

DECEMBER 2016 || VOLUME 52 || ISSUE 12

# ELECTRICAL BUSINESS

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## KUDOS TO 2016'S ELECTRICAL SAFETY CHAMPS

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goal we are all  
chasing" P.10

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AD's 2016 meeting

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from the **EDITOR**

ANTHONY CAPKUN

## Flat & weak: key words for economy 2016/2017

**“T**he good news after the 2008 Lehman crash is that we’ve been chugging along, and haven’t suffered a deep, deep recession,” said economist Maureen Farrow at the latest Economic Forecast Day hosted by Electro-Federation Canada, adding, “The bottom line? Weak growth and low inflation.”

In fact, the word “weak” came up a lot during Farrow’s presentation.

“We’re not going to see any pick up in the economy over the next six to nine months,” Farrow advised. As she proceeded through numerous slides, it became apparent that—with the exception of India—the world is, at best, just barely chugging along. “Some places in Europe still have 30% to 40% youth unemployment,” she noted.

The central issue, said Farrow, is weak global demand. We have excess capacity globally, and world trade remains weak. China is not the engine it was in years past, Brazil has hit bottom, and Japan and France are basket cases, she said.

Farrow figured the Canadian dollar will settle into \$0.74 to \$0.78 on the U.S. dollar. “We’re not going to be having cheap holidays in Florida this winter,” Farrow said.

“The U.S. economy will be picking up in 2017, and the U.S. consumer is in good shape.” As for Canadian consumers, “household debt is still quite bad”.

Speaking of debt levels, Farrow noted that, federally, Canada’s debt levels “are under control”, but the situation in, say, Ontario—where the debt is at \$300 billion—“is horrendous”.

“We are at historically low interest rates,” Farrow said, and when they eventually rise, they won’t rise quickly. “It will be slow.” With these interest rates, Farrow said it’s a good time “for governments to spend on infrastructure”.

“The Liberal government has done a good job raising or fixing Canada’s profile internationally. Now it’s time to focus on domestic issues. Large infrastructure projects will be helpful,” she said.

On that note, do you still need a New Year’s Resolution? If so, resolve to me and our Level Up columnist Andrew Houston for “Make 2017 your Best Year for Profits & Freedom”—a webinar we are presenting January 12, 2017, where you will begin to learn strategies for plugging the leaks in your profitability and resolving issues regarding your time and team, profits and cash flow, and marketing and sales.

Visit [EBMag.com/webinars](http://EBMag.com/webinars) for more. **EB**

[acapkun@annexweb.com](mailto:acapkun@annexweb.com)

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## Registration open for ECAO's 2017 conference

You can now register for the 2017 industry conference of Electrical Contractors Association of Ontario (ECAO), being held May 21-27, 2017, in Munich, Germany. And, for the first time, your registration will be completed entirely online. Visit [ecaomunich2017.ca](http://ecaomunich2017.ca).

ECAO ([www.ecao.org](http://www.ecao.org)) says it is planning an exceptional program, including improved business and networking sessions, not to mention the chance to explore Munich's Bavarian hospitality and culture.

Business sessions will feature industry leaders from both Munich and abroad, says ECAO, including a Gold Seal-accredited half-day seminar by Dr. Awad Hanna on Managing Field Productivity to Improve the Bottom Line.

## EXCLUSIVELY AT EB MAG.COM

EBMag recently returned from the annual North American Meeting of Affiliated Distributors' Electrical Supply Division (NAM ESD), where both AD distributors and suppliers gather to talk shop and—just as importantly—catch up with both one another and Electrical Business Magazine. *Check out the feature on page 7, with links to more online.*

EFC recently honoured the 2016 award recipients of its 3rd annual marketing awards program, with EBMag proudly sponsoring the Event & Tradeshow Category. *Learn more about marketing prowess at [tinyurl.com/zl5ubbr](http://tinyurl.com/zl5ubbr).*

Team "9 is Enough" was recognized for managing to squander 12 balls over 9 holes of "Best Ball"—a new record for the annual Electric Elle Golf Tournament. *Visit [tinyurl.com/zdhujuwq](http://tinyurl.com/zdhujuwq) to see more of the fun.*

For the latest industry news, events, solutions, stories and more from the industry, go to **EBMAG.COM**

## New tagline marks Siemens' founder's 200th birthday



"Ingenuity for life is about how technology connects Siemens to society," said Siemens Canada CEO Robert Hardt on the launch of the company's new global brand "Ingenuity for life".

Siemens Canada ([www.siemens.com](http://www.siemens.com)) says this launch reinforces the company's commitment to "engineering the future of Canada", and coincides with the 200th birthday of company founder Werner von Siemens

## Wind turbine/tower-maker TSP fined again for workplace injury

TSP Canada Towers Inc.—a manufacturer of wind turbines and towers in Thorold, Ont.—pleaded guilty and was fined \$75,000 after a worker was critically injured when a one-ton structural steel ring fell from a storage rack.

According to Ontario's Ministry of Labour, in April 2014, TSP workers were being trained in moving a structural steel ring (a.k.a. paint ring) and placing it into a storage rack. The ring was about 15-ft in circumference and weighed about one ton.

When trying to remove a sling from the ring, the ring popped out of the rack and struck a worker, pinning him to the ground.

The worker sustained critical injuries requiring surgery.

Also noteworthy, TSP Canada Towers was fined \$80,000 just last year after a 2013 incident in which a worker was crushed by components being moved along a line.

## Alberta's power pros welcome Renewable Electricity Act

"The members of the Electrical Contractors Association of Alberta [ECAA] welcome the premier's initiatives to move our province in an environmentally responsible direction," said Darrell Castor, ECAA president ([www.ecaa.ab.ca](http://www.ecaa.ab.ca)).

Castor was referring to Alberta's announcement during the Canadian Wind Energy Association's ([canwea.ca](http://canwea.ca)) annual conference that it will soon introduce the Renewable Electricity Act, which will

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**Editor** Anthony Capkun  
[acapkun@annexweb.com](mailto:acapkun@annexweb.com)

**Group publisher** John MacPherson  
[jmacpherson@annexweb.com](mailto:jmacpherson@annexweb.com)

**Account manager** Deborah Taylor  
[dtaylor@annexweb.com](mailto:dtaylor@annexweb.com)

**Assistant editor** Renée Francoeur  
[rfrancoeur@annexweb.com](mailto:rfrancoeur@annexweb.com)

**Art director** Svetlana Avrutin  
[saurutin@annexweb.com](mailto:saurutin@annexweb.com)

**Account Coordinator** Kathryn Nyenhuis  
[knyenhuis@annexweb.com](mailto:knyenhuis@annexweb.com)

**Circulation manager** Urszula Grzyb  
[ugrzyb@annexbizmedia.com](mailto:ugrzyb@annexbizmedia.com)

**Director of soul/COO** Sue Fredericks



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"provide the legislative framework for the Renewable Electricity Program", the goal of which is to add 5000MW of capacity by 2030, administered by Alberta Electric System Operator (AESO, [www.aeso.ca](http://www.aeso.ca)).

The successful projects will be privately funded and result in new investment of at least \$10.5 billion into the provincial economy by 2030, says the government.

"We have over 1200 members that are trained and ready to work in the renewable energy industry," said John White with IBEW Local 424 ([www.ibew424.net](http://www.ibew424.net)), adding the province's plan is an "excellent way to create jobs [...] while diversifying the economy of Alberta".

The first competition will see investors bidding to provide up to 400MW of renewables in 2017.

"Together with a healthy and eco-friendly oil & gas industry, our future will be bright," Castor added. "The ECAA congratulates the Alberta government on this bold step forward."

## Glen Dimplex acquires Cadet



**Dick Anderson, Cadet's founder and current CEO.**

Privately owned heating products company Cadet Manufacturing ([cadetheat.com](http://cadetheat.com)) is being acquired by Ireland-based electrical heating manufacturer Glen Dimplex Group ([www.dimplex.com](http://www.dimplex.com)).

"We are proud to welcome Cadet to the Glen Dimplex family," said Fergal Naughton, CEO of Glen Dimplex, which owns another electric heat manufacturer in Cambridge, Ont.—Dimplex North America—which manufactures additional products that Cadet will take to market.

The company will retain its name for the foreseeable future, says Dimplex, maintain its headquarters in Vancouver, Wash., and continue to be overseen by its existing management team. Dick Anderson, Cadet's founder and current CEO, will continue with the company in a consulting role. Cadet's current president, Hutch Johnson, will be promoted to CEO.

## Lumen celebrates Maritime branches with grand openings



**Lumen regional director of Atlantic Canada, Shannon Fougere (left) with Glenn Leaman, Moncton branch manager.**

PHOTO COURTESY SONEPAR CANADA.

Electrical distributor Lumen hosted the official grand openings of its Atlantic Canada branches in Dartmouth, N.S., and Moncton, N.B. earlier this fall.

Lumen is a Quebec-based division of Sonepar Canada. It began its expansion into the Maritimes with a 12,000-sf express branch in Dartmouth. Afterward, Lumen opened its 34th branch in Moncton.

The celebratory event showcased both locations to customers and vendors; attendees were able to speak with Lumen associates and receive a tutorial on the EleKnet eCommerce platform.

## Electrofed welcomes Alliance Electrical

Electro-Federation Canada welcomed Alliance Electrical Supply (Brampton, Ont.) as its newest Distributor member ([www.allianceelectricalsupply.com](http://www.allianceelectricalsupply.com)).

The distributorship was founded roughly one year ago by Vince Antilope, Armando Canzio and Chris Horsman. They also just announced their membership with IMARK Canada.

## UL 9540 residential energy storage certification coming to Canada

Underwriters Laboratories ([www.ul.com](http://www.ul.com)) reports it has certified its first Subject 9540 residential energy storage application in the States, and EBMag has learned the Standards Council of Canada ([scc.ca](http://scc.ca)) is in the process of approving UL 9540 as a national standard.

According to Dagmar Ebaugh, global public relations with UL, the publication of ANSI/CAN/UL 9540 is expected before the end of the year.

UL Subject 9540 is a new safety standard for energy storage systems (ESS),

covering electrical, electrochemical, mechanical and other types of storage technologies for systems interacting with a utility grid, as a standalone supply, or in multiple operational modes, etc.

## Manitoba joins New West Partnership Trade Agreement

Manitoba has joined the New West Partnership Trade Agreement, under which partner jurisdictions reconcile or mutually recognize occupational standards so people can work inter-provincially.

Skilled tradespersons certified in one province will be recognized as qualified in all of them. Workers will not need to go through material examinations or training to practice their chosen occupation.

However, some occupations are not regulated in all provinces. When moving to a province that regulates from one that does not, the individual will have to meet the requirements of the regulatory authority to obtain a licence or certification to work there. Over time, reconciliation of all occupations should create full labour mobility for all occupations.

With the inclusion of Manitoba, the partnership encompasses more than 11 million people with a combined GDP of over \$750 billion. The original NWPTA has been fully implemented since July 1, 2013. Visit [newwestpartnershiptrade.ca](http://newwestpartnershiptrade.ca). **EB**

## CALENDAR

**EB IEEE IAS Electrical Safety Workshop**  
Jan. 31-Feb. 3, 2017, Reno, Nev.  
Visit [tinyurl.com/jfkjhz7](http://tinyurl.com/jfkjhz7)

**Saskatchewan Safety Council Industrial Safety Seminar**  
Feb. 6-8, 2017, Regina, Sask.  
Visit [www.sasksafety.org](http://www.sasksafety.org)

**EAM Mid-Canada Electrical Expo**  
*Electrical Assoc. of Manitoba*  
*(form. Manitoba Electrical League)*  
Feb. 22-23, 2017, Winnipeg, Man.  
Visit [www.eamanitoba.ca](http://www.eamanitoba.ca)

**EB MCEE**  
*Mécanex • Climatex • Expoelectriq • Éclairage*  
Apr. 26-37, 2017, Montreal, Que.  
Visit [mcee.ca](http://mcee.ca)

**EB** Indicates EB will be there.

Visit [EBMAG.COM](http://EBMAG.COM) for an extensive list of upcoming industry events.

# “AND IT ALL STARTED WITH ELECTRICAL”

Reflections from Affiliated Distributors' 2016 meeting, Electrical / **ANTHONY CAPKUN**



Canadian winners (left to right): Jim Rotz, First Alert Canada (BRK); Tim Kennedy, Source Atlantic; Brent Burtt, Bird Stairs (J.W. Bird); Jim Milne, AD Canada; Carol McGlogan, Philips Lighting Canada; Steven Silverstein, Liteline Corp.

PHOTOS A. CAPKUN



Looking for more photos from the 2016 AD North American Meeting: Visit [EBMag.com](http://EBMag.com) and, under “News & Articles”, click on “Photo Gallery”, or follow [tinyurl.com/jt8wqub](http://tinyurl.com/jt8wqub) for a direct link.

**T**he annual North American Meeting of Affiliated Distributors' is where both AD distributors and suppliers gather to talk shop, and catch up with one another—and with *Electrical Business Magazine*.

The meeting was punctuated by a few key items on my agenda, including the keynote luncheon address by CEO, Bill Weisberg, who remarked, “AD marks 35 years [this year], and it started with vision and courage”.

AD now encompasses over 3800 branches from 550+ independently owned members across three countries and seven industries... “and it all started with Electrical,” Weisberg reminded.

A personal highlight for me is the

Spirit of Independence awards dinner, which recognizes distributors and suppliers across several categories (e.g. Performance, Annual Planning, Marketing Excellence, MVP, Giving Back, etc.).

We are a small nation, so it's nice to see suppliers and distributors get recognized in dedicated Canadian categories, but it's also great when a Canadian team takes honours in a category open to everyone, such as Philips Lighting Canada, which grabbed the award for Marketing Excellence this year.

The Maritimes, meantime, swept the Member categories. The Canadian winners of the year for performance (including 2nd and 1st runners-up) are:

## **Member (over \$10 million)**

- **Winner:** Bird Stairs (N.B.)
- **1st runner-up:** Deschênes et Fils (Que.)
- **2nd runner-up:** Eddy Group (N.B.)

## **Member (under \$10 million)**

- **Winner:** Source Atlantic (N.B.)
- **1st runner-up:** Western Equipment (Ont.)
- **2nd runner-up:** Gimpel Electric Supply (Ont.)

## **Supplier (over \$5 million)**

- **Winner:** Liteline Corp.
- **1st runner-up:** Northern Cables
- **2nd runner-up:** Royal Pipe

## **Supplier (under \$5 million)**

- **Winner:** First Alert (BRK)
- **1st runner-up:** Louisville Ladder
- **2nd runner-up:** Panasonic Canada

The meeting is truly the place for bumping into people and hearing news I may not have heard otherwise. For example, Bird Stairs has opened a few new branches; not surprising, considering the massive growth they've seen since last year.

And the folks at Northern Cables were showing off a new power and control cable (launching that week!), Type ACIC, for smart buildings, which allows control circuits to be placed in a cable alongside light or power circuits.

We also got some more information on the acquisition of Royal Building Products by Westlake Chemical, and a new product series from IlSCO stemming from its recent acquisition of Surge Suppression Inc.: Surgency surge protective devices (SPDs) for commercial, industrial and residential applications.

Thanks to all of you for sharing your stories!

This year's meeting was held at the beautiful Gaylord National Resort & Convention Center in National Harbor, Md. A special thanks to all the AD Canada and AD folks who always make the meeting so enjoyable and productive. You know who you are! **EB**

**Next year's AD NAM ESD returns to the Gaylord Texan Resort in Grapevine, right outside Dallas, September 25-27, 2017.**



Ontario's **Electrical Safety Authority** ([www.esasafe.com](http://www.esasafe.com)) reports **Honey Electric's Dale MacDonald** (top) has been elected to the board. Based in Chatham, Ont., MacDonald and his brother have operated Honey Electric Ltd. ([www.honeyelectric.com](http://www.honeyelectric.com)) for more than 40 years, says ESA. Meantime, **John Raepple** (bottom)—president and owner of



**John Raepple Electric Ltd.** ([www.jrel.ca](http://www.jrel.ca)) of Cambridge, Ont.—concluded his term after nine years. PHOTOS A. CAPKUN.

General manager **Francis Chan** has announced his retirement from **Ultrasave Lighting** ([www.ultrasave.ca](http://www.ultrasave.ca)). Ultrasave president **Frank Luk** will assume his duties. In 2013 Chan initiated **Energy Efficient Lighting Company Limited** (EEL) as a subsidiary of Ultrasave. See our video from last year's grand opening of EEL ([www.eelighting.ca](http://www.eelighting.ca)) and Ultrasave Lighting's Markham, Ont., facility at [tinyurl.com/jm9lmr3](http://tinyurl.com/jm9lmr3).

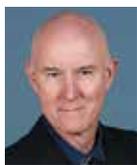


At ECAO's 2016 annual conference, **Ove Bakmund** (left) accepts the **Douglas J. B. Wright Award** from 1st vice-president **Mark Lloyd** (centre) and president **Dan Lancia**. PHOTO BY ALDO VETTESE, COURTESY ECAO.

The **Electrical Contractors Association of Ontario** ([www.ecao.org](http://www.ecao.org)) has awarded the 2016 Douglas J. B. Wright Award to **Ove Bakmund**, co-founder and principal owner of **Net Electric Ltd.** ([net-electric.com](http://net-electric.com)). He has been an ECAO president and vice-president, and a member of the Greater Toronto ECA board.



**Louis Beaulieu** has been appointed general manager of **Ouellet Canada** ([www.ouellet.com](http://www.ouellet.com)). He spent the past year as assistant GM. **EB**



MIKE DOHERTY

## Risk assessment clarity in the workplace

In my last column, I addressed the basic theory and concepts behind CSA's family of occupational health & safety (OH&S) standards. Among them is CSA Z1000 "Occupational health & safety management", CSA Z463 "Guideline on maintenance of electrical systems", CSA Z460 "Control of hazardous energy: lockout and other methods" and, of course, CSA Z462 "Workplace electrical safety".

If I had to pick just one concept that I wanted everyone—be they front-line managers, supervisors or workers—to understand with great clarity, and that business units would implement flawlessly for every electrical task, it would be the Risk Assessment Procedure from Z462.

Too often, clarity is not provided from senior management or executive teams, which can certainly be the root cause of safety dysfunction in any business unit.

(While there are endless resources on this subject, I strongly recommend Patrick Lencioni's "The advantage: why organizational health trumps everything else in business," which describes the importance of workplace clarity very well.)

The beauty of the Risk Assessment Procedure is it provides great clarity to those doing electrical work (though it works just as well for any hazard in any workplace). The three steps below lay out an incredibly effective yet relatively simple process that—regardless of task—every worker can follow to create a quality job plan:

1. Identify hazards
2. Assess risks
3. Implement risk control (according to a hierarchy of methods)

Discussions over the last number of decades describe similar procedures for safer work practices, but the sheer multitude of concepts, definitions and procedures (e.g. hazard analysis, job safety analysis) have often led to significant confusion and, sometimes, a lack of credibility for those tasked with safe work planning at the field level.

A lot of these concepts are great, but they lack a consistent thought process for risk management. Add to that our growing mobile workforces (of which electrical contractors are a great example), and the

capacity for misunderstanding grows.

How many times have you heard a worker say, "Just tell me what you want me to do.?"

Workers, supervisors and all levels of manager and owner need to believe they are executing safe work in a timely and efficient manner. There is just no other acceptable way. So the challenge, then, is to ensure everyone involved in job planning and task execution clearly understand and use Z462's Risk Assessment Procedure.

Ask your field supervisors and workers about the first steps behind their job plans, especially the safety portion. What do they do first and foremost? Do they have the knowledge, competence and clarity to carry out the three steps of a quality Risk Assessment Procedure?

When you visit the field and ask your team about the three steps, and if they have no idea what you're talking about, then you need to ask yourself whether

clarity has been provided from the top.

But, when you visit the field and ask your workers about the three steps, and they understand what it all means and the rigour required for safe work, you can be assured you're well on your way down the road of safety excellence.

When a managed OH&S system provides clarity, it's amazing just how efficient your safe work planning can become. In truth, it becomes a measurement of your organizational health in numerous areas. Workers can and will implement outstanding safe work practices in the field when clarity is provided from the top.

On a final note, there's no better place than the 2017 IEEE Electrical Safety Workshop (January 31 to February 3, Reno, Nev.) for connecting with experts whose mission is to make safe electrical work practices the norm. To learn more, visit [EBMag.com/events](http://EBMag.com/events) and watch EBMag's video "The Most-Efficient Electrical Safety Education... Anywhere!" at [tinyurl.com/lr8q7wp](http://tinyurl.com/lr8q7wp). **EB**

A subject-matter expert on electrical safety, Mike Doherty is an independent electrical safety consultant and trainer for eHazard in Canada and the president and owner of Blue Arc Electrical Safety Technologies 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 in 2006. His specialties include electrical safety management, consulting, training, auditing and electrical incident investigations. Mike can be reached at [mike.doherty@e-hazard.com](mailto:mike.doherty@e-hazard.com).



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# “THE WORTHY GOAL WE ARE ALL CHASING”

Meet Canada’s 2016 electrical safety champions / **ANTHONY CAPKUN**

“A workplace free from electrical hazards is the worthy goal we are all chasing,” says Andrew Cochran, president of I-Gard, and we couldn’t agree more with our sponsor of the 2016 edition of the Electrical Safety Champion Awards program. “I-Gard would like to acknowledge the contribution and dedication to this goal of the award winners and all of the participants.”

Just as in our inaugural year (2015), we received some excellent nominations from across the country, making the final selection difficult indeed. I applaud everyone who took the time to submit their safety stories, and I’m only sorry we cannot recognize each and every one of you.

That said, kudos to our 2016 champions: Jason Loney of Grand West Electric Ltd., Nixon Electrical Services Ltd. and Horizon Utilities Corp.

As you read the vignettes that follow, you’ll notice a few things our winners share in common—not just with each other, but with our 2015 champs, too. They are all driven by a passion for safety; they see safety as, not just a moral obligation, but good business, too; they encourage near miss reporting; and they push continuous training and education, knowing the safety journey really has no end.

Maybe you’re just getting started on your own safety journey, or maybe you’re looking for new ways to take your existing program further; whatever the case, after reading these interviews with our champs, our hope is you will find something in their best practices to take back to your own organization.



## NOMINATIONS FOR 2017

We’re expanding our national awards program to greater levels next year. Stay tuned for details in 2017!

### INDIVIDUAL CHAMPION WINNER: Jason Loney, Grand West Electric Ltd. (Calgary, Alta.)

“Our safety culture has really changed since Jason took control of it; he created systems and processes that were simple to follow, and basically everyone in the company has bought into it. Without his drive and passion for safety, it would not be the culture it is today. He’s really the driving force behind it,” says GWE co-founder Anthony Dallazanna.

Jason Loney’s approach to health & safety is by being a leader himself; he remains an absolute professional at all times [from] taking a phone call and holding monthly foreman meetings, to his attention to detail while hosting any of his numerous training courses, ensuring that each employee has a thorough understanding of every aspect of the course and can walk away confident in what they have learned.

So opens the Nomination for Jason Loney, safety coordinator and site supervisor with Grand West Electric (GWE), whose form was sent in by office administrator Margaret Vandenberg, Jason’s “right-hand-person”.

“She helps me a lot with safety in the company, with file-keeping, helping me schedule things,” says Jason, with Anthony adding, “She’s imperative to Jason’s success; she tracks down everyone and makes sure everyone submits all their forms, and she stays on top of people from an administrative end.”

Jason is GWE’s first safety officer; he is continuously upgrading his knowledge by taking various courses, then sharing this knowledge with his co-workers and the company. By encouraging all employees



Jason Loney (right), safety coordinator and site supervisor with Grand West Electric (GWE), Individual category winner, along with Chad McIntyre, representing category sponsor I-Gard, specialists in high-resistance grounding.

PHOTO BY DAVID OLECKO PHOTOGRAPHY.

“I’m not there to tell them how to run their site. What I will do is just focus on safety. They understand that, and respect that.”

to voice their opinion, the safety program constantly updates forms, policies and procedures to guarantee everyone goes home safe.

Jason started with GWE in April 2007. “I was as green as you could get. It wasn’t until a few years later I met one of my great mentors, Carl Savard, and he inspired me and started mentoring me into this position.”

When Jason first met Carl—who was brought in as a third-party consultant—he noticed how seriously Jason took safety. That’s some testament to the power of mentorship, as Jason has been doing this safety gig

solo for the last several years. “It’s great that I had him as a mentor, and a company that helped me flourish in this respect.”

“He’s very dedicated,” adds Anthony. “On several occasions he’s had Learn-a-Thons in our shop where he’ll bring in anybody that needs training on, say, fall protection, scissor-lift, or whatever.” And he’ll do this on his time on a Saturday, notes Anthony. “He donates his Saturdays for safety. That’s dedicated.”

One of the things they’ve done in conjunction with sister company All West Electric in British Columbia—with full support of upper management—is taken several apprentices, put them through certain training and mentoring, then had them join Jason in a safety committee and, together, perform site visits and audits, and talk about training and PPE requirements. “It’s a great way to get everyone in the company involved.”

How does Jason get buy-in from GWE’s workforce, which ranges from roughly 115 peak to around 80? “Not only am I the safety guy, but I’m also a Red Seal electrician and I run my own site. So I know exactly what they go through. I’m not just someone reading out of a book.”

“When I do site visits or inspections, or talk to the guys, I’m not there to tell them how to run their site. What I will do is just focus on safety. They understand that, and respect that,” Jason adds.

“There’s no feeling Jason is there to police them. He’s there as support. People aren’t afraid of him. He’s one of them,” Anthony adds.

Jason says the company encourages near miss reporting so they can spot trends. “Our No. 1 goal is always prevention... trying to be proactive rather than reactive. We encourage employees to come forward and tell us what happened. What can we do better as a company overall to prevent such a thing from occurring again?”

“A lot of people coming into the company can’t believe the standards that we have,” says Jason, proudly, noting that, “In the long-run, if you don’t have buy-in from the very top of your company, the whole system will fall apart.”

“You want to make sure that everyone gets home safe, and that safety is taken seriously,” says Anthony. “Jason

has succeeded in bringing GWE to a very safe working environment for all employees,” Margaret adds.

“I definitely want to thank Anthony Dallazanna, Gabriel Rosati, Margaret Vanderberg, and management and staff at GWE, as well as our Safety Committee, and Carl Savard for being a such great mentor to me.”

Well done, Jason, and the team that surrounds and supports you.

### **ELECTRICAL CONTRACTOR WINNER: Nixon Electrical Service Ltd. (Moosomin, Sask.)**

I have worked for many contractors, but none who put safety over profit like Dale [Nixon]. I am honoured to work for such a great company.

That was one of the statements that caught our attention in the Nomination for Nixon Electrical. When we contacted Nixon, they were surprised to learn they been entered in the awards program. It turns out the employee above—so impressed with the company’s attitude toward safety—had nominated them, totally catching owner Dale Nixon and safety officer Ms. Jody Belhumeur by surprise. The employee wrote:

As an employee of Nixon Electrical, I have seen nothing but commitment for safety from owner Dale. He provided dispensing machines for all safety equipment, including cut-proof gloves, safety glasses, etc. He has two full-time safety officers and implemented the highest safety procedures, including a reward program for safe employees.

“I know he really cares about his employees,” explains Jody. “One of the strongest things Dale and I feel about is prevention—being proactive with our safety. We have a very strong near miss program, and both of us feel it is because of this that we haven’t had any major incidents or medicals or anything like that over the past three or four years.”

“We really support the guys when something *could have happened* over the course of their day,” Jody says, whether it’s a dropped object, forgetting their PPE, etc., “by encouraging them to fill out a Near Miss form.”

A few years ago, she and Dale would randomly pick a near miss



Dale Nixon with wife Patty Jo.

PHOTO COURTESY NIXON ELECTRICAL SERVICE LTD.

**“I have worked for many contractors, but none who put safety over profit like Dale. I am honoured to work for such a great company.”**

every month and award a prize. “And the reports would become something we would talk about at our monthly meetings, so that everyone is aware,” Jody adds.

As time went on, to mix things up a little bit, Dale and Jody challenged the guys to submit four near misses a month, and those names would be put into a random draw for two airfare tickets anywhere in Canada. “It was pretty awesome,” says Jody.

She admits that, when new guys come aboard, they are hesitant to share their near misses, “but after being here for a month or two, they see it’s a positive thing... you’re not going to get into trouble because you dropped a screwdriver from a lift”. She and Dale also use the same form to encourage sharing ideas that just make good safety sense, and to report “interventions” (for example, when an employee reminds another to put on his safety glasses).

Nixon Electrical Service Ltd. was founded in 1994 as a one-man service company working in the oil patch in Alberta before becoming established in Moosomin. The company now has several locations through the province, with a workforce ranging from 34 to 50+ tradesmen. They are also a member of ISN (ISNetworld connects clients “with safe and reliable contractors”).

And the company is proud of its commitment to safety, with its daily toolbox meetings, weekly and monthly safety meetings, additional training and courses for specific equipment and workplaces, and more.



Anthony Capkun, editor of Electrical Business Magazine (left), Horizon Utility's president & CEO, Max Cananzi (centre), and Kathy Lurette, VP Utility Operations. PHOTO BY HORIZON STAFF PHOTOGRAPHER.

“Anyone working for Nixon will carry this safety culture with him to their next venture,” wrote the nominating employee. “I believe that Nixon’s safety practices are contagious, and any employee leaving the company will pass them along to their new workplace.”

Now *that’s* the kind of contagion we like hearing about!

**ELECTRIC UTILITY WINNER: Horizon Utilities Corp. (Hamilton, Ont.)**

This year’s Utility category champion, Horizon, was the first electric utility to achieve certification under CSA Z1000 “Occupational health & safety management”. For a utility that has demonstrated leadership in advancing electrical safety knowledge and awareness for years, we asked them why Z1000 certification was important.

“We were already very focused on safety in the organization, but we didn’t really have an overall management tool to manage all our health & safety and wellness initiatives,” explains Kathy Lurette, VP utility operations, who notes Z1000 gives them the framework they like, while Horizon’s internal audit team keeps them “on their toes”.

“We’ve seen some huge improvements in things like housekeeping across our organization,” Kathy says, adding their high-risk workforce has a standard process for doing risk assessments, with easy access to the

**“In the old days, people in the line trade always used to say ‘It takes too much time’ to work safely and work to all the rules, but we’re saying that’s absolutely not the case.”**

information they need to execute work safely.

The strength of this system is its focus on promoting physical, mental and social well-being of employees, while protecting them from adverse workplace conditions. The Z1000 standard follows the Plan-Do-Check-Act model, which aids in building an effective Occupational Health & Safety Management System (OHSMS).

Leading up to the final Z1000 accreditation audit in 2015, Horizon’s safety efforts were validated with an Infrastructure Health & Safety Association (IHSA) President’s Award for achieving a significant safety milestone: 750,000 hours without a Lost-Time Injury. Its highest achievement, however, came in 2013, when the utility hit 2.5 million hours without a Lost-Time Injury.

“We really mean it when we say our employees are our No. 1 asset, and that’s why safety is of No. 1 importance. We really do want everyone to home at the end of the day in good shape to their families.”

Horizon believes in extending the safety message beyond its walls, as evidenced by its robust Contractor Management Program, which minimizes risks by providing the necessary tools for both Horizon to ensure contractors achieve qualification compliance and for it to effectively manage contractors/suppliers on the job. Horizon also invites local contractors to annual powerline safety seminars

targeting worker safety on the jobsite.

“We treat contractors like we treat our employees. They have to work to the same standard, same work procedures, same rules as our internal workforce,” says Kathy.

But there are other contractors to consider, she notes, like those working around Horizon’s equipment. “We saw a need to do an annual contractor safety seminar for people like roofers, crane operators, homebuilders, etc., to review the electrical hazards they will face on a daily basis, because we do still have people, for example, running into our overhead lines, not keeping 10-ft away, and so on. That’s been very well received.”

Also among Horizon’s initiatives is the Back2Basics program. As name implies, it refreshes workers on the basics of things like job planning and the EUSA Rulebook (Electrical & Utility Safety Association). “It’s important that, when everyone shows up for work, they have a tailboard meeting, a job plan that everyone understands, and they execute the job as planned,” Kathy says. “If something in the job changes, then stop and re-plan the work.”

Near miss reporting is also very important to Horizon, which they’ve supported for many years. “Our theory is the more near miss reports you have, the better.” And, like our other champs, the reports are not used to reprimand or embarrass, but to educate and improve.

Sometimes it’s the little things that jump out at you as not being so little after all. For example, Horizon conducted a Driver Rodeo to help its drivers better understand their work trucks: where they can drive them, where they will not fit, how to back up safely and how to watch for pedestrians and bystanders... particularly curious children.

“In the old days, people in the line trade always used to say ‘It takes too much time’ to work safely and work to all the rules, but we’re saying that’s absolutely not the case,” Kathy contends. “If you don’t work safely and there’s an incident, your productivity suffers greatly and the job takes longer. When you job plan properly, your productivity goes way up.”

Well done, Horizon. Here’s to the next million+ hours without a Lost-Time Injury! **EB**

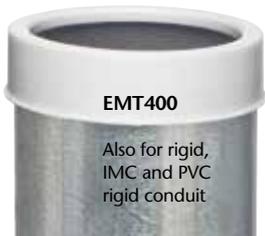
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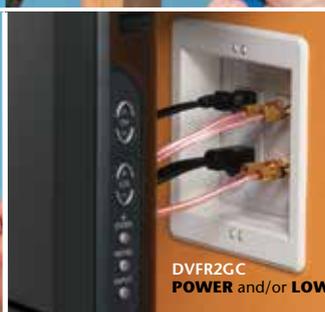
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2-GANG

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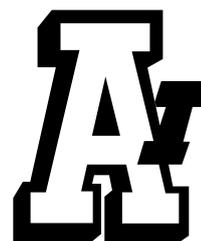
Patented. Other patents pending.



3-GANG TVBU507GC



4-GANG TVB613GC



Catalog Number	Trade Size	Cable O.D. Min	Cable O.D. Max	Wire Bundle O.D. Min	Wire Bundle O.D. Max	Conductor size # of Conductors* (AWG/KCMIL)
8412	1"	.780	1.120	.660	1.000	6/3, 6/4, 4-3, 4-4, 2-3, 2-4, 1-3
8413	1-1/4"	1.000	1.460	.870	1.370	2-3, 2-4, 1-3, 1-4, 1/0-3, 1/0-4, 2/0-3, 2/0-4, 3/0-3
8414	1-1/2"	1.360	1.770	1.250	1.590	2/0-4, 3/0-3, 3/0-4, 4/0-3, 4/0-4, 250-3, 250-4
8415	2"	1.700	2.200	1.550	2.050	250-4, 300-4, 350-3, 350-4, 500-3
8416	2-1/2"	2.100	2.700	1.950	2.400	500-3, 500-4, 600-3, 600-4, 750-3
8417	3"	2.500	3.300	2.350	3.000	600-4, 750-3, 750-4

Patented



\* Examples of 3- and 4-conductor cables accommodated.

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## CAN YOU SEE ME NOW?

An analysis of the use of LED lighting for videoconferencing / **J. YORGEY, F. NEHER, J. VOLKERT AND C. KATRINAK**

**L**ighting a videoconferencing (VTC) environment presents a unique challenge as it must provide equal, excellent visual access to participants in the room as well as those in remote locations. The lighting must accommodate the visual requirements of the people and the camera, and provide visibility of any display materials, especially to remote participants.

Achieving the proper lighting balance requires the right combination of fixtures and control strategies.

Linear fluorescent sources have long been used to provide effective, uniform lighting in VTC environments. As LED solutions offer the opportunity to save energy and reduce costs, lighting designers are looking for assurance these solutions can also deliver similar or better results, and

to understand the additional benefits associated with using LEDs.

Dimming controls are essential to creating that ideal solution in VTC environments regardless of the source, and appropriate control solutions are the other key to success.

New research provides tangible data that will allow designers and facility managers to be more comfortable with the use of LED fixtures and controls in VTC environments, and to confidently include LED solutions into room specs and applications.

### A look at the types of fixtures required

During a videoconference, the camera doesn't see the way the human eye does. Improper lighting can cause the camera to produce saturated images or images with dark shadows on them,

resulting in poor picture quality for remote participants.

The right combination of strategically placed fixtures improves vertical illumination, creates uniform lighting on surfaces and participants and, with the addition of controls, enhances the ability to adjust contrast in the space. Critical contrasts include:

- participant-to-rear-walls
- participant-to-side-walls
- participant-to-work-surface
- display-wall-to-video-display

Other factors, including room colour and colour/texture of furnishings, can also contribute to, or detract from, effective VTC room design.

To further ensure image clarity, it is important to implement a solution that offers fluorescent fixtures with dimming ballasts and/or LED fixtures with dimmable drivers in various form-factors to fit a variety of different space types and applications.

In either case, a combination of 1x2 and 2x2 indirect fixtures provides both vertical and horizontal illumination, and helps produce images with better contrast and sharpness. The right combination of fixtures ensures high-quality lighting on the participants, walls and table surfaces, as well as the area around the display, screen or monitor.

### VTC solutions for several space types

Ideally, a corporate space will have a dedicated videoconferencing room, but space is often at a premium, and the guidelines we are defining are advantageous in a number of spaces that may be used for meetings, conferences and educational activity, such as:

- VTC rooms
- Telepresence rooms
- Distance learning spaces
- Training rooms
- Boardrooms and conference rooms incorporating video capabilities

### A look at fluorescent versus LED fixture solutions

Over the course of many years, fluorescent fixtures have proved to provide even, controllable lighting in VTC spaces, and lighting designers may be hesitant to veer away from fluorescent solutions without a clear understanding that LEDs offer equivalent lighting with additional advantages.

As they are dimmed, LEDs save energy at a roughly

**1:1**  
ratio

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**TABLE 1** Fluorescent versus LED average luminance

	Fluorescent (Cd/m <sup>2</sup> )	LED (Cd/m <sup>2</sup> )
Average from walls at 6 ft (sides)	60.3	67.9
Average from walls at 3 ft (sides)	63.4	67.3
Average from Right Wall	102.3	108.0
Average from Front Wall	25.5	21.4
Average from Back Wall	55.9	76.3
Average from Table	78.00	71.7
Average from Face — Looking at Camera	59.4	67.7
Average from Face — 45 degree down	11.4	11.6
Average from Face — Left Light	45.7	45.2
Average from Face — Right Light	46.0	42.6

**TABLE 2** Fluorescent versus LED average data variance

	Fluorescent (Cd/m <sup>2</sup> )	LED (Cd/m <sup>2</sup> )
Variance from walls at 6 ft	1038	1584
Variance from Walls at 3 ft	1736	1965
Variance from Right Wall	286	295
Variance from Front Wall	9	13
Variance from Back Wall	40	139
Variance from Table	117.8	82.0
Variance from Face — Looking at Camera	150.2	27.7
Variance from Face — 45 degree down	6.2	21.0
Variance from Face — Left Light	76.0	59.7
Variance from Face — Right Light	62.5	31.3

**TABLE 3** Fluorescent versus LED energy usage throughout dimming range

% Light Level	2x2 2 Lamp 50W T5 Fluorescent VTC Fixture H3DT550GU210		2x2 45W LED VTC LED Fixture (1.07A) L3DA4U1UMN-LA107	
	Fixture Input Power (W)	% Power Savings	Fixture Input Power (W)	% Power Savings
100%	92.5	0%	44.8	0%
90%	86.9	6%	39.9	11%
80%	80.1	13%	35.0	22%
70%	69.0	25%	30.6	32%
60%	60.0	35%	25.7	43%
50%	52.1	44%	21.3	53%
40%	42.3	54%	16.9	62%
30%	37.1	60%	13.4	70%
20%	28.2	69%	9.3	79%
15%	25.4	73%	7.2	84%
10%	22.8	75%	5.3	89%
5%	21.1	77%	3.3	93%
1%	20.1	78%	1.7	96%

LED fixtures and controls are becoming less expensive and more widely available, and now offer a viable alternative design solution, delivering benefits that make LED fixtures highly desirable in virtually any VTC application. They are energy efficient, offer long life and lower heat dissipation and, by working with the right provider, offer guaranteed compatibility between the fixture and the controls.

LEDs use less energy initially and save energy at a roughly 1:1 ratio as



they are dimmed. They provide uniform light levels/consistent colour temperature, with little degradation or colour shift over their life span, which can reach 50,000+ hours (even longer when dimmed).

Because they dissipate very little heat, LEDs further increasing energy savings by reducing demand on HVAC cooling systems. As for compatibility, the LED light source is included in the fixture, ensuring compatibility between module and driver. By choosing a manufacturer who specifically provides fixtures and controls together, you can guarantee compatibility and smooth, flicker-free dimming. Finally, lighting performance is not compromised, as LED fixtures provide the same glare-free lighting as their fluorescent counterparts.

Compatibility between the driver and fixture is key to LED lighting performance. The selection of an appropriate driver is not limited to just making sure it matches the LED module being used; the driver is the primary component that determines the best-possible dimming capabilities of the LED lamp or fixture.

It is also important to understand by what mechanism the LED driver achieves dimming: pulse-width modulation (PWM) or constant-current reduction (CCR). Drivers using CCR are critical for videoconferencing applications to ensure good performance on-camera.

**Optimized solutions**

The Illuminating Engineering Society’s (IES) design guide DG-17-05 “Fundamentals of lighting for videoconferencing” goes into great detail explaining the importance of environment when creating a space ideal for VTC functions. Among the details, it describes what efforts should be taken to ensure appropriate lighting.

The guide calls out ideal specs for light sources, including a correlated colour temperature (CCT) in the 3000K to 3500K range, and an 80 CRI (colour rendering index) or higher. It also emphasizes the importance of meeting the minimum light level requirements of the camera, and providing even contrasts in lighting throughout different parts of the room to prevent saturation and washouts.

DG-17 strongly suggests the use of controls to achieve this balance of light

levels, to provide both the minimum quantity of light without being overlit and good contrast ratios. A dimming system facilitates the ability to adjust the light levels within the space to ensure the proper balance of light.

**Modelling versus performance**

When designing a space with such specific requirements, it is vital the solution can be modelled and the results accurately predicted. Predictive models allow the designer to see the solution in terms of fixture layout and light output without investing the time and money in a physical mock-up. A trusted model delivers confidence the proposed solution will meet the space requirements prior to purchasing a piece of equipment.

Predictive modelling can be done using IES files and modelling software. By modelling the space, designing and tweaking the fixture layout—and including the IES file photometric data for the specific fixtures—the actual photometric layout of the room can be created and analyzed. This model enables the user to observe and/or analyze the light levels throughout the space, as well as the contrasts between dark and bright spots. This allows for further consideration regarding fixture type and placement, as well as the application of control systems.

**Case in point: a before/after analysis**

What follow are the results of a case study comparing the use of fluorescent versus LED fixtures and controls in a recently designed VTC room. The data will demonstrate that LED solutions can provide the same, flicker-free 1% dimming previously only available with a fluorescent solution and with lower energy use.

Table 1 shows average luminance data for the two solutions at 100%. The light output of the LED solution is capable of producing the same quantity of light as the fluorescent solution. Looking at the variance data in Table 2, we can see the variation in light output across the different surfaces is also very similar.

The variance in the data set is a measurement in the spread of values away from the mean of the set. In this analysis, the measurements can be used to represent overall difference in



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*Kelly & Doug Niessen, Kandy Outdoor Flooring*



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**TABLE 4** LED optimized average luminance

	LED (Cd/m <sup>2</sup> )
Average from walls at 6ft	29.0
Average from walls at 3ft	26.0
Average from Table	21.7
Average from Face — Looking at Camera	17.9

**TABLE 5** LED optimized maximum ratio (max:min)

	LED (Cd/m <sup>2</sup> )
Max Ratio from walls at 6ft	1.44:1
Max Ratio from walls at 3ft	1.8:1
Max Ratio from Right Wall	1.44:1
Max Ratio from Back Wall	1.6:1
Max Ratio from Faces - Looking at Camera	1.3:1

**TABLE 6** LED predicted versus measured luminance

	% Difference
Table: Point A	7.7%
Table: Point B	18.6%
Table: Point C	26.1%
Table: Point D	3.9%
Table: Point E	14.4%
Table: Point F	2.9%
Table: Point G	2.9%
Average	10.9%

light measurements along a surface. It cannot be determined from this data set what an acceptable variance is for each surface, but rather to compare the overall light environment provided by the two solutions.

When considered surface-by-surface, the data set variances between the fluorescent and LED solutions tend to mirror each other along a surface. This illustrates that the fluorescent and LED solutions provide equivalent light outputs, and the variance in light level is most likely due to the fixture layout rather than differences in the light sources themselves.

**Compatibility between the driver and fixture is key to LED lighting performance**

As discussed previously, LED solutions have intrinsic benefits, the primary one being energy savings. The direct comparison of equivalent 2x2 LED and fluorescent fixtures shows that, at 100% output, the LED fixture uses about half the power of the fluorescent. They also save energy linearly, resulting in further energy savings as the LED fixture is dimmed, especially as they are dimmed toward their low end. This is important to consider since these fixtures should be paired with a dimming system and dimmed down to optimize light output.

In this study, the optimized solution was implemented with all light source types present in the room, including the wallwash fixtures, indirect wash fixtures and recessed downlights. Having already tested, analyzed and determined the LED VTC fixtures could output light equivalent to a fluorescent, it was prudent to analyze an optimized solution as it would appear in normal use than to prepare an optimized solution with just the indirect wash fixtures.

The values for this optimization were found to be wallwash at 30%, indirect wash at 20%, and recessed downlights at 10%. The IES guide suggests a maximum luminance ratio of 1.5:1 from the maximum to minimum of the walls behind the participants, or from the faces of participants, to provide quality video feed from the space. The results in Table 5 show the optimized LED solution max-to-min ratios were all around 1.5:1. Table 4 shows the average light level on the table while achieving these proportions was at an acceptable level.

Finally, the predicted versus measured data in Table 6 proves the results of using a videoconferencing fixture layout with control system can be accurately predicted. In this data set, there is an average variation of

10.9% between what was predicted and what was experienced onsite. The difference can be attributed to the slight variation in fixtures, variations in the surfaces within the room, as well as slight changes in the control system adjusting the light levels up and down.

This data confirms the results can be predictably modelled within a reasonable margin of error, making it easier to design VTC room lighting and control prior to obtain the desired results before investing in equipment or time onsite.

**Model and control**

As LED sources become more available and cost effective, lighting designers can be confident they will deliver the performance and flexibility their clients have come to expect from fluorescents. Knowing that LEDs can offer equivalent light levels empowers the client to focus on the intrinsic benefits of an LED solution; namely, energy savings and longer life. Understanding those benefits, it becomes critical to be able to reliably design a solution with confidence and without requiring substantial investment.

The fact that these solutions can be accurately modelled, and the results reliably predicted, is great news for good design and experimentation without requiring investment of time and resources.

Seeing the equivalence between LED sources, understanding the intrinsic benefits, and being able to accurately model and predict performance removes any obstacles for LED solutions, thereby opening the door for them to be used as the new standard for videoconferencing spaces. **EB**

This article is adapted from the technical report "An analysis on the use of LED lighting for videoconferencing" by Jim Yorgey, P.Eng., Frank Neher, Joe Volkert and Christina Katrinak, Lutron Electronics, March 2016. You can access the full technical report at [tinyurl.com/jo4pjvh](http://tinyurl.com/jo4pjvh) (PDF, 215kB).





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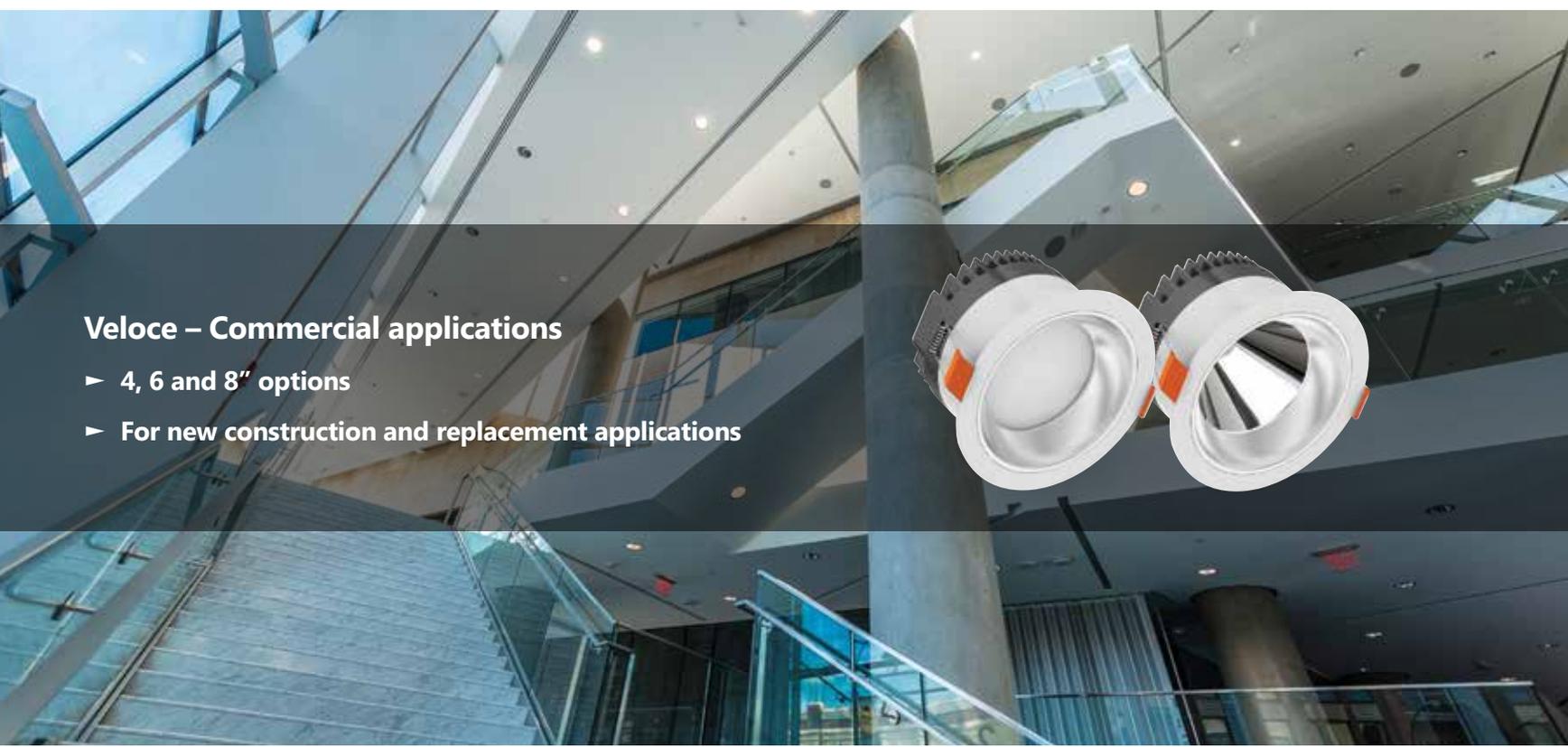
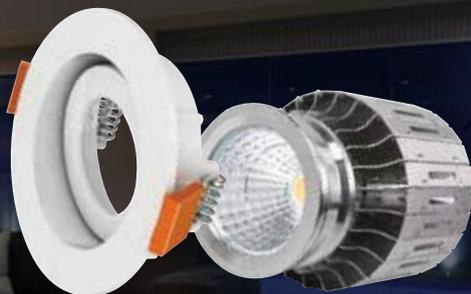
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### Lumeina – Residential applications

- ▶ 6 W (IC rated) and 9 W
- ▶ Reproduces the look of an MR16 halogen lamp
- ▶ Interchangeable trim selection



### Veloce – Commercial applications

- ▶ 4, 6 and 8" options
- ▶ For new construction and replacement applications



## Lighting Solutions that Save. Veloce and Lumeina - LED Downlights

- ▶ Quick and easy installation - no housing required
- ▶ High efficacy
- ▶ Controlled beam
- ▶ Anti-glare reflector design
- ▶ CRI90
- ▶ Dimmable





FLUKE FILE PHOTOS

## CUTTING ARC FLASH ZONE TIME IN HALF WITH WIRELESS TOOLS

**W**orking on live circuits is probably most electricians' least-favourite task but, sometimes, it's the only way to get the job done. A journeyman electrician in the U.S. Midwest found a way to reduce his time in the arc flash zone by turning to wireless measurement tools.

One of Jim's jobs requires taking quarterly voltage and amperage readings at a large data centre, which is always in flux as new computer racks are added and others become obsolete and are decommissioned. Quarterly power surveys let the customer know where power capacity is available for new racks, and which panels are near maximum capacity. Electricians need to take readings on about 9500 individual wires from the subfeeder breaker to the branch circuits.

The data centre is powered by 480V 3-phase power that is fed to roughly 60 power distribution units (PDUs). Transformers convert the 480V power to 120V/208V 3-phase power that is fed to the breaker panels.

Originally, the project required two electricians to suit up



in full PPE before entering the arc flash zone. One used a clamp meter to measure each wire and call out the readings to the his partner, who stood nearby with a laptop and entered the values into the customer's custom spreadsheet template. The job typically took about three weeks.

"A completely full panel requires 42 readings," Jim explains. "We couldn't turn anything off, so we had to suit up completely to meet NFPA 70E PPE requirements. That meant we were trying to communicate verbally while we both were wearing ear plugs and one had a face shield. It made it very difficult to convey the information accurately."

One day, Jim saw an ad for wireless tools. The advertised system consisted of a master

meter that could read measurements wirelessly from a series of current, voltage and temperature modules from several feet away. Within a week, he had checked out the wireless tools at a local distributor, received approval from his boss, and bought a wireless digital multimeter and clamp meter.

(In Jim's case, they were both Fluke tools, forerunners of the Fluke Connect system.)

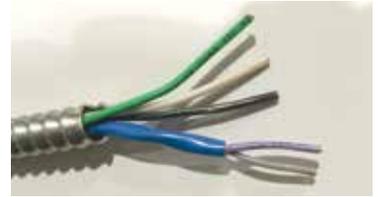
Jim reports the investment turned out to be a great move. Now an apprentice electrician, who's not allowed to be in the arc flash zone, can stand 30-ft away from the test point with the meter that wirelessly receives the readings from the clamp meter that Jim attaches to each wire at the panel. The apprentice then enters the measurement into the spreadsheet.

"Each measurement takes only about three seconds so we get the job done in about eight days compared to 15 days with the previous process," Jim notes. "That means half the time in the arc flash zone, and a savings for our customer." **EB**

— With files from Fluke Corp.

## PRODUCTS and solutions

### Northern Cables' ACIC copper conductor



Northern Cables has launched a power and control cable, Type ACIC, for smart buildings. The cable allows control circuits to be placed in a cable alongside light or power circuits, and is suitable for exposed or concealed wiring in dry locations per CE Code Table 19. According to Northern, the assembly is rated 90C wet or dry, meets cold bend and impact tests at -25C and promises excellent crush resistance.

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

### No powering down with Fluke 368, 369 FC



According to Fluke, its new 368 FC and 369 FC leakage current clamps help industrial electricians and maintenance technicians identify, document, record, and compare leakage current readings. The rugged meters have large diameter jaws (40 mm for the 368 FC and 61 mm for the 369 FC) for work with oversize conductors. The clamp jaws are fully shielded and designed to capture small leakage current signals (as low as 10 µA, according to Fluke).

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

### New trims for Prescolite LiteBox

Prescolite has added two trims to its 5-in. LiteBox surface-mount line (LBSQ5LEDA-square, LBS5LEDA DG-drop



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**TACKLE THE CODE CONUNDRUM IF YOU DARE!**

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

**Compiled by Ontario's Electrical Safety Authority**  
www.esasafe.com

**QUESTION 1**

In a dwelling unit, what is the maximum mounting height to a panelboard's overcurrent device handle (from floor level)?

- a) 100%
- b) 80%
- c) 85%
- d) 70%

**QUESTION 2**

What size of tap conductor is required to connect a metal fence around an outdoor substation to the station ground electrode?

- a) #6 AWG
- b) 2/0 AWG
- c) 3/0 AWG
- d) 4/0 AWG

**QUESTION 3**

When Type CFC system wiring is used, it shall be covered with abrasion-resistant tape and secured to the floor so that all cables, corners and bare conductor ends are completely covered.

- a) True
- b) False

**ANSWERS** Electrical Business, November 2016

**Question 1**

When a service switch is marked for continuous operation at 100% and is supplied by multi-conductor cable, what is the maximum continuous load permitted?

- a) 100%.** Rule 8-104(5).

**Question 2**

What is the minimum size copper bonding conductor that can be secured to the surface on which it is carried (with mechanical protection)?

- b) 6 AWG.** Rule 10-808(5).

**Question 3**

A 5-15R receptacle mounted outdoors at 750mm above finished grade requires a cover plate:

- d) A and B.** Rule 26-702(2).

*How did you do?* **3** • Master Electrician **2** • Journeyman **1** • Apprentice **0** • Plumber?!

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glass). Installing directly to a standard J-box, the 5-in. fixture is an alternative to recessed products in settings where plenum height is challenging or where fire codes restrict the use of recessed fixtures. Prescolite also announced it has added DMX dimming to its LF series LED downlight family.  
**www.prescolite.com**

**FSR upgrades PWB-450**



FSR is expanding its Project Wall Box line (PWB) with the upgraded PWB-450. It mounts in a 4-in. deep wall between the studs in a 16-in. stud bay. Its optional bracketry has also been designed to mount Crestron's larger DM-RMC-4K-SCALER-C 4K receiver/room controller and AMX/SVSi digital interfaces.  
**fsrinc.com**

**RECALL: Flos Skygarden fixtures**

Health Canada is recalling Flos Skygarden halogen pendant light fixtures as the dome can detach and fall unexpectedly.



Skygarden model S1 domes measure about 24 in. in diameter and have a serial number of F6410XXX (the last three digits vary). Skygarden model S2 domes measure about 35 in. in diameter and have a serial number of F6420XXX (the last three digits vary).  
**flos.com**

**Dialight's A0/A1 24-48v system**



Dialight has launched its A0/A1 red controller system, claiming it has the lowest DC power consumption in the industry, making it ideal for operating its Vigilant low (L-810) and medium (L-864) intensity red obstruction lights. The controller and monitoring system lets operators set flash rates at 20, 30 or 40 seconds per minute, as well as a steady-on mode.  
**www.dialight.com**

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# Utility interactive point of connection: Section 64-112

**A**n interactive power production system operates in conjunction with—and can deliver power to—another power system, such as the utility. While this could involve a standard generator, I will focus on renewable energy systems.

A number of concerns arise with the interconnection of renewables. CE Code Section 64 for renewables talks about the utility point of interconnection, and the first Subrule directs us to Section 84.

Section 84 tells us any interconnected system shall be provided with protection against backfeed, equipped to maintain a synchronous condition with the utility, and disconnect all ungrounded conductors in the event the supply authority loses voltage in one or more phases. This requirement must be designed into the system and, as such, most inverters are constructed with power monitoring as part of their function (including backfeed prevention, synchronization, etc.).

The other part of the equation is to ensure the system's safe operation and maintenance. This requires the conductors and equipment—which are energized from both directions—to have overcurrent protective devices (OCPDs) for each source of supply. In a panel, for instance,

the solar feed must provide an OCPD just as the main supply entering the panel has overcurrent protection. When a transformer is added to the mix, the OCPDs must be calculated for each side of the transformer (in accordance with Section 26) by considering first one side, then the other, as the primary.

The system also requires a disconnecting means from the power production source as well as the supply authority. These requirements are a bit generic, as they cover an array of systems and require a level of flexibility. In general, these disconnects must be capable of being energized from both directions, indicate whether they are open or closed, and have verifiable contact operation to the satisfaction of the supply authority. In some instances, these disconnecting means may be fulfilled by the requirements for the OCPDs.

Having the means to isolate equipment fed from both directions is also required. This may be the disconnecting means described above but, due to location or some other nuance, you may require additional disconnects to meet the Rule's intent. Check with your local AHJ before assuming your solution fits the bill for two or more functions.

Now that we're aware of the constraints involved with an interactive system, we can

## CE Code Section 64 for renewables talks about the utility point of interconnection, and the first Subrule directs us to Section 84.

head back to 64-112. The most common installation we are currently seeing is a “utility interactive” connection, where the renewable system feeds into an inverter then connects through the consumers' distribution equipment to the utility in accordance with 64-112(4).

Each panelboard is to be marked to indicate more than one available source, and display a warning that all disconnects must be open to safely de-energize the equipment. The renewable energy breaker shall be positioned at the opposite end of the busbar from the utility supply breaker; a label must be affixed to clearly identify the breaker along with a warning that it is not to be relocated.

Finally, we need to ensure the panelboard bussing does not

carry excessive amounts of current. Some or all of the generated power may be used by the loads supplied by the panelboard.

When the panelboard is on a dwelling unit, then we allow the bussing to be supplied by breakers totalling no more than 125% of the buss' rating. An average 200A single-phase panel has a buss rating of 225A; therefore, the total ampacity of the two breakers supplying the buss shall not exceed 281A.

Dwelling units aside, the same panel can only be supplied by a total breaker ampacity not exceeding 120% of the buss or 270A. This is important, as the dwelling unit is considered a non-continuous load. Remember to check with your AHJ and utility, as they may have other requirements for interactive systems. **EB**

David Pilon has been an electrical inspector with SaskPower since 2000, and is currently the vice-chair of the Canadian Certified Electrical Inspector (CCEI) committee of the International Association of Electrical Inspectors (IAEI), Canadian Section. David can be reached at [dpilon@saskpower.com](mailto:dpilon@saskpower.com).

Always consult your AHJ for more specific interpretations.



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