A19 lamp looks just like a traditional incandescent bulb. But, unlike previous models, the heat sink is concealed by a white surface on the lower half of the lamp.

**MAXLITE**  
www.maxlite.com

**Universal expands Everline kits**

Universal Lighting Technologies says it has added a 3-lamp kit and a 347V option for the Everline LED Retrofit Kit product line. The kit serves as a fluorescent lighting replacement kit. The 2-ft or 4-ft kit consists of either 2 or (as of now) 3 LED lensed modules, one LED driver, and a harness packaged together with replacement instructions. Additionally, Universal says it is introducing a new 4500-lumen package for the 3-lamp kit.

**UNIVERSAL**  
unvlt.com

**Audacy wireless energy management system**

Ideal Industries launched a wireless energy management system targeting the retrofit, new construction,

retail and institutional lighting markets. Audacy provides wireless control via a mobile app over multi-building lighting systems by automatically sensing and adjusting to ambient light, movement and room occupancy. It integrates with existing building automation systems, provides custom control of individual fixtures and complies with ASHRAE 90.1.

**IDEAL INDUSTRIES**  
www.idealindustries.ca

**Post tops Arezzo and Varese from HessAmerica**

HessAmerica has two new post top LED luminaires: the Arezzo and Varese. With cast aluminum housing, they utilize the proprietary LEVO series light engines, developed for areas and streets where uniformity and spacing up to five mounting heights are desired. The luminaires may be specified in Type II, Type III, and Type V distributions.

**HESSAMERICA**  
www.hessamerica.com



## "eel" UltraThin

### LED Recessed Luminaire



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**The eel UltraThin LED Recessed Luminaire** really does come out on top with its wafer thin smooth design, and quick installation capability.

With no recess can need, new spaces may be created in a snap, anywhere along the ceiling by simply drilling a hole in the dry wall or tile. Sturdy spring clips, secure the UltraThin firmly in place in seconds. Providing more action and less planning, this smooth looking LED is guaranteed to save time, and money on your next project.

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- 3 way wire connectors



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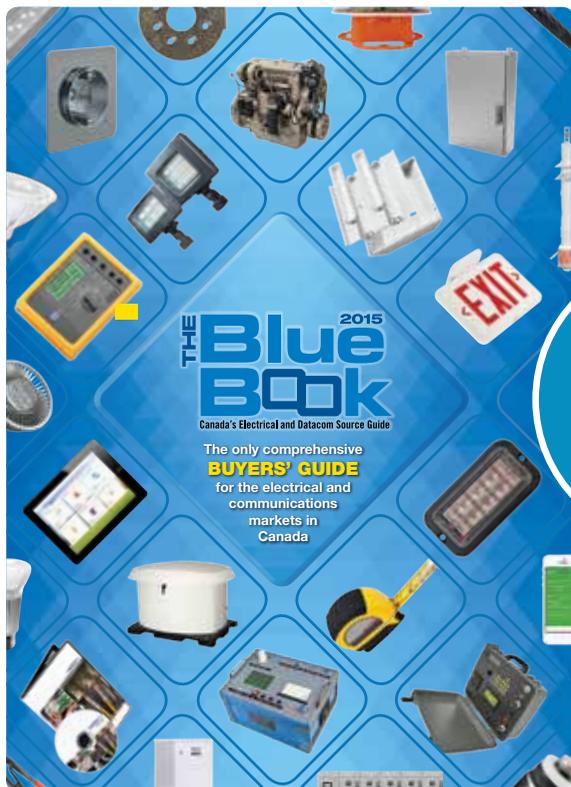
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**Marathon TEAO cooling tower motors with BCP**



Marathon Motors has a new line of totally enclosed air-over (TEAO) cooling tower motors with BCP—Bearing Current Protection—using AEGIS Shaft Grounding Rings. They feature BlueChip-quality, 100% cast iron construction, internal and external epoxy paint, sealed bearings, T-drains in both endshields, drive-end bearing isolators with shaft slingers, and fully gasketed conduit boxes (with lead separators), Marathon says.

**MARATHON MOTORS**  
[www.marathonelectric.com](http://www.marathonelectric.com)

**Arlington's enclosure boxes now meet NEMA 3R**



Arlington says its UV rated enclosure boxes now meet NEMA 3R requirements for outdoor use. The boxes are available in three sizes: 7 x 8 x 3.5-in. (EB0708), 11 x 11 x 3.5-in. (EB1111), and 12 x 12 x 4-in. (EB1212, with or without a back plate). The back plate allows an installer to mount components to the plate even after the box is mounted.

**ARLINGTON**  
[www.aifittings.com](http://www.aifittings.com)

**Fluke 25 micron macro and 4x lenses**



The 25 micron macro lens from Fluke can identify defects that might otherwise be too small to see on targets like PCB boards, Fluke says. Additionally, the new

4x telephoto lens gets users a four times magnified view of a target at a distance, so targets like a high electrical line or a tall flare stack can be inspected. The 4x telephoto is compatible with Fluke TiX560, TiX520, Ti400, Ti300, and Ti200 infrared cameras. The 25 micron macro is compatible with Fluke TiX560 and TiX520 infrared cameras.

**FLUKE**  
[www.fluke.com](http://www.fluke.com)

**FLIR's CM174**

FLIR's CM174 imaging clamp meter is powered by the Lepton thermal camera core. The CM174 is the "world's first all-in-one electrical clamp meter", equipped with a built-in thermal imager, FLIR claims, adding it is the only clamp meter that visually identifies temperature anomalies before they become a major problem.

**FLIR SYSTEMS**  
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# Electric shock drowning and Section 78

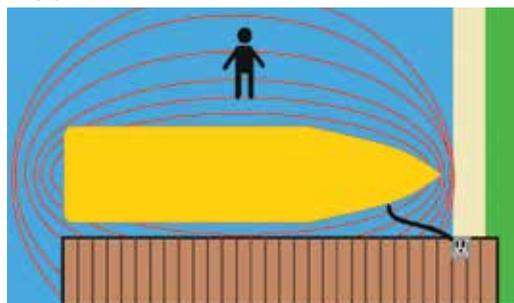
Have you ever noticed signs around marinas, yacht clubs and docking facilities that warn you against swimming in those areas? Most people assume this is to prevent swimmers from being crushed between boats, but the real hazard associated with these areas is electric shock.

When current leaks from an electrical circuit to a surrounding body of water, the water becomes energized. This can happen, for example, when there is a fault to the hull of a docked boat connected to shore power. The energized boat's metal hull, railing or ladder leads to voltage gradients being set up in the vicinity of the boat, as shown in Figure 1.

A person entering the area where these gradients are present becomes a lower resistance path compared to the water around them and, as a result, their entire body becomes a conductor.

This total body shock can be strong enough to interfere with the brain's signals to the body that control speech and muscle function, meaning the victim is neither able to swim

FIGURE 1



away nor call for help. While it is not the cause of death, electric shock is what sets the grim wheel of electric shock drowning into motion.

ESD tends to occur more frequently in fresh rather than salt water due to the former's higher resistance. There have been hundreds of reported ESD cases across North America, and the lack of visible trauma to the body caused by electric shock leads us question how many ESD incidences go unreported.

Thankfully, the 2015 CE Code contains changes to Section 78 that will help mitigate the risk of ESD.

Changes in Rules 78-052(4) and 78-102(3) require that the 125V, 15A or 20A receptacles installed outdoors on fixed or floating piers, docks and wharves—including those intended to supply shore power to boats—be protected by a GFCI of the Class A type.

This new requirement is a big step forward in mitigating the hazard of electric shock drowning. Granted, it will add some cost to the installation of shore power receptacles, but the added expense is justified considering the lives that will be saved. **EB**

*Nansy Hanna is the director for Engineering & Program Development at Electrical Safety Authority (ESA) where, among other things, she is responsible for product safety, code development, improving harmonization and alternative compliance, worker safety, and aging infrastructure programs. She is a LEED-Accredited Professional and a member of CSA CE Code-Part I, Sections 24, 32, 46, 50 and 64. Nansy can be reached at nansy.hanna@electricalsafety.on.ca.*



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

Questions and answers compiled by the Electrical Safety Authority | VISIT WWW.ESASAFE.COM

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

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

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

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

#### Question 1

In a manufacturing facility, where objects are sprayed outside of a spray booth with flammable finishes, the space around the sprayed goods is considered Class I, Zone 1 as follows:

- a) 3 m horizontally and 3 m vertically
- b) 6 m horizontally and 3 m vertically
- c) 6 m horizontally and 1 m vertically
- d) 7.5 m horizontally and 1 m vertically

#### Question 2

The minimum headroom in the working space around an elevator controller and disconnecting means shall be:

- a) 1.6 m    b) 2.0 m    c) 2.2 m    d) 2.5 m

#### Question 3

Conductors of Class 1 circuit of No. 16 AWG copper that does not extend beyond the equipment enclosure are not required to be protected by overcurrent protection.

- a) True    b) False

#### Answers:

EBMag October 2015

Q-1: Plug fuses and fuse holders shall not be used in a 240V single-phase, 3-wire grounded system.

b) False. Rule 14-202.

Q-2: What is the maximum continuous load permitted on a service switch when marked for continuous operation at 80%, and is supplied by single conductor cable in free air?

d) 70%. Rule 8-104(5).

Q-3: The radius of the curve on the inner edge of bends made on smooth aluminum-sheathed cable shall be not less than \_\_\_ times the external diameter of the sheath for cable more than 38 mm in external diameter.

d) 15 times. Rule 12-712(2).

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## UPDATED "Underground" and "Overhead" Systems Standards

CSA Group just published two new editions that pertain to the CE Code Part III for power distribution and transmission areas critical to public safety and business continuity, specifically to the electrical protection, safety & design criteria for both overhead & underground systems.

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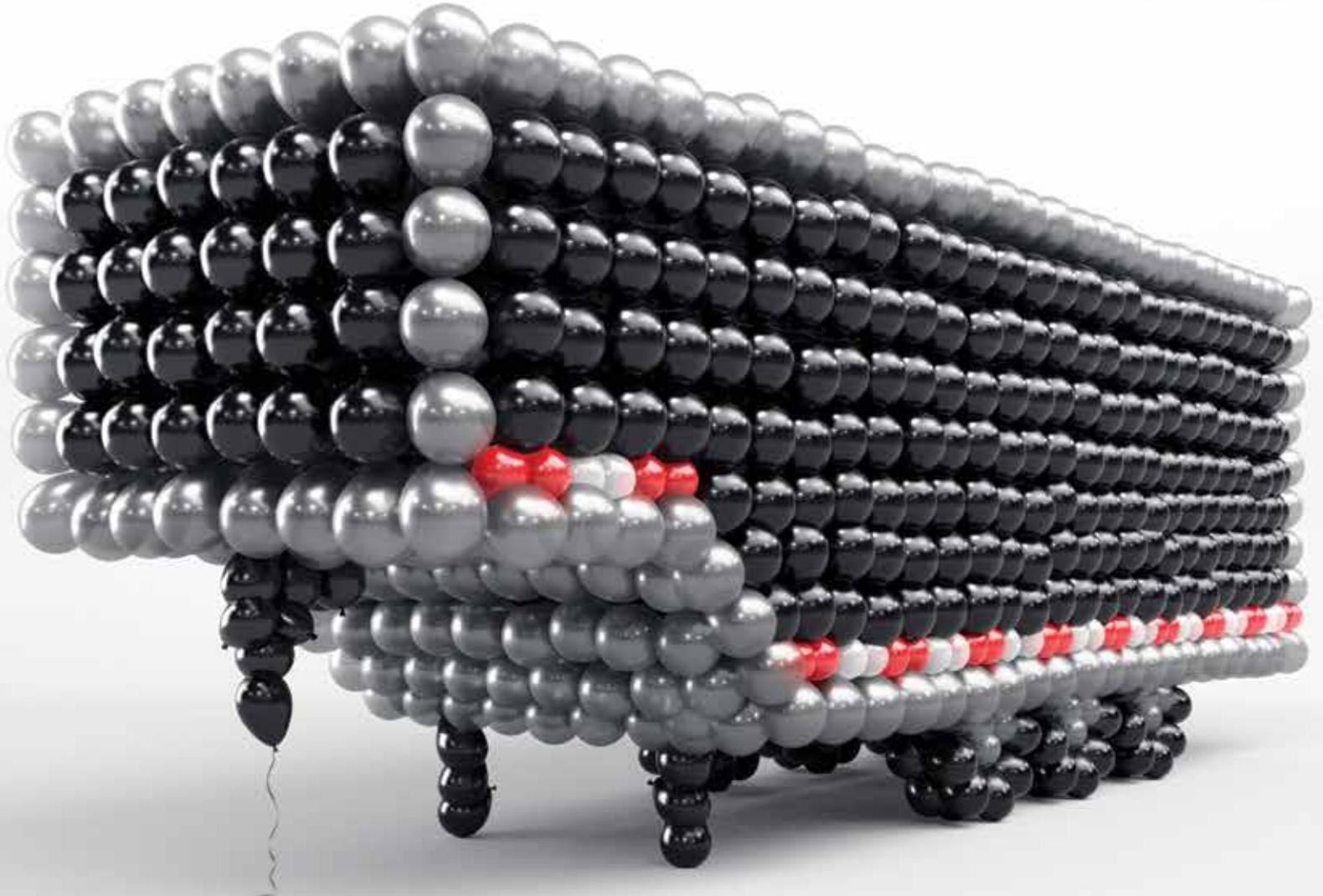




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