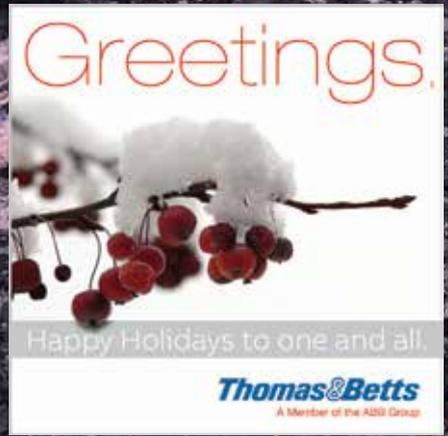


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CANADIAN ELECTRICAL AWARDS 2017

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INSIDE

- + Lights go out in the Good Shepherd Centre
- + Reflections from IEEE PCIC Calgary
- + CE Code 2018 changes

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from the **EDITOR**

ANTHONY CAPKUN

What would you do differently?

This year's Ontario Electrical League conference featured a Contractor Panel, where several contractors took the stage to talk about their experiences and what they've learned over the years and, when asked, answered what they would have done differently.

On that last point, there were two answers that stuck in my mind:

- a) I wish I had joined a business group.
- b) I wish I had entertained my employees' ideas for different avenues of work.

The contractor who mentioned joining a business group wished he had done so when he was starting out, thereby "leap-frogging the mistakes of a novice business owner".

Let's be honest: when you decided to hang your own shingle in electrical contracting, there was likely very little doubt you knew how to do electrical work, but figuring out labour relations, bookkeeping and taxes, profit margin, etc., may have been a struggle.

How many times did you suspect (if not already know) you would lose money on a job? How many times did you think you would lose your house?

These are problems every entrepreneur faces and, unfortunately, too many face them alone, even though there are tons of people in the same boat as you... people who have faced the same hurdles, learned from them and moved forward.

If your business fails, it won't be because of a shortcoming in your workmanship, but in your business acumen. This is where coaches, peer groups and the like play such a vital role. Find ways to tap into that community knowledge to make yourself a better businessperson.

The second point begs the question *Do I have too many eggs in one basket?* Sure, you might have amazing regular clients and consistent work, but what if some of your clients close shop? Or maybe you help your clients install low-voltage devices that no longer require qualified electricians for ongoing maintenance.

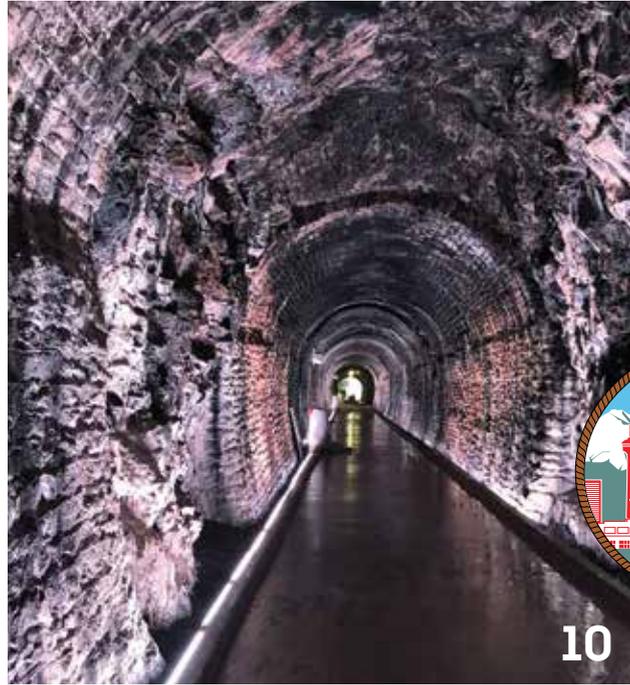
Perhaps your own staff have ideas for new revenue streams. It could mean less *traditional* work for you, but it could also represent opportunities for tomorrow.

So as we close out the year and get ready for 2018, pretend you've been invited to speak as part of a Contractor Panel discussion, and you were asked the question, "What would you do differently?" ... how will you answer? **EB**

acapkun@annexweb.com

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... and come back on better than ever! Through an international competition, the CECA University of Toronto student chapter took on the task of retrofitting the Good Shepherd Centre's lighting to improve the shelter's energy efficiency.

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The largest industry conference for the IEEE Petroleum & Chemical Industry Committee wrapped up in Calgary and, despite the weather-related disasters in the States, attracted some 1435 delegates and 378 guests.

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Advertising for illegal electrical work costs unlicensed contractor \$12,500



Yvon Richer of Orleans, Ont., is now \$12,500 poorer after being convicted in an Ottawa court in August and ordered to pay a \$10,000 fine plus a 25% victim fine surcharge for advertising for electrical work without a licence.

Richer was also convicted in 2014 by the Provincial Offences Court in Ottawa for working without an electrical contractors licence and failing to take out a permit for electrical work. Richer was ordered to pay a \$1000 fine plus a victim fine surcharge on each count.

ESA says it receives hundreds of reports each year about illegal electrical work conducted in Ontario, including reports involving contractors advertising illegally. The agency's says its licensing team has developed an approach to intercept illegal advertising online, including targeted efforts with Kijiji, which has led to two convictions (including Richer), multiple investigations and over 500 warnings issued. Additionally, 70% of advertisements ESA has identified on Kijiji have been removed

Arlington and Bridgeport settle all pending litigation



Arlington Industries Inc. (aifittings.com) and Bridgeport Fittings Inc. (bptfittings.com) have reached an agreement that settles all litigation currently pending

between the companies.

In connection with this settlement, Arlington has received payment of \$1.37 million for the judgment in case No. 3:06-cv-1105 in the Middle District of Pennsylvania against Bridgeport's 3838ASP and 3838SP Whipper-Snap Duplex connectors.

Bridgeport has dismissed its appeal from that judgment and Arlington has dismissed its cross-appeal seeking attorney's fees.

This settlement also resolves Arlington's contempt allegations against Bridgeport in case No. 3:02-cv-00134 in the Middle District of Pennsylvania.

All other terms of the parties' settlement are confidential.

Arlington says this recent payment brings its recovery for violations of its Snap-Tite and Snap2It patents to \$12 million.

BCSA now Technical Safety BC; agency to share info with BC Hydro

"Our new identity will help distinguish us from other regulators as we continue to build awareness, understanding and ownership of safety responsibilities among our clients and stakeholders," said Catherine Roome, president & CEO of Technical Safety BC, formerly BC Safety Authority. The identity change comes "following extensive consultation with clients and industry stakeholders," says the agency.



In other news, BC Hydro and Technical Safety BC entered into an information-sharing agreement, saying this will improve safety and make it easier for customers with electrical service connection requirements to do business. (TSBC says the agreement was endorsed by the Office of the Information and Privacy Commissioner for British Columbia.)

BC Hydro will no longer require you to provide copies of your Technical Safety BC permits on the BC Hydro customer portal or by email. If you use the BC Hydro portal, you can now complete your full connection request online without having to attach documents. Simply provide your TSBC or municipal permit number with the date inspection was passed.

Other BC Hydro and TSBC requirements and processes remain unchanged:

- A valid permit must be taken out with Technical Safety BC, or the applicable municipality. Permits with the old BC Safety Authority name are still valid and part of TSBC's permitting service.
- A BC Hydro Declaration is still required on BC Hydro's customer portal or by email.
- Situations where you are required to provide a copy of the TSBC permit onsite remain the same. This includes reconstructions issued through BC Hydro's trouble centre.

TSBC is now informed when the utility issues a service connection-related order to field crews, and pertinent details regarding the connection request are provided.

More information at EBMag.com, direct link tinyurl.com/ydgb2uta.

ELECTRICAL BUSINESS

November/December 2017
Volume 53 || Issue 10

ELECTRICAL BUSINESS is the #1 Canadian resource for electrical contractors, maintenance & engineering professionals, distributors, manufacturers and their agents, and associated stakeholders.

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Published by Annex Business Media
80 Valleybrook Drive, Toronto, ON M3B 2S9
Tel. 416-442-5600 • Fax 416-442-2230

Printed in Canada
ISSN 0013-4244

Publication Mail Agreement #40065710

Circulation
email: blao@annexbizmedia.com
Tel: 416 442 5600 ext.3552
Fax: 416 510 5168
Mail: 80 Valleybrook Drive, Toronto, ON M3B 2S9

Subscription rates
Canada: Single issue \$7.00
12 issues: \$35.95
USA: \$62.95 (US)
International: \$76.00 (US) per year

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Ontario's Construction Lien Amendment Act passes 2nd reading

Bill 142, the Construction Lien Amendment Act (Ontario), passed second reading with a unanimous vote at Queen's Park, reports Prompt Payment Ontario (PPO). The act now moves to the committee stage for consideration.

"We are looking for support from all parties in making sure this bill passes into law," said Ron Johnson with PPO (ontario-promptpayment.com). "Over 400,000 workers in Ontario's construction sector will benefit from this bill being passed, and Minister Naqvi has shown he supports the sector by ensuring it moves forward quickly."

Bill 142 heralds significant changes to the Ontario legislative framework for construction, including changes to the Construction Lien Act, introducing new prompt payment and adjudication measures.

PPO expects Bill 142 will remain a priority over the next few months, attaining royal assent before the legislature adjourns in December.

Arani places 34th in Profit 500 rankings

Montreal-based LED lighting player Arani (arani.ca) announced it made Profit 500's 2017 ranking, coming in 34th place with 2052% revenue growth over a 5-year period.

"We're just grateful to our customers for their business and support that has helped us grow the way we have," said Sean Arani, president.

For the 29th year, Profit and Canadian Business have identified Canada's Fastest-Growing Companies by ranking applicant firms based on 5-year revenue growth (from 2011 to 2016, or fiscal 2012 to 2017). All eligible companies were independent and Canadian-owned at the end of the 2017 research period.

Edmonton will buy only electric transit buses by 2020

According to a report presented to Edmonton city council's executive committee, the city's goal in switching to electric buses is "to reduce public transit's environmental footprint and fleet maintenance costs, maximize efficient use of resources and taxpayer dollars, and support the modernization of Edmonton's transit infrastructure".

A Negotiated Request for Proposal (NRFP), which aimed to establish a contract



PHOTO COURTESY PROMPT PAYMENT ONTARIO

for the supply and delivery of 40-ft battery electric-powered transit buses and charging systems, was released on June 30. (The deadline for submissions was August 15, and the city is now evaluating proposals.)

The city will place an initial order of five buses and seven charging stations, which will be delivered in 2018 to test performance and compatibility with infrastructure requirements. Under the agreement, the city will obtain up to 40 electric buses, which will be required to operate on nearly all transit routes.

If the initial phase is successful, another 20-25 buses and 35-40 charging stations may be acquired in 2018.

The transition to electric-only buses also requires the electrification of transit facilities. A 10MW primary electric service is needed to support the power requirements of up to 200 electric buses, along with upgraded transmission and distribution, and a new 10MW substation.

Entegrus Powerlines fined \$70,000 after workers injured



Entegrus Powerlines Inc., a Chatham, Ont., electrical utility contractor, has been fined \$70,000 after two workers received electrical burns, reports Ontario's Ministry of Labour.

In August 2016, a six-person crew was changing a switch on a utility pole in Strathroy. The final steps for installing the new switch involved forming thick copper leads that would attach the switch to live 16,000kV powerlines. The safety cover on the lines was removed during this time and not reinstalled.

Additionally, none of the crew members were assigned to act as a dedicated

observer—someone competent in the work being performed who has no other duties but to continuously monitor the situation.

While workers were forming the fifth lead needed to install the switch, the end of the lead made contact with the live powerline. An energy surge went through the lead, switch and utility pole. Two of the workers were in contact with the pole at the time and suffered electrical burns.

Entegrus Powerlines Inc. pleaded guilty to failing to take the reasonable safety precaution of ensuring that a dedicated observer, who was competent in the task being performed, was in place. The court also imposed a 25% victim fine surcharge.

Ontario Electrical League launches Ontario Mechanical League

"This fall we are also officially launching the Ontario Mechanical League," writes Stephen Sell, president of the Ontario Electrical



League (oel.org), in the September 2017 edition of *The Dialogue*. "We would like to welcome our mechanical contractor members to the organization, and we look forward to working with them on industry issues that are affecting them."

"Today, some of our members offer both electrical and mechanical services to their customers. Because of this, and our history, we are already familiar with the mechanical contracting world," writes Cathy Frederickson in *The Dialogue*.

While there are other organizations in Ontario representing the open shop mechanical contractors, writes Cathy, "the OEL, by far, has the largest open shop network and representation at the local level to engage with the mechanical contractors".

The OML is actively recruiting new members involved in plumbing, heating, sheet metal, ventilation, refrigeration or insulation. **EB**

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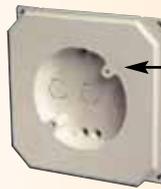
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8413	1-1/4"	1.000	1.460	.870	1.370	2-3, 2-4, 1-3, 1-4, 1/0-3, 1/0-4, 2/0-3, 2/0-4, 3/0-3
8414	1-1/2"	1.360	1.770	1.250	1.590	2/0-4, 3/0-3, 3/0-4, 4/0-3, 4/0-4, 250-3, 250-4
8415	2"	1.700	2.200	1.550	2.050	250-4, 300-4, 350-3, 350-4, 500-3
8416	2-1/2"	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

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

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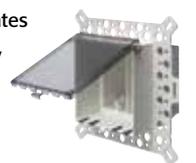
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Schadenfreude... and you thought you had it bad!



The easterly approach shows a view of Airport City and Willy-Brandt-Platz, which is situated right outside the new terminal. PHOTO © GÜNTER WICKER, FLUGHAFEN BERLIN BRANDENBURG

GMBH (SEPTEMBER 2013).

As a construction lawyer, a large part of my practice tends to focus on projects gone wrong. You may be thinking of some of your own projects right now, asking *What the hell went wrong?*

Well, the Germans have a word that may help explain exactly what you may be feeling by the end of this column: *schadenfreude*, which is the pleasure derived from someone else's misfortune. A quick look at the Berlin Brandenburg Airport (BER) construction project should help get you thinking that—whatever your situation—it could be a lot, *lot worse*.

The BER had an original cost estimate of \$2.98 billion CDN; current costs are pegged somewhere near \$8 billion. Construction began in 2006 with an original opening date of October 2011. In fact, 10,000 guests had been invited for the opening, which was to be attended by German Chancellor Angela Merkel... six years later, and the airport is still not open.

The list of reasons for the delays and cost overruns is incomprehensible: for starters, a roof that was almost double the weight

it should have been, automatic doors that would not close during a fire event, parking garages that began to crumble in early 2012, and *missing* luggage conveyors and check-in counters.

Feeling better yet? Here are some more disconcerting facts:

- In 2014, Stern Magazine reported the principal designer of the smoke extraction system and other life safety components—Alfredo di Mauro—was not, in fact, an engineer (despite claiming so on his business cards). He was an engineering draftsman. “No one asked about my university qualifications,” he confirmed on Spreeradio in 2014. “That wasn’t necessary for the work we carried out.”
- Part of the life safety system he designed included funnelling smoke underneath the airport’s walkways in one singular exhaust system, which is counterintuitive, as we all know smoke rises. The revised exhaust system calls for multiple systems controlled by more than 90 km of wiring.

- There are endemic design flaws and deficient construction, including overburdened cable shafts where, in certain instances, phone lines are placed immediately next to high-voltage wiring; approximately 60 km of cooling pipe were installed with no thermal insulation (walls have to be demolished to correct it); insufficient cooling and emergency cutoffs to the entire IT system; incorrectly calculated flight paths and sound protection zones.
- The airport itself is undersized. Initially planned for 27 million passengers annually, BER will have to be expanded as soon as it opens (whenever that is!).

More recent events include:

- In October 2016, it was determined the motors that open/close windows would not operate above 30°C and needed to be changed.
- Sprinkler heads were replaced in late 2016 and early 2017 for increased water flow, but the pipes were too thin to withstand the increased water pressure. This required re-piping.
- With the limited airflow, mould is persistent throughout a building that was closed-in 10 years ago.
- On March 5, 2017, the main transformer station exploded (tinyurl.com/ybm8x8zc).
- Escalators were designed too short. Rather than order and install appropriately-sized escalators, stairs were added to address the shortfall (tinyurl.com/yae6e9rv).

The scope of this article does not permit me to go further but, trust me, there are hundreds of additional errors in design and construction. And you thought *you* had it bad! **EB**



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November 28 • 2 pm EST • To Register, visit EBMag.com/webinars

P.S. Got any horror stories of your own to share? Email EBMag's editor, Anthony Capkun, acapkun@annexweb.com

Dan Leduc is a partner in the law firm Norton Rose Fulbright Canada LLP and practices almost exclusively in construction law. He is frequently called upon to advise and represent owners, engineers, subs, suppliers and builders in front-end services such as contract review, tender issues and general construction matters, as well as in litigation and arbitration. Always willing and able to take on new clients and mandates, Dan can be reached at dan.leduc@nortonrosefulbright.com or 613-867-7171.

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Kudos to 2017's Canadian Electrical Award winners / ANTHONY CAPKUN



Earlier this year, we relaunched our fledgling awards program as the Canadian Electrical Awards to recognize Canadian electrical professionals doing great work across the country—in addition to those paying conspicuous attention to the health & safety of electrical workers.

A special Thank You to I-Gard, who has been committed to electrical safety since 1982 (i-gard.com), and has been a strong supporting sponsor of these awards. Congratulations to you all, and thanks to everyone who took the time to participate!

“I-Gard Corp. is honoured to partner with Electrical Business in congratulating this year’s recipients and, especially, the Electrical Safety Champions, says Andrew Cochran, president. “Through their efforts, perseverance and commitment, they have made a

demonstrable change to workplace electrical safety. By following their example, by sharing their passion and commitment, we can all make a much needed difference.”

We’ll be putting out the call for both Nominations and Sponsors early in the new year, so keep reading Electrical Business Magazine, sign up for our weekly newsletter or follow us on Twitter @EBMag, or visit the awards website, EBMag.com/awards. And if you submitted an entry and didn’t make the cut, don’t despair. Instead, please try again.

Any time you change something, you wonder what kind of response you’re going to get, but I’m pleased to report we received a number of excellent winning nominations across several categories, including two Electrical Safety Champion winners, which you will learn more about below.

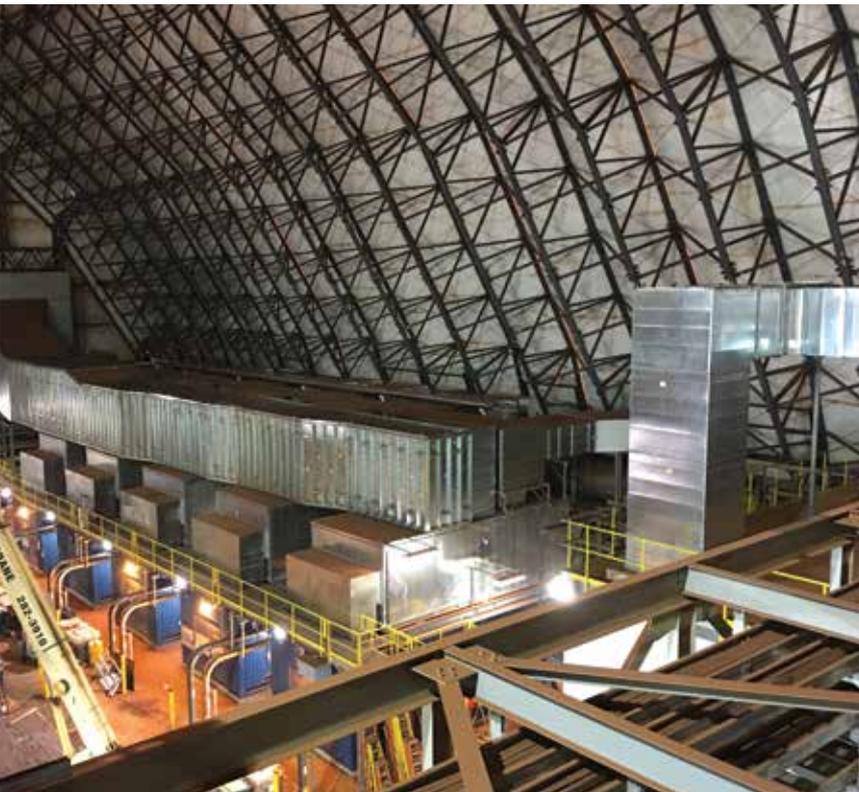


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TATA STEEL CONCENTRATOR MILL

“The electrical installation achieved a productivity measure well beyond industry norms while maintaining an outstanding level of electrical quality across the project.”

CATEGORY: INDUSTRIAL (OVER \$1 MILLION)

Some of the players...

- JSM Electrical Ltd. (contractor)
- Aecom (engineer)
- Tata Steel Minerals Canada (general)
- Schneider Electric Canada (manufacturer)

Why it caught our attention...

The Tata Steel project is a new, 4 MT iron ore concentrator mill located in the remote region of the Labrador Trough—an extensive mineral-rich belt straddling the Labrador and Quebec boundary. Logistical and climatic challenges added to many complexities during construction in this harsh region of Northeastern Canada.

The project is totally self-sufficient, utilizing a five 1.5MVA synchronized



◀ The Skagerrak cable-laying vessel, operated by Nexans.

PHOTO COURTESY EMERANL

SHELL SCOTFORD REFINERY TURNAROUND

CATEGORY: INDUSTRIAL
(OVER \$1 MILLION)

Some of the players...

- Chemco Electrical Contractors (contractor)
- Shell Canada Products (general)

Why it caught our attention...

The 2016 turnaround event included significant electrical direct field labour hours for work such as maintenance inspections, repairs, isolations and, most significantly, electrical installations and commissioning for a 20% de-bottleneck project for the Scotford Refinery in Fort Saskatchewan, Alta., near Edmonton.

The 20% de-bottleneck included the installation and commissioning of new 25kV and 5kV switchgear, 5kV and 600V motor control centres, 5kV motors and variable speed drives, and miscellaneous 600V (and below) loads, including motors, electrical heat trace, etc.

Chemco Electrical Contractors “was a key contributor and contractor for the event, and they delivered their scope safely, on time and on budget,” wrote the nominator, an electrical engineer with Shell Canada Products. The contractor achieved 1 million recordable man-hours injury-free at the Shell Scotford Complex, executing well over 100,000 man-hours of maintenance, installation and project work.

During the event, the owner and contractor worked together closely, holding daily toolbox talks to ensure questions were answered and both groups could get a safe start to the day. Turnaround and project goals were realized thanks to the safe execution Chemco delivered during the event.

For the complexity, immensity, and schedule of the event compared to industry, Chemco delivered the goods with a prominent safety record. In industry, it is recorded that an event of this magnitude has only a 10% chance of succeeding, writes the nominator, “[but it] did, in large part thanks to Chemco and their dedication to safety and Goal Zero”.

generator system. Process equipment is highly automated with large motors powered at 4160V throughout. The project, which involved motor control centres, electrical distribution, lighting, general power, etc., was completed on time and within budget, with over 280,000 hours worked without a lost-time injury.

“The electrical installation achieved a productivity measure well beyond industry norms while maintaining an outstanding level of electrical quality across the project,” writes the nominator, an electrical engineer with Tata Steel.

MARITIME LINK SUBMARINE CABLE

CATEGORY: SPECIAL
(OVER \$1 MILLION)

Some of the players...

- Nexans (manufacturer, distributor, agent)
- Emera Newfoundland & Labrador (general)

Why it caught our attention...

The Maritime Link is a 500MW HVDC project that will transport hydroelectricity from Newfoundland & Labrador to Nova Scotia and other energy markets in Canada and the Northeastern U.S. And, for the first time, The Rock will be connected to the North American grid.

For its part, Nexans designed, manufactured and installed the Mari-

“We delivered to plan without any serious incidents or injuries, despite the almost 600,000 working hours.”

time Link cable connection, saying this is North America’s longest submarine cable. The cables themselves are two, 200kV mass-impregnated HVDC cables—each of which are 170-km long and weigh about 5500 tonnes—installed in water as deep as 470 metres. Nexans also supplied fiber optic elements, transition joints for the sea and land cables, joints and terminations.

The project includes almost 50 km of overland transmission in Nova Scotia and close to 300 km of overland transmission on the island of Newfoundland.

The cables were transported by Nexans’ own special vessel, and are protected on the seabed via trenching, using Nexans’ CapJet system and rock installation. “We delivered to plan without any serious incidents or injuries, despite the almost 600,000 working hours,” added the nominator, a member of Nexans Canada.



Shell Scotford. PHOTO COURTESY CHEMCO.



Ronald A. Bergeron.

**RONALD A. BERGERON,
P.ENG. ME**

**CATEGORY: ELECTRICAL SAFETY
CHAMPION**

Why he caught our attention...

With articles on working safely, fire alarms, arc flash, etc., Ron Bergeron shouldn't be a stranger to readers of Electrical Business, yet there's more to Ron's safety journey than just his published articles.

When Ron purchased Bergeron Electric in 1980, it was a firm of 10 employees. Now, there are 27 staff using 15 vehicles to service a 98% commercial/industrial client base. In those early days, safety was secondary to job completion. No barrier scaffolds or painted ladders, 120V testing was done with your fingers, and so on.

Since then, Ron has been the principal safety leader in his firm, considerably ramping up safety over the years. He has added monthly breakfast safety meetings, and sets the tone by selecting the topics and personally leading the sessions. Guest speakers—such as plant safety, Ministry of Labour and Electrical Safety Authority personnel—are invited.

Over time, Ron developed practical, easy-to-use checklists for vehicles, First Aid kits, voltage gloves, arc flash shields, safety harnesses, ladders and more. All of a worker's equipment is examined by the "fresh eyes" of a fellow worker. He also designed and issued a portable arc flash kit to all tradesmen; for every electrical situation, the workers check their chart for guidance on kit usage. The kit itself has been made simple

and practical, the core of Ron's thrust for safety.

Just as important, Ron shares what he's learned with his fellow contractors.

Ron has been extremely active with Electrical Safety Authority and, when ESA introduced fused leads in 2007, he identified a serious malfunction whereby the heads of the leads would fly off. Between 2000 and 2009, he advised ESA and WSIB that unapproved electrical equipment was rampant in Ontario. His persistence paid off: in 2009, ESA conducted a pilot program with Ministry of Labour inspectors. Of the 16 firms visited, 80% were non-compliant with 125 unapproved items.

**BROCKVILLE RAILWAY
TUNNEL**

**CATEGORY: SPECIAL
(OVER \$1 MILLION)**

Some of the players...

- Ford Electric (contractor)
- City of Brockville (owner)
- Northern Cables Inc. (manufacturer)
- Nedco Ontario (distributor)
- Philips Lighting Canada (manufacturer)

Why it caught our attention...

"This innovative project will re-purpose our Heritage Railway assets for the benefit of recreation, tourism and economic development. Ford Electric did the install and design, with material supplied by Nedco Ontario. Philips Lighting designed the LED lighting that interacts with music and sound to re-create the sensation of trains running through the tunnel in a visually stunning display. And Northern Cables powered the project with Canadian-made power cables!" writes the nominator, a member of Northern Cables.

Canada's First Railway Tunnel was completed in 1860 for the Brockville and Ottawa Railway, later owned by the Canadian Pacific Railway until it was acquired by the City of Brockville in 1983.

A committee of Brockville's City Council has been active since 2011 with the goal of opening the tunnel end-to-end for residents and visitors as part of the Brock Trail system. Renovation construction started August 2016 with

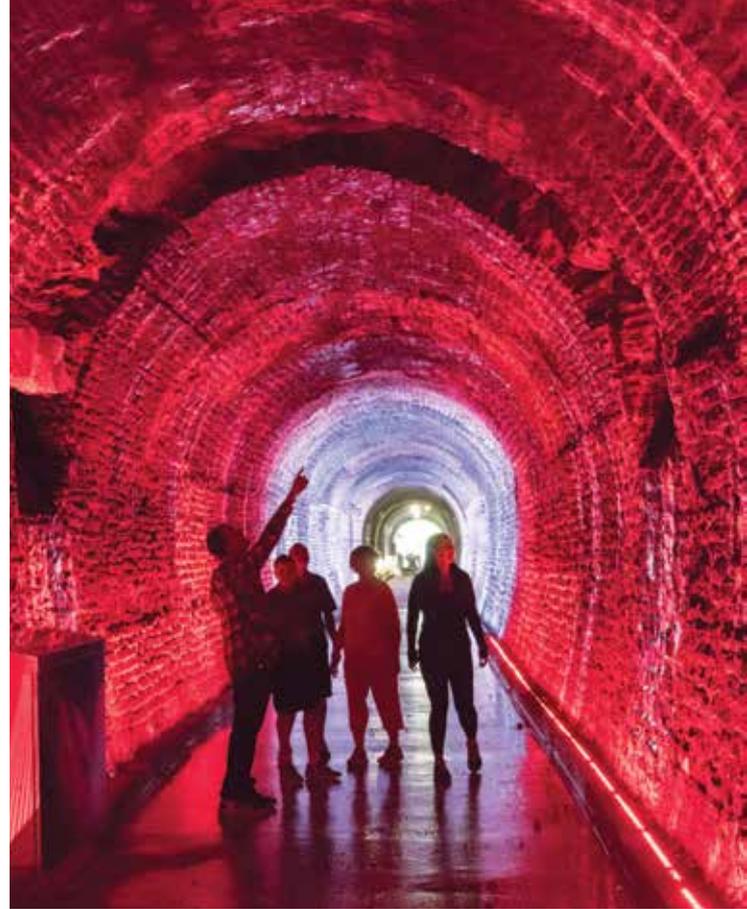


PHOTO COURTESY KEITH HARE, CITY OF BROCKVILLE.

"This innovative project will re-purpose our Heritage Railway assets for the benefit of recreation, tourism and economic development."

opening ceremonies occurring this past summer. At 525 metres, the tunnel now features a smooth concrete travel surface and state-of-the-art energy-efficient LED lighting. Philips Lighting's connected architectural lighting system was selected to illuminate the Brockville Railway Tunnel. More than 700 Color Kinetics ColorGraze Powercore LED fixtures—containing 2800 individually controllable colour nodes—have been used to transform the previously unused railway tunnel into a visually stunning pedestrian walkway that highlights the tunnel's architecture and geology.

Nedco was a supplier to the railway tunnel restoration project. "What an exciting high-profile project our Brockville team was able to be a part of," beamed Gerry Drummond, Nedco Ontario's GM.

"David Bouwers' [Ford Electric] expertise in home automation made him a perfect fit for the integration of the Philips Color Kinetics Lighting system," added Randy Douglas, branch manager, Nedco Brockville. "The entire team at the Nedco Brockville location was also vital to the success of this project by supplying the Philips Lighting package and a variety of other products, including distribution, fasteners, fittings and other accessories."

The tunnel will become the central hub in Brockville for hosting community events and festivals year-round for both visitors and residents, further cementing it as one of the iconic landmarks in the Thousand Island region.

**TERRY BECKER, P.ENG.,
IEEE SENIOR MEMBER,
CESCP**

**CATEGORY: ELECTRICAL SAFETY
CHAMPION**

Why he caught our attention...

“Since before the inception of CSA Z462 and as an employee for Encana Oil & Gas, Terry Becker has been promoting electrical safety,” writes one of Terry’s nominators. “Since leaving Encana and starting [Electrical Safety Program Solutions], he has been 100% driven in making the electrical industry a safer place to work.”

(Note: Danatec Educational Services Inc.—a wholly owned subsidiary of Yardstick Testing & Training—acquired ESPS this past summer. Terry has joined them as senior vice-president, Electrical Safety Division.)

Terry Becker has been actively involved in developing electrical safety standards for 10 years. He is a Certified Electrical Safety Compliance Professional, IEEE Senior Member,

CSA Z462 “Workplace electrical safety” Technical Committee voting member (WG8 Annexes Leader), IEEE P1584 Technical Committee voting member and CSA Z463 “Maintenance of electrical systems” associate member.

Terry has positively influenced industry through direct client work (across Canada and into the U.S.) and by speaking at conferences nationwide and around the world, delivering presentations for CSA Group, IEEE, Alberta’s electrical inspectors, Electrical Contractors Association of Alberta, CANWEA, OH&S industry conferences and workshops, and more.

“Over the course of the past 10 years, Terry has challenged the industry to improve. There is no question that Terry is the most outspoken personality currently in the electrical safety industry,” writes another nominator.

The primary service Terry and his consultancy provides is helping clients develop, implement and manage their own electrical safety programs. It’s fair to say industry is more aware of

“No one who knows him would not accept that [Terry’s] life goal is to make a positive difference in electrical safety for both electrical and non-electrical workers.”



Terry Becker at the Electrical Contractors Association of Alberta 2017 Training Day, Banff 2017.

PHOTO A. CAPKUN.

the importance of an electrical safety program due to Terry’s efforts. His consultancy has provided services, licensed products and training solutions to hundreds of employers across Canada, notes one nominator, adding, “No one who knows him would not accept that [Terry’s] life goal is to make a positive difference in electrical safety for both electrical and non-electrical workers”. **EB**



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◀ Members of the Docherty family and Bob O'Donnell, EVP of the Greater Toronto Electrical Contractors Association, present a cheque for \$30,000 in memory of George Docherty to Br. David Lynch, executive director of Good Shepherd Ministries. PHOTO COURTESY GOODSHEPHERD.CA.

The association's goal in working with a student chapter is "to educate and get information to university students about the electrical contracting industry". In addition to helping students compete in international competitions, CECA has been involved with various courses and seminars—even instituting a Contractor 101 program at UofT.

With regard to the 2015 Green Energy Challenge, Vivian explains CECA helped identify possible recipients and acted "as liaisons between our contractors or mentors that were used in the challenge by the student chapter," because part of the Green Energy Challenge is to partner up with a contractor to help them with the technical aspects of the competition.

Eventually, the students entered the competition with a proposal to carry out a lighting retrofit and install an emergency backup generator, as well as a PV solar panel array, at The Good Shepherd.

LIGHTS GO OUT IN THE GOOD SHEPHERD HOMELESS SHELTER...

... and come back on better than ever!

ELLEN COOLS

3 65 days a year, 95 clean beds, 1371 meals. These are just some of the figures detailing the services The Good Shepherd Centre provides on a daily basis for homeless men and women. These tasks would be pretty difficult to deliver, however, without proper lighting and energy supply.

Enter the Canadian Electrical Contractors Association's University of Toronto student chapter which, through an international competition, took on the task of retrofitting the lighting to improve the energy efficiency of the shelter's 100-year-old building.

The challenge of the Challenge

The 2015 Green Energy Challenge—hosted by Electri International and the National Electrical Contractors Association (U.S.)—brought these

Teams were required to conduct an energy audit of a building or facility on campus or in their community.

organizations together. The competition focused on the "development of a backup power system and resiliency plan for an existing facility with demonstrated critical power needs".

Teams were required to conduct an energy audit of a building or facility on campus or in their community. They then had to submit energy benchmarking and critical load analysis, efficiency upgrades that might reduce critical load demand and introduce a backup power supply/microgrid solution for part or all of the facility.

This was the CECA UofT student chapter's first competition, says Tom Vivian, president of Consult Energy Management Solutions and CECA advisor for the UofT chapter, who says CECA has had a close relationship with the student chapter since its establishment in 2014.

Competition results lead to results

While the students came just shy of being one of three finalists in 2015 (finishing in 4th place), their proposal generated a lot of interest in the community.

In fact, with the help of CECA, Graybar Canada, AllTrade Industrial and IBEW (along with the Greater Toronto Electrical Contractors Association and the Electrical Contractors Association of Ontario), the first phase of the project—the lighting retrofit—came to fruition, and the second phase is underway.

Before carrying out the retrofit, CECA and the students sat down with The Good Shepherd, Graybar Canada and All Trade Industrial to outline their approach. However, CECA and the students were not involved in the project's physical im-

plementation, as the students are not licensed to conduct electrical work.

Graybar (who had already helped the students execute the initial energy audit) and All Trade Industrial came aboard as the distributor and contractor, respectively.

The distributor also worked with the students to create a rebate plan, determining the amount of money The Good Shepherd would receive from municipal, provincial and federal governments for the energy savings.

After the company completed a site audit and did a cost-benefit analysis, Darryl Schell, electrical manager at Graybar and project lead, met with The Good Shepherd to “get the ball rolling” and discuss Graybar’s package, the cost of the lighting retrofit, and the savings driven through the package, he says.

Meantime, All Trade oversaw the removal of the centre’s old lighting fixtures and the installation of new fixtures from Cooper Lighting (Eaton’s Lighting Division) and GE, while IBEW members completed the work. Specifically, over 400 Eaton LED bulbs and fixtures, along with 87 GE LED lamps, were installed, along with motion sensors in some areas.

Lighting retrofit and more

“Not only are the LED bulbs brighter, longer lasting, but safer, too, because they don’t overheat,” said Brother David Lynch of Good Shepherd Ministries.*

The motion sensors were installed in areas that are only used at certain times of the day, such as the dining areas which, for security reasons, used to run their lighting continuously. The result is lower electricity costs and improved security.

AllTrade Industrial faced a few small challenges implementing the lighting retrofit, such as having to work around The Good Shepherd’s operation.

“This meant they couldn’t have a steady flow of work during the construction,” Vivian explains. “So this required some shiftwork, and [they] also needed to ensure that, as old lights were coming out, the new lights [were] installed within a short duration.”

Additionally, part of the UofT students’ goal was to come away with a Net Zero outcome. While unsuccessful, Vivian says “We were able to get close”.

“The cost of the fixtures was \$40,000 at-cost from Graybar, and the Greater Toronto Electrical Contractors Association [...] were able to get involved in this project by giving a donation of \$30,000 in the name of George Docherty, one of their members who had passed away.”

The payback covered the overall net cost of \$10,000 within a few months, he adds.

“The annual energy savings driven by us doing a lighting audit was \$31,926.52,” Schell elaborates. “The hydro rebate given—the cheque that came back from Hydro to The Good Shepherd—was \$13,950. It was an eight-month payback, and a 118% return on investment.”

In the end, he says, “the job ran very smooth, fixtures got decided on in a timely manner, [and] recycling everything worked out”.

Future steps

While the lighting retrofit was a success, the second phase—implementing a generator—has only just begun, and the third phase—installing a PV solar panel array—will not happen.

According to Vivian, the second phase will come to fruition because “the emergency generator is something they [the Good Shepherd] desperately need”.

“If there’s a breakdown of power during their busiest seasons [the holidays], you’re faced with various issues running those kitchens [or] not being able to run them.”

The Greater Toronto Electrical Contractors Association will be in charge of the generator installation. Bob O’Donnell, executive vice-president with GTECA, will lead the project.

Regarding the solar PV array, Vivian says “the incentives for photovoltaic solar panelling right now are not as attractive in Ontario” as they used to be. The benefit from the payback has decreased since the plan was put together in 2015, and it would also take longer for The Good Shepherd to see that payback.

But Vivian and Schell both feel the project has been a resounding success, as the UofT students saw several aspects of their project come to fruition, while The Good Shepherd started saving significantly on its energy bill.



The young engineers (left to right)—Steve Chin, Matheos Tsiaras, Greg Peniuk, Mackenzie de Carle and Jordan Freeman—who, as members of the CECA University of Toronto Student Chapter, developed the plan for energy-efficient improvements to the Good Shepherd Centre. PHOTO COURTESY GOODSHEPHERD.CA.



Brother David Lynch, Executive Director of Good Shepherd Ministries, with members of the Associations which took part in the Green Lighting Retrofit: Garry Fitzpatrick, David Mason, Bob Ritzmann and Jeff Koler.

PHOTO COURTESY GOODSHEPHERD.CA.

“Not only are the LED bulbs brighter, longer lasting, but safer, too, because they don’t overheat.”

It should come as no surprise that the CECA UofT students have continued to enter competitions, finishing as finalists in the 2016 and 2017 Green Energy Challenges.

They also participated in—and won—Electri International’s Student Passport Competition this year, which is “unbelievable,” says Vivian proudly. **EB**

* “U of T engineering students pitch in to make Good Shepherd Centre greener,” Hina Alam, Toronto Star, June 20, 2017.

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REFLECTIONS FROM IEEE PCIC CALGARY 2017

ANTHONY CAPKUN

The largest industry conference for the IEEE Petroleum & Chemical Industry Committee (IEEE-PCIC) has wrapped up in Calgary and, despite the recent weather-related disasters in the States, the event still attracted some 1435 delegates and 378 guests.

That in itself speaks volumes of the international importance of this event to electrical professionals involved in applications technology related to the petroleum and chemical industry. However, the event also drew delegates from outside of those industries because PCIC—like so many IEEE events—is regarded for providing top-quality papers on a variety of relevant subjects aimed at electrical pros.

This was my first time truly attending an IEEE PCIC conference. (I had stopped by the one held in Toronto back in 2011, but just long enough to chat with a few folks.) No, this time I committed several days to absorbing and learning and, now, reporting to you.

Learning tracks

A conference like PCIC is pretty massive. The sessions were arranged along several tracks—Electrochemical, Marine, Production, Refining, Safety—and one simply cannot get to all of them. Thankfully, I've been a card-carrying IEEE member for several years, which is handy, because it gives me access to thousands of



The battery must be designed with a method for expelling gases should something run amok; and, if the design also breaks the circuit while expelling those gases, all the better.

papers. This way, I can always go back and check out all the new knowledge I missed while attending other sessions.

Membership has its privileges. Besides the technical tracks, there were also various subcommittee meetings, tutorials and more. Some of the sessions would appeal to larger audiences because they weren't too specific, like the presentation "Lithium-ion batteries for industrial applications", while others could be laser-focused, like "Deployment of MV drives in electrical submersible pumps in steam assist gravity drainage applications".

Ultimately, there was something for everyone. Here are some the sessions that stood out for me.

Ground current pollution and "Zipse's Law"

Local information can sometimes come from what seems like the most unlikely of places. While listening to Donald Zipse's presentation "History of grounding/earthing practices in the United States", I learned he was involved in a movement in Ontario to pass an act prohibiting "ob-

jectionable current flow" (a.k.a. stray voltage, albeit erroneously). And he's in Wilmington, Delaware!

Bill 161 "An Act to prohibit harmful electrical ground current" explains:

This ground current pollution is a major problem for hospitals, manufacturing plants and farms. On farms, the levels of ground current pollution can become so high that human beings and animals feel electrical shocks. These shocks disrupt the comfort of human beings and animals and can harm their health and adversely affect farm income. Adverse effects can also occur even if there are no shocks.

This issue was also covered by Patrick Lynch in his article "A 'shocking' community pool gets checked for stray voltage", which appears in EBMag December/January, 2009/10. Bill 161 stipulated that:

No electricity provider shall cause an objectionable current flow to occur,

- a) on land or in water that is used by individuals, livestock or wildlife; or*
- b) in buildings occupied by individuals or livestock.*

When I checked the status of this Bill, it had passed First and Second Readings but, for some reason, was "referred to Standing Committee", February 18, 2016. And it looks like it has been there ever since. (I contacted the MP who's been championing Bill





PHOTO: GETTYIMAGES.CA



Photo shows this year's winners of the Myron Zucker Travel Grant with Peter Baen (centre), PCIC chair. The travel grant sponsors up to four co-op/intern students or recent graduates to attend the next PCIC conference. It provides \$600 travel allowance, free hotel registration, free conference registration as a student and one free tutorial.

For all my photos from the Awards Luncheon, visit EBMag.com and click on "News & Articles" then "Photo Gallery".

161 for an update—Rick Nicholls, the MPP for Chatham-Kent-Essex—but I've yet to hear back.)

"The NEC [National Electrical Code] and NESC [National Electrical Safety Code] have rules that are detrimental to humans and dairy cows," Zipse insisted of these U.S. documents (which are not dissimilar to our own).

Zipse would like to see the causes of ground current pollution addressed, which include "antiquated distribution system in some areas, inadequate neutral returns, multiple grounded neutral conductors and poor quality of electricity generated by electronic equipment".

Lithium-ion batteries for industrial applications

"The goal of this paper is not to convince you to go out tomorrow and buy a lithium-ion battery," joked Yves Lavoie of Primax Technologies, but rather to educate delegates on the technology should they ever find themselves in the market for one.

Li-ion is not just one technology but a family of technologies, said Yves, noting there are numerous chemical pairings that produce different results (e.g. longer life versus higher energy density).

There are a couple of issues holding back Li-ion batteries from industrial

applications, Yves explained. The first is the lack of a truly viable 125V system, and the second is perceived safety issues. On that second point, anyone who remembers the Samsung phone battery blow-up era might argue the safety issues are not perceived but pretty damn real.

However, Yves cautions, this is not representative of Li-ion battery tech, but an example of a bad battery design. The battery must be designed with a method for expelling gases should something run amok; and, if the design also breaks the circuit while expelling those gases, all the better.

The little-known IEEE 1683

Apparently, the little-known IEEE 1683 "Guide for motor control centres rated up to and including 600Vac or 1000Vdc with recommendations intended to help reduce electrical hazards" can be counted among the institute's hidden gems. Let's be honest, with a title that long, it can easily be forgotten.

IEEE 1683 is a guide, not a standard, explained the presenters behind the session "Designing and specifying MCCs to reduce hazards and risks by using IEEE 1683". That's because numerous options exist when specifying an MCC, so the guide's authors felt it unwise to fill the document with prescriptive specs, or phrases like "thou shalt".

The authors of the paper behind the presentation—Todd R. Sauve, Richard P. Anderson Jr., Tryton Bower and Kurt R. Mickler—pointed out IEEE 1683 encourages the use of new and not-so-new technologies for maintenance operations, such as remote switch operators or IR camera windows that keep workers from having to open doors during maintenance.

The presenters suggested HRG (high-resistance grounding) for reducing the likelihood of a line-to-ground arc flash, and selectively instantaneous OCPDs (overcurrent protection devices) and zone selective interlocking (ZSI) to help reduce fault clearing times.

Safety just as important... as always

During his presentation "Practical execution of the risk assessment process in electrical safety", EBMag's own "Electrical Safety 360" columnist Mike

I learned he was involved in a movement in Ontario to pass an act prohibiting objectionable current flow.

Doherty argued we don't provide enough clarity to workers, and we don't train our supervisors well enough. "Less-than-adequate job planning is often the root cause of shock and arc flash incidents," said Mike, "but, dig deeper, and you find problems with management," systems and more.

Lucky for readers of Electrical Business Magazine, a lot of Mike's discussion can be found across his regular columns, which you can find at EBMag.com under Safety.

"We will never reduce risk to Level 0," said Daniel Roberts of Schneider Electric, whose presentation followed Mike's, "so we try to achieve a level of risk that is *tolerable*."

During the course of his presentation, "Applying risk assessment at the worker level", Daniel repeatedly drove home the proper definitions of *hazard* and *risk* as understood by the professional health & safety community. Only when we speak the same language, Daniel argues, can true health & safety understanding occur.

To review, a *hazard* is a source of harm. Any kind of harm. A hazard either exists or it does not. Plain and simple. Period. *Risk* is a combination of the *likelihood* and *severity* of that harm. Daniel then explained the two kinds of risk assessment: hazard-based and task-based. CSA Z462 "Workplace electrical safety" focuses on the latter.

Ultimately, we need to "direct workers away from experiential risk assessment to analytical risk assessment," Daniel suggested. This means it's not enough to execute a procedure believing the risk is low simply because that's the way we've always done it and nothing bad has ever happened. No, the decision to go ahead with a procedure in a specific way has to be based on a true analysis of the risks, not guesswork and anecdotes.

Both Mike and Daniel discussed the importance of documented procedures that go into a *managed* health & safety process—which is to be regularly audited—and both touched on

something we'll be covering more in Electrical Business Magazine: human performance issues. These can manifest in a number of ways, ranging from failure or refusal to follow instructions to work errors and so on. And what's going on in the worker's life behind the scenes to cause these issues?

Awards, suites and future dates

When I uploaded my photos from the Awards Luncheon that same evening, I did not include any commentary, but the most important takeaway for me was the notion—reiterated by some of the award recipients—is this: if you want to change things, if you want to improve things, you have to get involved. You have to volunteer for committees, you have to volunteer your time and expertise to standards development.

You have to get involved and *be involved*.

Unlike most other conferences I attend, PCIC does not feature a tradeshow—not even tabletops. Instead, suppliers host "socials" a.k.a. "vendor hospitality rooms", which are "a means of entertaining customers, making and renewing acquaintances, and for commercial discussions on an individual basis".

These socials can be a lot of fun. The hosts might hire bands, magicians or other forms of entertainment, provide you with food and drink and, generally, create a low- to no-pressure atmosphere for chatting about work challenges and successes, getting caught up with your network that you haven't seen in a year or more and, usually, for meeting new resources who can help you with solutions down the road.

Thanks to all of the hosts! To all the new people I met—and to those I already know but was happy to see again (you know who you are)—it was great to meet/see you! And a special thanks to Ernie and Tim, Raed and Tyrone.

Next year's PCIC conference (2018) is being held in Cleveland, Ohio, but the 66th edition returns to Canada in 2019. That PCIC is being hosted in Vancouver, September 9-11. **EB**



Left to right: Tim Wright, VP of Ontario Electrical Construction and brother of John; John Wright, award recipient; John's nephew, Jordan Wright. PHOTO COURTESY ECAO.

This year's recipient of the **Douglas J.B. Wright Award—Electrical Contractors Association of Ontario's** highest accolade—is none other than **John Wright**, son of the man after whom the award was named.

John is a third-generation partner at **Ontario Electrical Construction Co. Ltd.** (OEC) and chair of the board. ECAO and OEC created the Douglas J.B. Wright Award in 1992 to honour individuals who best exemplify

the dedication and commitment to the electrical contracting industry as exhibited by Doug Wright.

John Wright served on the Greater Toronto Electrical Contractors Association (GTECA) board for 16 years, serving as president from 2010-2012. He was a trustee on both IBEW Pension and Health & Welfare Plans from 2000-2014.

He has served on the Local Joint Conference Board, Electrical Trade Bargaining Agency (ETBA), Labour Relations Advisory Committee, Local Area Negotiating Committee, and as director of the Joint Apprenticeship Council (JAC) while with GTECA. John also committed time as a director for Joint Electrical Promotion Plan (JEPP) and as a member of the Human Resources Committee.



David Nathaniel, head of **Standard Products Inc.** (top left), has appointed a new leadership team—**Kelly Hanson, Jason Prevost** and **Daniela Di Pietro**—to run the company so he can "focus on seeking new strategic opportunities for Standard".



Hanson (top right) is Standard's new president, responsible for leading and overseeing business operations. He began his career with Standard in 1994 and possesses over 35 years of experience in the

electrical industry. Prevost (bottom left) becomes executive vice-president. He joined Standard in 2005 and, as EVP, will collaborate with Hanson in managing the overall business, in addition to his direct responsibilities for marketing and quality assurance. Di Pietro (bottom right) becomes EVP Finance, responsible for overseeing and managing corporate finance, accounting, reporting, budgeting and controls. She has been with Standard since March 1995, starting in Accounts Receivable/Payable.

These changes become effective January 1, 2018.



François-Xavier Morin is joining the **Leviton Manufacturing of Canada** team as director, Lighting, where he will be responsible for sales throughout Canada for **ConTech Lighting, Intense Lighting** and **Birchwood Lighting** products. Morin has been in the lighting business for over 20 years, most recently leading LightFX, a national account lighting agency. He is a certified electrical technician and has been a member of **Illuminating Engineering Society (IES)** since 1998, where he is currently serving on the board as a director-at-large. He reports to **Gaby Massabni**, vice-president Distribution. **EB**

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Hone your “Sixth Sense” with FLIR’s meters for electrical pros



FLIR Systems Inc.—whose vision is to be “The World’s Sixth Sense”—unveiled six test & measurement products arriving later this year, including two digital multimeters and a clamp meter featuring FLIR’s infrared guided measurement (IGM). The new products include...

The 18-function DM285 measures temperatures up to 400°C and features onboard storage for measurements and images, as well as wireless connectivity to streamline the inspection process and simplify data collection, sharing and reporting.

The CM275 600A AC/DC clamp meter offers a range of measurement functions, and features a narrow jaw, built-in worklights and a screen that’s more than 40% larger than the previous model.

FLIR says the DM166 is its most affordable digital multimeter and thermal imager combination, featuring “broad multimeter” test functions and the flexibility for use in both high- and low-voltage applications.

The company says IGM guides users without requiring any direct contact with the test site, increasing both speed and user safety. Each product boasts a drop-tested design and carries a 10-year warranty on both the product and the thermal detector.

FYI... FLIR also revealed three new “professional-grade” digital multimeters: the DM91 with data-logging and wireless connectivity for industrial or benchtop work; the DM66,

which offers a range of test features for electrical and field service pros; and the general-purpose DM62 multimeter.

The CM275, DM285, DM166 and DM91 will be available Q4 2017, while the DM62, DM64 and DM66 will be available Q1 2018. flir.ca

Mersen upgrades Surge-Trap Pluggable Series



Mersen has upgraded its Surge-Trap Pluggable (STP) Series of surge-protective devices (SPDs). The new STP series is DIN-rail mountable and improves overvoltage protection for DIN-Rail applications. Featuring a 7kA surge capacity rating, a fail-safe self-protected design, visual indicator, and a small footprint, the product uses Mersen’s TPMOV technology. It also includes optional remote indication and an expanded wire gauge range from 4-14 AWG. MIL-STD-810E vibration tested and UL 1449 4th Edition approved, the new STP series has a high short circuit rating and a thermally protected MOV.

ep-ca.mersen.com

Eaton’s EBMX clamping enclosures

Eaton has launched EBMX enclosures that use clamping technology for hazardous areas to help oil & gas and other industrial customers “enhance safety and improve productivity”. The NEMA 7-classified enclosures are designed to automatically apply even pressure across the



flame path between the cover and body. This design enhances safety by reducing installation errors due to missing or improperly torqued bolts, says Eaton. Designed for motor control devices—including starters, combination-starters, disconnect switches and circuit breakers—the enclosure is rated for 65,000 ampere interrupting capacity (KAIC) at 480V, meets CE Code requirements, and is built to withstand temperatures from -50°C to 60°C.

eatoncanada.ca

Milwaukee Ultimate jobsite and low-profile backpacks



Milwaukee Tool’s Ultimate jobsite backpack is designed for tradesmen who carry a variety of hand tools, power tools and accessories, while the low-profile version is designed for users who perform diagnostic or service work, and carry a tablet or laptop, as well as tools. The new packs are constructed with tear-resistant 1680D ballistic material and metal zippers, and feature load-bearing harnesses, sternum straps to help distribute weight and vertical attachment straps for mounting on the handles of rolling bags and dollies.

milwaukeetool.ca

Extech MG320 insulation tester

Extech’s MG320 20GΩ is a 1000V Cat IV, 600V Cat IV insulation tester with integrated True RMS multimeter suitable for industrial predictive maintenance programs, and is optimized for motors, generators, transformers and other electrical components.



The MG320 offers five test voltages (50V, 100V, 250V, 500V, 1000V) and step voltage in 10% increments from 50% to 120% of range. It features both Polarization Index (PI) and Dielectric Absorption Ratio (DAR) modes, as well as continuity and low-resistance testing with 20kΩ range and zero function.

extech.com

Werner fiberglass 2-in-1 dual purpose ladder



Werner offers several new models of its 2-in-1 dual-purpose Type 1A fiberglass professional-grade ladders. Featuring a flip-and-click mechanism to convert from a stepladder to an extension ladder, the new models are available in 6-ft, 7-ft and 8-ft models that convert to the equivalent of 14-ft, 16-ft and 18-ft extension ladders, respectively. Each ladder also has an integrated V-rung when flipped to extension-ladder mode, as well as oversized, moulded non-marking footpads, and full-sized 3-in. steps.

wernerco.com/ca

Brother PT-E110 labelling tool



Brother Mobile Solutions Inc. has added the PT-E110 industrial hand-held labelling tool to its P-touch Edge family of jobsite solutions. Compatible with HGe and TZe

tapes, the tool comes packaged as a complete kit, featuring large LCD display, QWERTY keyboard, smart font sizing and formatting technology, and a wrist strap. A carrying case, full-length tape and laminated ID labels for cables/wires/fiber, faceplates, network equipment, electrical and control panels, audio visual systems, etc., are also included.

brothermobilesolutions.com

Fluke T6 electrical testers with FieldSense technology



Fluke says its new T6 electrical testers with FieldSense technology can simultaneously measure (not just detect) voltage and current. With the T6-600 and T6-1000, you can measure voltage up to 1000V through the open fork without test leads or exposed conductors, and also take True-RMS measurements in crowded junction boxes or along conductors with inaccessible end points. Featuring "the widest open fork in the industry", the testers can measure 4/0 wires upward, with current up to 200A. The T6-1000 is 1000V Cat III, 600V Cat IV rated, while the T6-600 is rated 1000V Cat III, 600V Cat III. fluke.com

Amerlux SPEQ line of LED track luminaires



Amerlux's SPEQ LED track and surface-mount fixtures feature an integral driver, no visible heat sink or venting, and a snoot for glare control. Three cylindrical models are available: 48W, 3977 lumens; 26W, 2056 lumens; and 15W, 1310 lumens. Colour temperatures include 2200K, 2700K, 3500K and 4000K, with a 90+ CRI and efficacy up to 91. Mounting options include 1-, 2- and 3-circuit systems, busway and canopy. amerlux.com

Litetronics' 4-ft & 8-foot LED strip fixtures



Litetronics' 4-ft and 8-ft LED strip fixtures offer 130-145 lumens per watt (LPW) and a 100,000-hour rated life. The diffuser lens promises uniform light to provide even, low-glare illumination. Available in 24W, 40W and 64W versions and standard, junction box or suspension-mount configurations, the fixtures are offered in a range of colour temperatures, feature 0-10V dimming and are DLC premium-listed. litetronics.com

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TACKLE THE CODE CONUNDRUM IF YOU DARE!

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

Compiled by Ray Yousef, code engineer

Ontario's Electrical Safety Authority • esasafe.com

QUESTION 1

Receptacles are permitted to be mounted facing up in a kitchen counter of an apartment.

- a) True b) False

QUESTION 2

For general power and lighting circuits, the maximum rating of overcurrent protection for a No. 12AWG copper conductor is:

- a) 15A b) 20A c) 25A d) 30A

QUESTION 3

The power supply of a fire alarm system shall be:

- a) Provided by a separate circuit.
- b) Interlocked with the emergency lighting circuit in a hotel.
- c) Kept at least 3.0 m away from any combustible material.
- d) All of the above.

ANSWERS Electrical Business, September 2017

Question 1

Motor disconnecting means shall not be of a type that is electrically operated, either automatically or by remote control.

- a) **True.** Rule 28-602(4).

Question 2

Overhead consumer's service conductors shall not be less than _____ copper wire.

- b) **#10 AWG.** Rule 6-302(4).

Question 3

Where conductors are used in exposed wiring and are subject to corrosive liquids or vapours in a Category 2 location, they shall be of a type with corrosion-resistant protection and be located more than _____ horizontally from floors, decks or stairs.

- b) **1.5 m.** Rule 22-202(1).

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CODE file

DAVID PILON

CE Code 2018 better aligns Section content

The number of changes coming to the 2018 CE Code are fairly substantial, and while a number of them involve tweaked wording and/or definitions, there are also a fair number of what I would call “significant” changes.

One of the reasons behind all of these changes is to better align the CE Code’s Section scopes with the information actually contained in those Sections. This will help mitigate issues with changes occurring in one section of the code but not in another.

Take Section 4 where, at first glance, it appears a number of Rules have been deleted. In fact, a number of Rules involving cords and equipment wires went way beyond the scope of this Section, extending into installation methods and use of these products.

But those are actually Section 12 requirements, which is why these Rules (or parts thereof) have been relocated to the proper Sections. CE Code Rule 4-008 becomes 12-102(3), 4-020 becomes 12-122, while 4-012, 4-018 and 4-040 become Rules 12-400 through 12-406.

In previous columns I explored some of the changes occurring in Section 8 “Circuit loading and demand factors”. The last Section 8 change I want to cover involves calculated loads for service and feeder conductors.

Section 8 is all about calculated loads and demand factors, yet Rules 8-200 through 8-210 refer to the ampacity of the service or feeder conductors. The calculations performed in this Section are to determine the size of loads we are going to be place on the services and feeders for a particular installation, and whether they are continuous or non-continuous.

These calculations are made in watts; as such, our final determination of the load should be expressed in watts. From there, CE Code Rule 8-104 guides us through determining the protection requirements based on Section 14 and the rating and/or type of equipment. We then take that information to Section 4 to determine the conductor type

and size, based on the installation method.

A significant alteration is the rewrite of Section 10, which resulted in the deletion of Rules 10-000 through 10-1108, and the insertion of new Rules 10-000 through 10-708. Although some Rules may have been moved to other Sections, the question “Which rule is that now?” does not apply, as all the Rules are new.

The revitalized Section also includes a number of special terminology definitions to provide clarity on the different terms used in bonding and grounding, and their purposes.

Section 10 now includes a clarification about its objective, and the individual objectives involving different types of grounding and bonding. Section 10’s objective is to establish equipotentiality between the earth and non-current-carrying conductive surfaces. It then expands into the different types of systems and how they are to be grounded, and the objective behind each method, and provides more information on bonding. The revitalized Section also includes a number of special terminology definitions to provide clarity on the different terms used in bonding and grounding, and their purposes.

The CE Code aims to keep abreast of advancements in technology and innovation to help us ensure our electrical installations safeguard people and property. In fact, that’s one of the main reasons

it moved to a 3-year update cycle rather than every 4 years. Be sure to attend any code training in your area to help you stay current with the changes happening in our industry. **EB**

Always consult your AHJ for more specific interpretations.

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.

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Visit nemra.org

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Visit worktruckshow.com

IEEE Electrical Safety, Technical, Maintenance & Projects (ESTMP) Workshop

March 12-14, Calgary, Alta.

Visit sites.ieee.org/estmp/

IEEE Electrical Safety Workshop

March 20-23, Fort Worth, Texas.

Visit electricalsafetyworkshop.com

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Visit emc-mec.ca/ev2018ve

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