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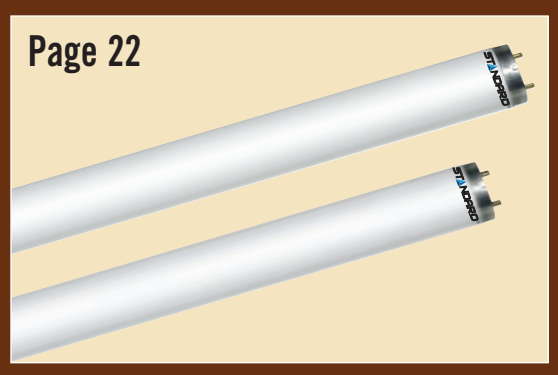
Electrical Business

THE AUTHORITATIVE VOICE OF CANADA'S ELECTRICAL INDUSTRY

Highlights from NETCO's National Training Symposium.



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Electrical Business

THE AUTHORITATIVE VOICE OF CANADA'S ELECTRICAL INDUSTRY

January 2008
Volume 44 • Issue 1

ELECTRICAL BUSINESS is the magazine of the Canadian electrical industry. It reports on the news and publishes articles in a manner that is informative and constructive.

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▼ From the editor

Focus on similarities, not differences

Statistics Canada recently released detailed analyses of data from the 2006 Census on immigration and citizenship, as well as the composition of Canada's language groups, and the information they've uncovered is worth noting—specifically with regard to allophones.

No, allophones are not some weird breed of dinosaur, but rather people whose mother tongue is neither English nor French. This group represents fully one-fifth the population of Canada. The increase in the share of allophones is mainly related to the number of immigrants who arrived in Canada between 2001 and 2006. During this time, an estimated 1,110,000 newcomers settled here, and four out of five of them were allophone.

The 2006 Census enumerated 6,186,950 foreign-born people in Canada, accounting for one in five (19.8%) of the total population—the highest proportion in 75 years. Between 2001 and 2006, Canada's foreign-born population increased by 13.6%, which is four times higher than the growth rate of 3.3% for the Canadian-born population during the same period.

Between 2001 and 2006, language groups from Asia and the Middle East recorded the largest gains, including the Chinese languages, Punjabi and Urdu (Indian Subcontinent), Arabic, Tagalog (The Philippines) and Tamil (Sri Lanka).

In fact, the 2006 Census reaffirmed the position of the Chinese languages as Canada's third-most-common mother tongue group, behind English and French. For the first time, more than one million people—an estimated 1,034,000—reported one of the Chinese languages as their mother tongue. This was an increase of 18.5%, or 162,000, from 2001. In 2006, they accounted for 3.3% of the total population of Canada, up from 2.9% five years earlier.

So what do the numbers mean to you, the electrical professional? For starters, you'll have to come to the realization that, as our current skilled labour heads off into retirement, their replacements may very well come from a far-off country, speaking a language you do not understand. This means that communications (including perhaps "English/French-as-a-Second-Language" courses) could become par for the course in your shop.

Then there's the whole issue of Foreign Credential Recognition, which is something the Construction Sector Council (CSC) is addressing through its "Six-Point Strategy" action plan. In essence, the objective of this strategy is to "facilitate the optimization of foreign-trained workers from arrival in the country to arrival at the construction workplace". Like it or not, we will increasingly come to rely on both foreign-trained skilled labour, and employees we may have a hard time understanding.

Which, in truth, should pose no serious problems for anyone, as Canada was born of immigration and of people who couldn't understand one another, and we've managed thus far.

Keep an open mind, focus on similarities instead of differences, and you'll come out on top. EB

Anthony Capkun

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While the concept of adjusting thermostat setting to achieve energy savings is by no means new, set-back thermostats are of questionable value—and may even be counterproductive—in a home built to R-2000 standards. Researchers from the National Research Council of Canada (NRC) investigate.
Photo courtesy National Research Council of Canada. Photo H. Turner.

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Learn all about what NETCO has produced thus far for the electrical industry, and where it's prepared to go. Various industry players attended this symposium—either as registrant, keynote speaker, or both—and everyone walked away knowing something they didn't when they first signed up. Check out the recap here.

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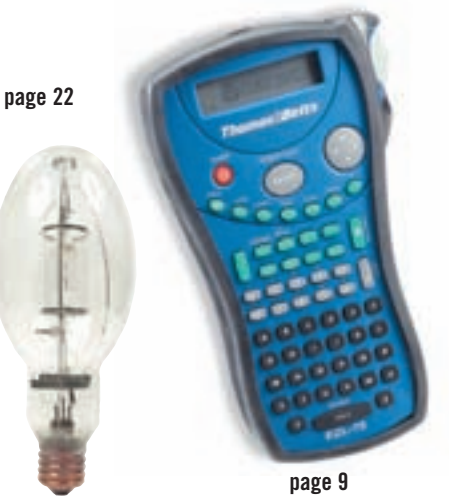

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Gerrie acquires Trade (division of Sonepar)

Gerrie Electric Wholesale Ltd. has acquired the assets of Concord, Ont.-based Trade Electric, a division of Sonepar Canada Inc. Trade is an electrical distributor specializing in the end user and OEM markets.

Gerrie—a Burlington, Ont.-based electrical, automation, datacom and lighting distributor—said it completed the deal to purchase the assets for an undisclosed amount on November 30. Heather Gerrie, president of Gerrie Electric, explained that, when Sonepar Canada decided to sell Trade, "they wanted to ensure that [Trade's] reputation for excellent service would be continued and supported in the future".

"The spirit of being a family owned business has played an important part in the success of our company over the past 50 years. Although Trade Electric was a division of a major global company, they had maintained the long-standing family roots that they had had when they were acquired in 1998 by Sonepar," said Ken Gerrie, chair and CEO of Gerrie Electric.

"The addition of Trade Electric... will have a positive and significant growth impact to our current 17 branch locations and 240 staff," said Elaine Gerrie, COO. "The culture of our company and Trade is very similar and makes this acquisition a good fit for both organizations."

Until recently, Trade primarily served the automation needs of its customers through its locations in Concord and Brampton. With the acquisition, Trade Electric–Division of Gerrie Electric will offer a complete range of electrical and automation products and services for the industrial, OEM, contractor and institution markets.

Hammond acquiring Delta's transformer business assets

Hammond Power Solutions Inc. has signed a definitive agreement with Delta Group xfo Inc. and Delta Transformer of Canada (1999) Ltd. to acquire all of the Delta Group's assets used by, and in connection with, the Delta Group's transformer business.

Delta Group's transformer business is involved in the design and manufacture of standard and custom dry-type distribution and power transformers. Annual sales revenues approximate $40,000,000.

"We are excited about the Delta acquisition, as it offers an opportunity for immediate Canadian market share expansion, provides additional manufacturing capacity and flexibility, as well as supports our business hedging strategies," said Hammond CEO Bill Hammond. "Delta has an excellent reputation in the electrical industry for its engineered-to-order capabilities and quality."

The deal is expected to close mid-January 2008 following receipt of Toronto Stock Exchange approval and completion of due diligence.

Techspan acquires Hayward Components

Frank Dunnigan, president of Techspan Industries Inc., and Chris Hayward, president of Hayward Component Industries (HCI), announced that they have entered into an agreement whereby Techspan will acquire HCI.

"We have been close competitors and now we are joining forces to enhance our value proposition with our electrical and electronic distributor customers across Canada," said Dunnigan. "Adding the HCI product range to the Techspan wire management and control product line will provide our distributors with greater opportunities to serve their markets."

"I look forward to joining Techspan in a sales management role," said Hayward. "Techspan is known for outstanding service and all former HCI customers will certainly benefit from this merger. Since 1981, HCI has serviced the electronic and electrical distributor market throughout Canada. I look forward to broadening our position under the Techspan banner."

Established in 1989, Techspan currently supplies over 15,000 SKUs to more than 1400 distributor outlets across Canada.

Canada's Eaton receives Eaton Corp.'s highest honour

Eaton Corp.'s senior leadership council has awarded the organization's highest award for business excellence amongst its global enterprises—the Eaton Business Excellence (EBE) award—to Eaton's Electrical Group (Canada) for 2007.


Steve Boccadoro

"This year's EBE award winner showed what can happen when you overcome the challenges facing you, and go after the opportunities that will not wait for you," said Sandy Cutler, chair and CEO. "They serve as models for the rest of us in how to deploy EBS (Eaton Business Systems) successfully while doing business right."

Headquartered in Burlington, Ont., the Canadian division operates 10 facilities, a national distribution centre and 26 sales offices across Canada. Its 800 employees manufacture, assemble, engineer, distribute and service a range of equipment and components for electrical distribution and control.

"To be recognized by Eaton as an EBE award recipient is truly a testament to the dedication and commitment of all Eaton employees across Canada," said Steve Boccadoro, vice-president and GM of Eaton's Electrical Group (Canada). "To be chosen from such an elite field of world-class operations within Eaton is a tremendous honour. I thank all of our employees for contributing to this achievement."

Greenlee acquires Paladin Tools

In a move intended to further broaden its position in the VDV channel, Greenlee has acquired Paladin Tools, a provider of tools and accessories for the information transport systems and wiring industries.

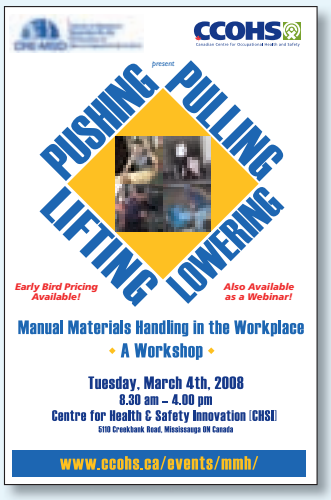
"Strategically, this acquisition provides Greenlee with a complementary brand portfolio and an expanded product line," said Scott Hall, Greenlee president. "Paladin also gives Greenlee access to additional distribution channels in the voice, data and video industry that will broaden our customer base for communications wiring tools."

Headquartered in Oilville, Va., Paladin has been growing its presence in the industry since its founding 30 years ago. Its brand names include Paladin Tools, DataShark and PowerPlay, and product line includes a variety of cutters, strippers, punchdown tools, crimpers, multi-tools, testers, kits and other hand tools and accessories. Current customers include Anixter, Tessco, Graybar, The Home Depot and OEMs (original equipment manufacturers).

"As growth within this industry is expected to continue over the next few years driven by favourable trends in the cable, network and communications equipment field, we look forward to a unified strategy for meeting our customers' needs," said Martha Kness, Greenlee's Hole Making & Hand Tools vice-president and general manager. EB

Networking Luncheon
Ontario Energy Network (OEN)
February 13
Toronto, Ont.
Visit www.ontarioenergynetwork.org and click OEN Events

EB WILL BE THERE!



Pushing, Pulling, Lifting, Lowering: Manual Materials Handling in the Workplace
Canadian Centre for Occupational Health and Safety (CCOHS) and the Centre of Research Expertise for the Prevention of Musculoskeletal Disorders (CRE-MSD)
March 4
Mississauga, Ont.
Visit www.ccohs.ca/events/mmh

University of Industrial Distribution
(In Cooperation with Purdue University)
March 2-5
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Visit www.univid.org

SOLD OUT

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InterNational Electrical Testing Association (NETA)
March 17-20
New Orleans, La.
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Accubid User Conference
April 24-26
Toronto, Ont.
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Annual Electrical Industry Conference
Ontario Electrical League (OEL)
April 30-May 3
Huntsville, Ont.
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MEET (Mechanical Electrical Electronic Technology)
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Skills/Compétences Canada (S/CC)
May 25-28
Calgary, Alta.
Visit www.skillscanada.com

Lightfair 2008
May 26-30
Las Vegas, Nev.
Visit www.lightfair.com

EB WILL BE THERE!

For a more extensive listing, visit **EBMag.com** *and click* **Calendar**

Annual Conference
Supply & Distribution (S&D) Council, EFC
June 4-7
Victoria, B.C.
Visit www.electrofed.com and click Events, then EFC Events

EB WILL BE THERE!

Annual General Meeting
Independent Electrical Distributors (IED)
June 18-20
St. Andrews, N.B.
Visit www.ied.ca/events.html

EB WILL BE THERE!

Industry Conference
Electrical Contractors Association of Ontario (ECAO)
September 6-13
Costa del Sol, Spain
Visit www.ecao.org

The Power Show 2008 (Electric Expo)
Independent Electrical Contractors (IEC)
October 29-November 1
Atlanta, Ga.,
Visit www.ieci.org

EB WILL BE THERE!

Visit learningcentre.csa.ca and click Electrical to find CSA courses on the following subjects near you:

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- 2006 CEC Changes
- Conductors
- Arc Flash: Measures for Prevention and Control
- Motor Installations and High Voltage
- Transformers/Welders
- CEC/NEC: A Comparison of Requirements
- Static, Transient Voltages and Lightning Protection Systems (Fundamentals, Evaluation, Control)


Matt Sonser

Matt Sonser has joined electrical contractor **Walker's Electric 2000** (Midland, Ont.) as production manager. Walker's is a family owned company that has been providing electrical services to industrial, commercial and residential sites since 1935. Sonser served part of his electrical apprenticeship at Walker's in the early 1980s; with nearly 25 years of experience under his belt, he now leads the Walker's team.


Ken Marshall

Ken Marshall has been appointed to industrial and commercial account manager, Western Region, for **Osram Sylvania Ltd.** Based in Edmonton, Alta., he began his new assignment in early December. (The announcement was made by **Hazel Rempel**, director of sales, Western Region–Industrial and Commerical Products.) Marshall assumes responsibility for all sales and business development activities for the industrial and commercial lighting business in Northern Alberta, working directly with both distributors and end users. He's been with Osram for the past 23 years, most recently serving as national account manager.


Bill Stephens

Ideal Industries (Canada) Corp. promoted **Bill Stephens** to the position of Eastern Sales Manager, which extends his sales responsibility to Quebec and the Atlantic Provinces from his existing sales management responsibilities for Ontario. Stephens joined the Ideal Canada Team in 2001 as a key accounts manager then, in 2002, was promoted to Ontario regional sales manager. Meantime, **Rob Ackford** has been promoted to director of marketing and finance, where he's reponsible for marketing, finance, customer service and IT for the Canadian operations. Ackford joined the team in 1999 as director of finance and IT. In 2003, he was also given full responsibility for the customer service department.


Joe Colant

TCP Inc., a light bulb manufacturer, promoted **Joe Colant** to president. Formerly the vice-president of sales and marketing, Colant is now responsible for overall corporate profitability and management of daily business activities within the company's three divisions (including commercial and industrial, retail, and other lighting manufacturers). He will also direct lighting technology research and areas of organic/inorganic growth. EB

PHOTO CONTEST

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

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

Here's how to play

Visit EBMag.com where you'll find an entry form along with a multiple choice answer form. If you've answered correctly, your name will be added to all the other correct entries, from which five (5) winners will be randomly chosen before next month's installment of the "Heritage What Am I?" Photo Contest. Read the small print below for more information. Good luck!

This month's awesome prize was donated by our friends at Irwin Industrial Tool Co. The 25-ft Strait Line tape measure is engineered for all professional applications. It has a 1-in. blade with a 10-ft standout, and a rugged design that withstands jobsite abuse. The Quick-Mark Tip makes it fast and easy to mark measurements on numerous materials. The tape has a dual-sided blade with measurements printed on both sides, and a bright white colour makes it easier to see. The Pro Touch Grip finish allows more control when handling the tape, the Positive Action Toggle Lock makes it fast and easy to lock the tape in place, and the Blade Brake ensures a safe tape retraction.

This month's awesome prize!

Last month's photo: answer

Pictured here is a **DC Shunt** for measuring DC current (patented May 1893). Winner to be announced.

No purchase necessary. Open to residents of Canada of age of majority, excluding Quebec. You must answer a timed skill-testing question to win. Prizes valued at about $21.99 each. The contest is not open to anyone affiliated with, or related to, members of Electrical Business or the Electrical Heritage Society of British Columbia. (That would be unfair.) Complete contest details online at EBMag.com.

By Ron Coleman, B. Comm., FCCA CMC

Role of a project manager

From both applicant and employer perspectives

Here's the deal: I need a project manager for a very exciting project. This is an awesome job paying a gazillion dollars working on one of the most high-profile jobs ever. Why should I hire you?

Don't quit your day job just yet. I ask participants in my workshops to apply for this project manager (PM) position and to list why I should hire them. When they're done, I list their reasons on a flip chart. Here are the usual responses:

- I have lots of experience
- I have great communications skills
- I have technical knowledge
- I work well with teams
- I am reliable
- I, I, I, etc., etc., etc.,

I then turn to the audience and ask them: "Do any of you have too little experience? Do any of you have bad communications skills? Do any of you have poor technical knowledge?" Of course not! But they all say the same thing, listing the same skills as the next guy. What we think sets us apart actually reinforces the notion to prospective or current employers that we are all the same.

This may come as a shock, but your employer doesn't really care about *you*—he cares about what you can do *for him*. So you need to spell out how your skills will get him the results he wants. The first step is to identify those outcomes, and there are usually four outcomes expected of a PM for the job at hand: timely completion; that it's completed within budget, and to the standard specified (no more, no less); and that the relationship with the client is maintained.

To achieve these objectives, the process for identifying the right person for the PM job needs to be followed diligently. An informative source for this approach is the Mechanical Contractors Association of America, which goes something like this:

Resource management

The efficient planning, organizing and scheduling of the following elements: labour; subcontractors; materials; equipment for installation; supplies; tools; 'install only' items; budgets and invoicing; and construction equipment (rental and company-owned).

These are the resources that a PM has to plan, organize and schedule to get the maximum benefit. Remember, "The sum of the parts should be greater than the whole", so using labour, subcontractors and materials in an effective or innovative way can lead to additional cost and time savings.

Liaison activities

This covers the range of people that touch the project, and the PM has to be able to work with each one. They include: project owner and/or his representatives; architects and engineers; cost engineers; workers' compensation/safety managers; 'green' building specialists; inspectors and city/municipal officials; general contractors; mechanical contractors; project management companies; subcontractors and other trades; own labour forces, including foremen; material suppliers; own company's management team, including accounting and estimating; neighbours/local businesses/general public and the media.

Team coordination

The real skill of a good project manager is revealed when he balances resources with liaisons to ensure successful project completion.

Project manager exposed

So what are the skills and make-up of a project manager? Well, a number of things, including: logical thinking; ability to make sound decisions; good communications, which includes good reading and writing, and attention to detail; team leadership; planning and prioritizing, which helps him handle crises; entrepreneurial thinking; some estimating; technical knowledge of a variety of construction systems; and not easily intimidated.

So when you're looking for desirable characteristics in project manager applicants (besides what I've listed above) consider whether they are profit-orientated. Also, can they work in stressful environments, are they persistent and consistent, ethical and prudent? Of course, you should play around with all the requirements I've listed to ensure you end up with a list that's just right for your needs. Then, develop a series of questions and/or tests to help identify how your PM candidates measure up against each of the key points.

Ask open questions about their experiences to help you identify the elements you seek. For example:

- Tell me about some of the projects you've worked on and the challenges you faced.
- How do you recommend handling the handover of the project from the estimator to the project management team?
- What are some of the financial indicators you would use to manage your projects effectively?
- What are some of the non-financial lead indicators you would use throughout the project?
- How do you deal with verbal Change Orders? What would you do were the client to ask you to do work that you believed was outside the scope of the contract?

There's nothing saying you can't give these questions to your candidates in advance to help them prepare for the interview. In truth, this will also show you how they prepare for a project. Keep the four outcomes that you, as employer, want to achieve and make sure you constantly evaluate the candidate on how well he could meet those objectives. Use a points system to score each candidate on how well he responds to each question, as this will help you make an impartial decision later.

Once you have customized this process for your business and for your project manager position, it should be easy to adapt it for other key positions in your company, such as project coordinators, estimators, general managers, etc. Take a leadership role in your business; become a teacher and teach others so that they benefit from your experience. And by documenting this procedure, you create a tool from which many others can benefit. EB

Ron Coleman, B. Comm., FCCA CMC, is a member of the Institute of Certified Management Consultants of British Columbia. A noted speaker, he has completed many interfirm financial comparisons of groups of construction companies in Canada and the United States. Ron's numerous published education programs include a 36-hour business management course specifically designed for ECABC. He is also author of the book, "Your Million Dollar System: How to Increase the Value of Your Construction Business by One Million Dollars in Three Years".

By Oliver Post

You had me at "Hello"

Telephone skills in the Internet age

In a world obsessed with the Internet—where online ordering might seem to threaten the very need for electrical distributors to have an Order Desk—the 130-year-old telephone remains a strong, vital connection to customers.

In fact, one could argue that—with so much standard ordering possible without ever having to speak to anyone—each call to an Order Desk is more critical than ever before; a customer is calling because he needs you to do more than simply take an order.

It's true that not every wholesaler and distributor customer is online, but enough of them are, so it can be a tough transition to go from handling rapid-fire order-taking to engaging in some real fact-finding so you can work with the customer to solve his supply needs. It requires a bit of a change in mindset, but one that is as much about getting back to basics as a new-age approach.

When an inside salesperson is expected to generate a multitude of invoices each and every hour of the day, it is easy to understand how he can fall into some bad habits; ones that can cost sales, to be sure, but that can also translate into higher costs down the road from poor customer service.

One of the key reasons that even experienced inside salespeople can provide less-than-complete customer service stems from the type of training they've received. Those who have had formal training in the duties and functions required of them are in the distinct minority. While most attend training sessions each year, the nature of this training—often focusing on a specific product line of one manufacturer—can leave them wanting when it comes to basic skill sets, such as telephone skills.

A truly effective inside salesperson needs an understanding of much more in terms of basic sales and communications skills, including effectiveness in locating the right supplies.

Think of product knowledge as the power supply and communication skills as the conduit. Now, think about the most experienced inside salesperson you know (let's call him 'The Expert'); he probably knows as much about the products, specifications and jobsite realities as any contractor. But what makes him a great asset to both your company and the contractor is how he is able to provide the right amount of input for any given situation, with the right mix of friendliness and professionalism.

It is also quite likely that The Expert has a loyal group of clients who ask for him by name, probably overloading him with calls from time to time. Watch how he handles the On-Hold situation: When a customer calls, does he say, "Hold please', then hit the dreaded orange Hold button, or does he say, "ABC Supply, Bob speaking, can I put you on Hold?"

The benefit of the former is that The Expert can get back to the original customer, but the problem is that the next caller has been summarily shuffled down the order. The Expert doesn't know whether that caller has an extended order to place, a simple order to review or an inquiry regarding a delivery. The caller could be the most irate contractor in the history of electrical or, who knows, maybe even The Expert's own mother, calling to wish him Happy Birthday.

So here's how a phone call *should go* (along with the amounts of time things should take):

THE EXPERT: Hello, thanks for calling ABC Electrical, Bob speaking. How can I help you?" (5 seconds)

CALLER B: Hi Bob. It's Sam at Aardvark. I have a question about this order you sent. (5 seconds)

THE EXPERT: Sure, Sam. I wonder if I could put on Hold for a second. I have a customer on the other line. Or can I call you back?" (5 seconds)

So far, The Expert has invested just 15 seconds in the call but, all the while, Customer A—who was put on Hold to take this call—has been waiting. To him, 15 seconds can seem like a minute; 30 seconds like a lifetime. That's why The Expert asks whether he can put Caller B, Sam, on Hold or call him back. Or, he could ask Sam whether someone else could help him out.

The key is that is has to be a mutual decision: Sam may not mind waiting for The Expert. He could be sitting at his kitchen table doing nothing else and, because he values The Expert's counsel, he'll wait until The Expert is available. (On the other hand, Sam may be in the middle of a crisis requiring immediate attention.)

Like The Expert, you have to use your judgement. In a case like this, you may have to go back to Caller A and tell him you've got a crisis on your hands and that you'll call him back (though it had better be a pretty big crisis, and Caller A very understanding, before you would do that).

It can be a juggling act at times, *and that's just answering the phone!*

Once you're into the call, it's critical that you maintain the same methodical approach. Back to The Expert and Sam.

CALLER B: Bob, I'm not sure if I understand what's happened to this order. I ordered some junction boxes, six spools of #16, three of #18 and 10 of #14 wire, and my usual wire connectors, but you've sent me a case of different connectors instead, which I think are more expensive. I don't want to pay for them just because the ones I ordered are out of stock. I'm on a budget here you know.

THE EXPERT: Okay, Sam, let me look it up. Oh, I see... you ordered your usual connectors, but with the wire you ordered, it sounded like you would need the ones we sent for the wire combinations you're using. We do have your usual in stock, and they would do if you're only using one #14, but if you're twisting two or more together with any of the other wire you ordered, you'll need to use the ones we sent anyway.

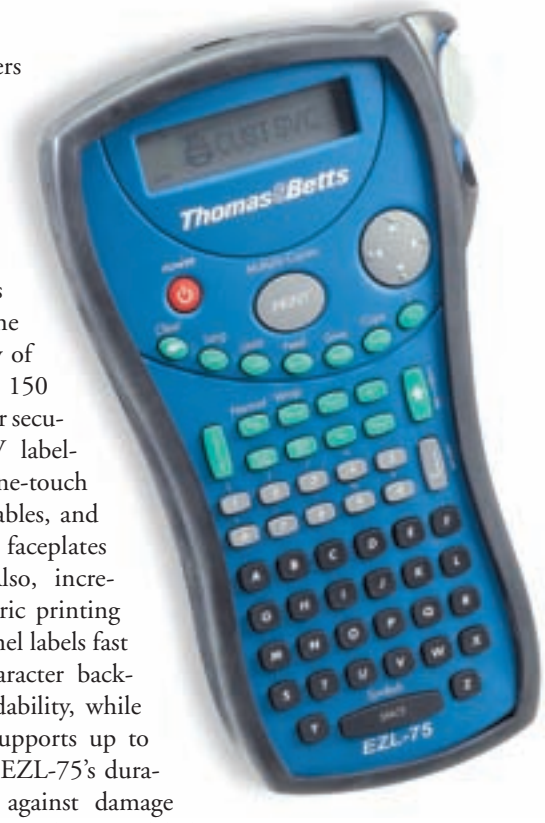
This is a simplistic example, and it would have been better to communicate the change before the order was received, but the point is that the call involved strong product knowledge and a clear explanation. (By the way, it would take about 20 seconds to check the order and communicate the reason for the change. I timed it.) Ultimately, this is the goal of proper telephone communication: to understand what the customer wants and what will help him do his job the best way possible so that you can deliver it.

And it all starts with "Hello".

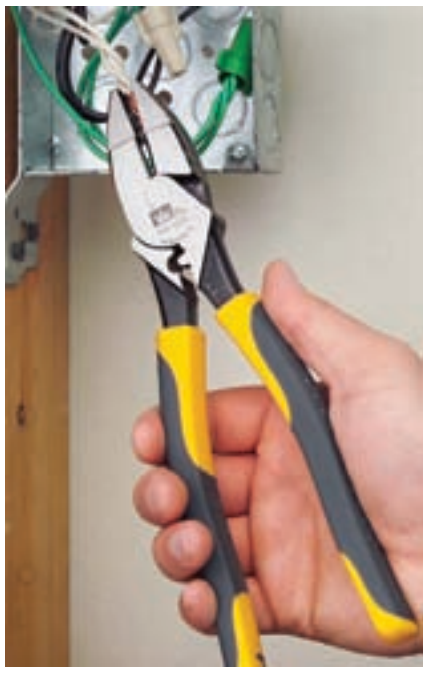
Looking at some new hand tools

Ryobi continues to build its electronic hand tool line with two new AIRgrip tools and a sonic tape measure. First introduced in 2004, the AIRgrip laser level used a patented vacuum technology to affix itself to walls and surfaces without marring them. This year, two new AIRgrip products exploit that same vacuum technology: the **ProCross self-levelling laser level** and **compact laser level**. The self-levelling, three-function laser level provides you with multi-functioning laser capabilities, including horizontal, vertical and intersecting laser beams up to 50 feet in any direction. Other features include a fine adjustment knob that allows horizontal housing rotation of 360 degrees and up to one-inch of vertical change without repositioning, hook-and-loop strap and pins for use on odd surfaces, padded carrying case and tripod adapter. Meantime, the compact laser level features a 30-ft laser line, and vertical and horizontal bubble levels. Finally, the **SonicTape** is a distance and area finder up to 30 feet. It can calculate the area of a room at the push of a button, and boasts a laser point indicator for added accuracy. Measurements are offered in both Imperial and metric units.

Lenox continues to bring handy tools to the market. It recently introduced a utility knife that locks securely Open, yet folds to fit compactly in your front pocket. The **Lenox Locking Tradesman utility knife** has pretty much everything you would want in a utility knife: a compact size, an easy Open/Close locking mechanism and a pushbutton blade release for fast changes. The utility knife boasts some other features that make it handy, like a wire stripper at the base of the blade that can strip 8-ga. and smaller wire. Lenox has also built a multi-tool into the knife's handle that contains a small screw driver, a pipe reamer and bottle opener. The knife was also designed with an integrated belt clip and rubberized grip to provide a convenient and comfortable tool that easily fits in your hand, your pocket or on your belt. It is sold with the Lenox Gold bi-metal utility blade that boasts a titanium nitride coated edge.



Thomas & Betts offers a cost-effective tool for simple labelling. With the **EZL-75 thermal label printer**, you just type and print. Or don't even bother typing: instead, use hot keys to choose from among the EZL-75's built-in library of symbols and more than 150 commonly used words for security, location and VDV labelling. Hot keys provide one-touch flagging for wires and cables, and fixed-length labels for faceplates and security panels. Also, incremental alpha and numeric printing makes printing patch panel labels fast and simple. The 13-character backlit display enhances readability, while multiple line printing supports up to two lines per label. The EZL-75's durable bumper safeguards against damage in the tool box, and it uses the same label cassettes as the EZL-100 (up to 1/2-in. wide). Meantime, there are several label types from which to choose, depending on the application at hand. Flexible nylon tape is suitable for wire and cable wrapping on curved, textured and highly textured surfaces. The permanent polyester is good for general labelling on flat or textured surfaces, while the flexible vinyl resists oil, dirt, grime and solvents on smooth, textured or curved surfaces, indoors or out. Finally, the heat-shrink tape is made of flame-retardant polyolefin with 3:1 shrink ratio for extra protection and insulation of wire and cable.



Ideal has applied its **SmartGrip** handles to classic **Wireman cutting pliers**, claiming they're now more ergonomic and slip resistant, which results in improved tool safety, productivity and comfort—for you. The re-engineered pliers feature sharp, knife-to-knife precision blades that provide control and strength when cutting a variety of wire types. Crosshatched jaws prevent slippage, even while pulling heavily lubed wires, and a built-in crimp die and fishtape puller adds multi-functional value and convenience. Premium quality tool steel extends service life. The SmartGrip handles boast two tiers of Santoprene, which—says Ideal—have proved effective in wicking away perspiration, as well as resisting oils, hydraulic fluids and workshop abrasion. Like all SmartGrip tools, the Wireman's handles have been colour-coded for easier identification inside a crowded tool pouch, and feature FastFinder letter identification on the inside of the handles for quick identification, even by touch. (For those of you who prefer the original dipped-grip for your pliers, Ideal will continue to offer Wireman models in that design.)

Klein Tools recently added its new **QTR-Turn NM cable stripper/cutter** with Klein-Kurve handles to its existing line of strippers and cutters. It employs the company's QTR-Turn technology to quickly remove the outer jacket of non-metallic cable; you simply place the cable in the upper QTR-Turn jacket stripper, squeeze the handle and turn one quarter (90 degrees) to completely sever the outer jacket. The QTR-Turn NM cable stripper/cutter has spring-loaded action for self-opening. The tool strips, cuts and loops 12 AWG and 14 AWG solid wire, and shears 6-32 and 8-32 screws. A serrated nose bends, shapes and pulls wire, while the handles provide a firm grip for better leverage, promising greater control and comfort.

Xuron Corp. has unveiled a new flush cutter designed for rapidly and cleanly cutting cable ties and other soft plastics in a range of applications. The Model 2275 **Quick-Cutter** provides a full cutting capacity along the entire length of the blades to let you cut cable ties fast—especially in tight spaces with limited vision. Featuring the patented Micro-Shear bypass cutting technology that square-cuts cable ties rather than pinching them and leaving spikes, the tool produces flush cuts with a smooth, flat finish. The 2275 is ergonomically designed with soft, rubber-cushioned hand grips, a Light-Touch return spring and no finger loops.

A new, **compact hand crimp tool** that features a locating nest for properly positioning the unisex connector's open barrel ear section to create an 'F' crimp has been introduced by **ETCO Inc**. Designed for use in confined spaces, the ETCO hand crimper (for the company's FlatSnap unisex connector) is a closed-head tool that positions and holds the connector to let you create an F crimp with one hand. The tool has been tested to perform over 50,000 cycles, and provides a parallel stroke that assures an even crimp, as well as ratchet control for completing the crimping cycle.

Technical-vocational education expands in Manitoba

Peter Bjornson, Manitoba's education, citizenship and youth minister, announced the Prairie Rose School Division will receive $300,000 over four years to develop technical-vocational education programs for students in central and southwestern Manitoba public schools.

"Our government is investing in the future by helping rural school divisions increase student access to technical and vocational education opportunities," Bjornson said. "The rapidly-changing market that today's students will enter is seeing increased demand for workers in skilled trades and high-tech professions."

The funding is in addition to an investment of $8.2 million in the Technical Vocational Initiative announced last month and will involve hiring a technical-vocational coordinator to work with four school divisions. The Prairie Rose, Prairie Spirit, Turtle Mountain and Southwest Horizon school divisions will implement and expand career technology studies (CTS) programs. The CTS option has been in place in the Prairie Rose School Division for 11 years and this new project will expand and further develop the program.

Technical Vocational Initiative support to school divisions includes upgrading equipment to ensure high-school graduates are familiar with new technology and standardizing program elements between high school and post-secondary institutions, apprenticeship programs and industry.

Over the past three years, 30 schools in 18 school divisions have shared funding of $1.9 million. Modern equipment has been purchased, dozens of demonstration projects have been completed and a best practices catalogue in technical-vocational education is under development.

The Sunshine Province awards just over $1/4 million to its apprentices

A record 232 apprentices—including a record 30 women and 10 Aboriginal people—have been awarded Alberta Apprenticeship and Industry Training scholarships valued at $1000 each. The annual scholarships recognize apprentices and trainees who have demonstrated excellence in their trade or designated occupation, and encourage them to complete their training programs. The awards are available to all registered Alberta apprentices and trainees.

The scholarship program is funded by contributions from industry and the Alberta government's Access to the Future Fund. The Alberta Apprenticeship and Industry Training Scholarship Endowment Fund now exceeds $4.4 million.

"To receive a scholarship, apprentices and trainees must demonstrate a high standard of academic excellence and distinguish themselves during on-the-job training with their employers. It's a very competitive process," said Brian Bickley, Alberta Apprenticeship and Industry Training Board chair.

Congratulations to these future electrical pros and their employers:

- Aaron Addison (Red Deer), Triple A Electric Ltd.
- Brendon Anderson (Red Deer), Collicutt Energy Services
- Michael Black (Fort McMurray), Ace Construction Co.
- Marcel Bruyere (Calgary), Tarpon Energy Services
- Colwin Cantello (Banff), Henry's Electric
- Dennis Cheng (Calgary), Trotter & Morton
- Joseph Clark (Drumheller), Syntech Enerflex
- Roy Cottle (Calgary), Bow Valley Electrical
- Scott Curran (Edmonton), Commercial Industries Ltd.
- Troy Dooley (Edmonton), Ledcor Group of Companies
- Craig Erichsen (Red Deer), Triple A Electric Ltd.
- Jason Friesen (Brooks), Mario's Electric Ltd.
- Paul Germain (Edmonton), MCL Power Inc.
- Rafal Gruszka (Nisku), Pyramid Corp.
- Nathan Harris-Still (Calgary), Siemens Building Technologies
- Taiotekane Horn (Edmonton), Muth Electrical Management
- Mathew Ibach (Grande Prairie), Atco Electric
- Paul Kniel (Edmonton), TPC International Inc.
- Jeffrey Lehman (Red Deer), Studon Electric & Controls Inc.
- Jennifer Lewis (Medicine Hat), The Electric Co.
- Michael Lundstrom (Rocky Mountain House), Wild Rose Public Schools
- Brian Markley (Edmonton), JH McKenzie Electrical Contractors
- Charlotte Martinoski (Edmonton), Electram Rotary Equipment Ltd.
- Tammy McAllister (Red Deer), Syntech Enerflex
- Shawn McDermid (Sundre), Mer-Mac Electric and Industries
- Brandon McIntyre (Edmonton), ESC Automation
- Timothy McLachlan (Edmonton), Vector Electric and Control
- Coryn McMillan (Calgary), Concept Electric Ltd.
- Timothy Nelson (Calgary), Eurotek Electrical & Data Communications
- Robert Pierson (Calgary), Western Electrical Management
- Troy Rhodes (Lethbridge), Corona Electric
- Tony Robinson (Lac La Biche), Encana Corp.
- Angela Royal (Drumheller), Syntech Enerflex
- Adam Sawchuk (St. Albert), Pro-Ex Trading Co. Inc.
- Colin Simpson (Lethbridge), Tamura Electric
- David Sugawara (Edmonton), Babco Electric & Engineering Ltd.
- Russ Sundsten (Red Deer), Alberta Infrastructure and Transportation
- Dustin Symes (Calgary), Amelco Electric
- Ehi Taranov (Edmonton), Force Electric Ltd.
- Cory Turpie (Calgary), Essential Electric Ltd.
- Dirk Vis (Edmonton), C&A Electrical Ind. (1984)
- Gene Wallis (Red Deer), Studon Electric & Controls
- Matthew Yakulic (Lethbridge), Beltec Power & Control Systems

AREVA wins NB Power contract

Areva NP Canada Ltd. has been awarded a contract to provide New Brunswick Power Nuclear with a containment filtered venting system (CFVS) for the Point Lepreau Generating Station. It will be built in Canada under Areva supervision, to be installed during the Point Lepreau Refurbishment Project.

The CFVS is a back-up safety system designed to mitigate the potential for radiation release for specific accident scenarios that have an extremely low probability of occurrence. It will provide capability for a controlled reduction of containment pressure by means of filtered venting and recirculating the retained airborne activity to the containment building.

This back-up safety system has already been installed by Areva in the majority of the nuclear power plants in Europe, as well as China. Point Lepreau is the first nuclear power plant in Canada to install this feature.

The Soo set to become a solar city

Sault Ste Marie, Ont. (a.k.a. The Soo), is poised to become home to one of the province's largest solar farms, thanks to the latest contracts signed under Ontario's Standard Offer Program (SOP).

Already a significant solar project comprising two 10MW phases when announced in September, plans for The Soo project now include six phases that would contribute 60MW to Ontario's electricity grid. This latest project represents a potential $360-million investment and an important addition to the economy of Sault Ste Marie.

It will join a 60MW project planned in Sarnia, Ont., as one of the largest solar power generating stations planned in Canada. The Ontario Power Authority (OPA) reports that 228 renewable energy projects had been awarded contracts under the SOP as of November 30, 2007. Together with The Soo's announcement, those projects have the potential to generate 882 MW of renewable energy.

Construction workforce strategy to address Alberta's shortages

Alberta construction associations and labour groups have a new set of tools to address workforce challenges. Developed in collaboration with the Alberta government, "A Workforce Strategy for Alberta's Construction Industry" identifies ways to address labour and skills shortages over the next decade.

The collaborative effort brought together more than 15 contributing industry and labour organizations, resulting in the development of actions to ensure an adequate and skilled workforce to meet the growth in Alberta's construction industry.

"Alberta's construction workforce faces an unprecedented demand by the public for schools, hospitals, upgraders, bridges and roads. Ensuring the province has a strong, viable workforce is essential to continued growth—not just in this industry but the economy as a whole," said Ken Gibson, executive director of the Alberta Construction Association.

"The skilled labour shortage is the No. 1 issue facing the residential construction industry," said Mary Kenny, director of skilled labour development for the Canadian Home Builders' Association–Alberta. "Economic growth, competition from other industries, an aging workforce and a lack of young people entering the trades have contributed to a situation where we simply don't have the workers we need. It's imperative that industry join forces to develop opportunities for increased labour development."

Key workforce strategy highlights include:

- Expand opportunities for students to get exposure to, and gain work experience in, Alberta's construction industry.
- Develop a promotional campaign targeted at under-employed Albertans who might be amenable to changing careers and working in the construction trades.
- Advocate for more emphasis on trade skills in Canada's immigration policies and streamline processes for bringing in workers from other countries when shortages of workers with specific trades skills are widely recognized.
- Continue to advocate for improved processes for credential and competence recognition for out-of-province/country workers seeking employment in Alberta's construction industry to improve labour mobility.
- Continue efforts to promote workplace health and safety best practices and identify new approaches to further reduce work-related injuries in the construction industry.
- Develop mentoring programs to support women, Aboriginal peoples and other under-represented groups in the construction industry.

Some of the organizations responsible for implementing the strategy include:

- Alberta Building Trades Council of Unions
- Alberta Construction Association
- Alberta Roadbuilders & Heavy Construction Association
- Canadian Home Builders' Association–Alberta
- Christian Labour Association of Canada
- Construction Labour Relations–Alberta
- Construction Owners Association of Alberta
- Merit Contractors Association

Alberta doles out apprenticeship scholarships

Registered Apprenticeship Program (RAP) scholarships have been awarded to 384 Alberta high school graduates participating in the program. "RAP scholarships are a great way to encourage students to transition into post-secondary learning from high school," said Doug Horner, minister of advanced education and technology. "Award recipients are recognized for their hard work and provided support to continue on in their apprenticeship programs as they shift into the next stage in their lives."

The Alberta government partners with industry to fund the annual $1000 scholarships. Students can start in RAP as early as Grade 10. Their work earns them on-the-job training hours toward an apprenticeship, along with credit toward their high school diplomas. When the apprentices graduate from high school and start their first period of in-class training, they are eligible to receive $700 of the scholarship. They receive the remaining $300 when they start their second period of in-class training.

"I'm pleased to see industry and government continuing to support Alberta's young apprentices," said Brian Bickley, Alberta Apprenticeship and Industry Training Board chair. "RAP scholarships are another excellent way to promote the trades in Alberta, as more and more young people explore these challenging, hands-on careers."

Congratulations to the following up-and-coming electrical apprentices:

- Kyle Bauer (Wetaskiwin)
- Christopher Bell (St. Albert)
- Daniel Bilyk (Vegreville)
- Anthony Bourque (Edmonton)
- Chad Boyce (Edmonton)
- Dylan Brewster (Rimbey)
- Garrett Cannan (Mundare)
- Michael Charuk (Vegreville)
- Robert Clark (Sherwood Park)
- Michael Croft (Calgary)
- Ryan Deary (Calgary)
- Thomas Dul (Sherwood Park)
- Calvin M. Foster (Lacombe)
- William Gaugler (Hotchkiss)
- Ryan Gemmell (Calgary)
- Jayden Hachey (Drayton Valley)
- Brittney Hammond (Beaverlodge)
- Tanner Hanasyk (Thorhild)
- Brennan Haycock (Edmonton)
- Nicholas Hudgins (Stony Plain)
- Shawn Hutton (Ardrossan)
- Matthew Jenner (Airdrie)
- Tyler Jensen (Drumheller)
- Peter Klanten (Olds)
- Kevin Koustrup (Drumheller)
- Christopher Kowalewski (Calgary)
- Justin Kreutz (Sylvan Lake)
- Christopher Krushel (Medicine Hat)
- Brian Kuhn (Edmonton)
- Jordan MacKay (Irma)
- Tyler Martin (Medicine Hat)
- Timothy Massey (Edmonton)
- Justin McDiarmid (Red Deer)
- Jay Mitchel (Strathmore)
- Rory J. Neall (Sherwood Park)
- Kyle Ness (Lougheed)
- Kurtis Peters (La Crete)
- Jeff Porozni (Vegreville)
- Reese Roth (Cold Lake)
- Mark Sauchenko (Grande Prairie)
- Tyson Schatschneider (Wetaskiwin)
- Mikeal Schempp (Hussar)
- Jonathan Shephard (Medicine Hat)
- Eric Soderberg (Lacombe)
- Corey Steele (Bonnyville)
- Steven Stenson (Forestburg)
- Jeremy Urlacher (Cold Lake)
- Jonathon Wong (Clive)

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Osram lights Banff with LED streetlights

The town of Banff, Alta., has joined forces with Osram Opto Semiconductors in launching a pilot project to convert its streetlighting to LED; eight streetlights have been upgraded to LED lighting with the goal of reducing energy consumption by 36%. The LED streetlights' fixture design and directional nature also adhere to one of Banff's environmental priorities: to help preserve and protect the night-time environment (including views of the night sky).

The goals of the project are to gather performance data and track energy consumption information during variable weather and lighting conditions to identify permanent future solutions.

Albertans set winter power demand record

At 6 o'clock in the evening of Monday, December 3, Alberta's demand for electricity reached an all-time high of 9701 megawatts, breaking last year's record of 9661 MW set on November 28, 2006.

"The heaviest demand for electricity in Alberta typically occurs during the winter," said Warren Frost, Alberta Electric System Operator (AESO) vice-president of operations and reliability. "A prolonged cold snap, reduced daylight hours and increased lighting are all factors that combine to push demand to record levels."

Electricity consumption in Alberta has grown by 28% since 2000, with a year-over-year load growth of 4.7%. AESO estimates an additional 5000 MW of electricity by 2017 and 11,500 MW by 2027 will be required to meet the growing electricity demands of Albertans.

Priorities set for 2010 National Model Codes

In developing the 2010 National Model Codes, the Canadian Commission on Building and Fire Codes (CCBFC) has identified priorities presenting what it calls "complex technical challenges". One of the priorities affect Part 9 of the National Building Code of Canada (NBC), entitled "Housing and Small Buildings", and deals with secondary suites in residential buildings.

The Standing Committee on Housing and Small Buildings has formed a task group to evaluate the requirements that currently apply to buildings with not more than two dwelling units and will recommend revisions, if needed, to address secondary suites. Secondary suites are smaller suites often retrofitted into existing single-family dwellings. They are sometimes referred to as "accessory apartments" or "in-law suites". A number of provincial codes and municipal jurisdictions have requirements that apply to these suites, but there is little consistency from one jurisdiction to another.

The task group plans to review the requirements currently provided in provincial codes in their consideration of a possible reduction in requirements or the development of alternative solutions for secondary suites. Among the issues the task group will address are **egress and exiting, fire detection and electrical safety**. The group plans to provide a report with recommendations to the parent standing committee by the spring. EB

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Canadian Centre for Housing Technology Twin Test Homes NRC's Twin Test Homes are fully finished, 2100-sf four-bedroom houses that are used to test the latest innovative housing devices. Devices are tested in the one on the left while the other is used as an experimental control. The homes are highly automated, and each has 'virtual families' that wash, cook and open doors. Photo courtesy National Research Council of Canada. Photo Harry Turner.

Are thermostat set-back and set-up valid energy-saving options?

Testing twin R-2000 homes for the answer

Regularly lowering the temperature on a thermostat overnight or while away from home to conserve energy is a common habit among Canadians. In 1994, over 70% of us claimed to practise this habit, while only a small portion (16%) claimed to own a programmable thermostat (p-stat). With p-stats comes the ability to program different strategies for additional savings in summer and winter.

The concept of adjusting thermostat setting to achieve energy savings is by no means new, and the use of thermostat set-back in energy-efficient houses has also been explored. In a 1988 paper, however, researchers suggest that set-back thermostats are of *questionable value*—and may even be counterproductive—in a home built to R-2000 standards.

So with p-stats and energy-efficient houses becoming more prevalent, side-by-side testing was deemed necessary to determine whether a p-stat offers any substantial savings to a homeowner with an efficient house, and whether these savings come at a cost of discomfort to the homeowner or risk of damage to the home through repeated envelope surface condensation.

During the winter heating season of 2002-2003 and the summer cooling season of 2003, the Canadian Centre for Housing Technology (CCHT) ran a series of trials to determine *actual energy savings* from thermostat setting in one of its R-2000 test houses. The unique nature of the CCHT Twin House Facility allowed not only the examination of energy savings, but also whole house performance. These twin, two-storey R-2000 houses feature a simulated occupancy program and are fully instrumented with over 300 sensors. (EB visited this facility several years ago. It's amazing the experiments they can carry out and measure.)

During the thermostat experiments, important factors affecting occupant comfort were explored, including: air temperature recovery time from set-back and set-up; house surface temperatures during winter set-back; solar effects; and summer house humidity. A side-by-side testing approach was used. Following an initial period of benchmarking, different thermostat strategies were deployed in one of the houses, referred to as the 'Test House'. The second house, referred to as the 'Reference House', remained at a control setting of 22°C without winter set-back or summer set-up.

Three different set-back temperature strategies were deployed in the Test House during winter testing. During summer testing, two different temperature strategies were tested. The first strategy employed a 3°C daytime set-up, while the second was simply a higher temperature setting: 24°C, 24 hours/day.

A single, centrally located programmable thermostat, featuring conventional recovery (system activation at the time of temperature setting change), controlled both the space heating and cooling systems. Features of the thermostat included: a 2°C nominal deadband, and a cycle rate of 3 cycles/hr when at the 50% load condition.

What did they learn?

During the winter, measured savings from the CCHT experiments were slightly lower than the Energy Star savings calculator for p-stats, which assumes a 5.4% per degree Celsius of setback. A dual seven-hour setback of 4°C produced a seasonal savings of 10% on furnace gas consumption, while a dual seven-hour setback of 6°C produced a seasonal savings of 13%. Apart from the shorter duration of setbacks, 7 hours instead of 8 hours, the airtightness, insulation, and passive solar design of the R-2000 house may have contributed to the difference in measured savings.

The results from the winter set-back experiments highlight the need for the use of 'optimum start'—where the thermostat anticipates the house's response and begins heating in advance to meet the desired temperature setting at the proper time. This was not a feature of the p-stats tested at CCHT (though it is a requirement on newer Energy Star models). The two-hour recovery time on cold days could easily be anticipated by this control strategy, increasing occupant comfort in the early evening. However, the optimum start time strategy would cause the house to spend less time at the set-back temperature, resulting in reduced savings from those recorded in this experiment.

Furnace size is a contributing factor to recovery time, and the ones used in this experiment were oversized. Although a smaller-

Table 1
Energy Star acceptable setpoint times and temperature settings (2005)

Setting	Time	Setpoint temperature	
		Heat	*Cool*
Wake	6 a.m.	21°C	26°C
Day	8 a.m.	17°C	29°C
Evening	6 p.m.	21°C	26°C
Sleep	10 p.m.	17°C	28°C

Table 2
CCHT research house specifications

Construction standard • R-2000 **Liveable area** • 2260 sf, two storeys **Insulation** • Attic: RSI 8.6 (R-49) • Walls: RSI 3.5 (R-20) • Rim joists: RSI 3.5 (R-20) **Basement** • Poured concrete, full basement. • Floor: concrete slab, no insulation. • Walls: RSI 3.5 (R-20) in a framed wall. No vapour barrier.	**Garage** • Two-car, recessed into the floor plan; isolated control room in the garage. **Exposed floor over the garage** • RSI 4.4 (R-25) with heated/cooled plenum air space between insulation and subfloor. **Windows** • Area: 377 sf total, 174 sf South-facing. • Double-glazed, high solar heat gain coating (on surface 3). • Insulated spacer, argon-filled, with argon concentration measured to 95%.	**Air barrier system** • Exterior, taped fiberboard sheathing with laminated weather resistant barrier. • Taped penetrations, including windows. **Airtightness** • 1.5 air changes per hour @ 1 lb/sf **Furnishing** • Unfurnished

sized furnace could heat the house effectively at a constant setpoint, it would experience more difficulty recovering from set-back temperatures, resulting in longer recovery times. Were the furnace size an exact match to the highest heating load, it would be unable to fully recover from the added load of the thermostat set-back on the coldest days of winter.

Throughout both the summer and winter trials, the furnace operated in continuous circulation. This is the house's standard mode of operation, and is required to provide outdoor air via the HRV (heat recovery ventilator) in the highly airtight R-2000 construction. In a house with 'looser' construction, the furnace could be operated in 'automatic' mode, allowing outdoor air to be obtained from natural ventilation, without the 84% efficient heat exchange of the HRV.

In this type of operation, one would expect a quicker response of the house to a set-back or set-up—looser construction allowing for faster heat transfer between indoors and outdoors. More savings from thermostat set-back would be expected in these looser homes, particularly during warm winter weather with an average outdoor temperature above 4°C (where savings in the R-2000 Test House were negligible). Additionally, a slower recovery time would be expected for the same reasons—the furnace (or air-conditioner) having to run longer to combat the larger heat gains (or losses) to regain the original thermostat setting.

Thus, the house would spend more time at the set-back or set-up conditions, resulting in larger savings. Continuous circulation, in addition to circulating outdoor air from the HRV, also helps to distribute heat in the house. Without continuous circulation, an increase in stratification would occur, creating potential for even lower surface temperatures during setback.

Both summer thermostat strategies were accompanied by advantages and disadvantages. The energy savings from the set-up strategy were offset by long recovery times. Even with a thermostat equipped with pre-comfort recovery, it would have to start its recovery roughly half-way through the set-up period to return to the set temperature on hot days. This recovery time could be reduced slightly by eliminating air-conditioner cycling as it approaches the setpoint. However, without controlled cycling, the system would be more likely to overshoot the setpoint temperature, providing unnecessary excess cooling and adversely affecting comfort.

Long recovery times from summer set-up are mainly attributable to A/C sizing. Although the two-ton air-conditioner was effective at maintaining the house at a constant set temperature even on the hottest days, it was ineffective at recovering from a 3°C set-up, let alone a 4°C set-up as pre-programmed into Energy Star thermostats. Central air-conditioners are often sized to just meet the design cooling load calculated, as was the CCHT air-conditioner. An additional drawback to the set-up strategy is the resulting peak in energy use late in the evening, something utilities are trying hard to minimize. For these reasons, the set-up thermostat strategy many not be the best energy saving strategy for summer.

The summer higher-temperature setting results in larger savings than the set-up, and also eliminates this evening peak by maintaining the house temperature throughout the day. However, the issue of comfort is raised. Not only is the temperature in the house higher than ideally desired, but the humidity levels are also slightly increased because of reduced air-conditioner operation.

They're not all that

Despite the energy efficiency of the R-2000 Test House, thermostat set-back strategies provided up to 13% seasonal savings in furnace gas consumption and 2.3% seasonal savings in furnace electrical consumption during the winter. The highest energy savings occurred for the lowest set-back temperature (16°C) on the days with the highest heating loads.

On warmer winter days, savings from thermostat set-back were negligible, as the R-2000 home maintained its temperature despite the thermostat setting. On most occasions, recovery times from thermostat set-back were less than one hour, reaching a maximum of 2.25 hours on the coldest test day. Generally, thermostat set-back proved to be an effective and inexpensive energy-saving strategy in an energy-efficient home.

Two summer thermostat strategies were examined: a daytime temperature set-up and a higher temperature setting 24 hours/day. Air-conditioner and furnace electrical savings from the set-up strategy were highly dependent on weather (days with low solar gains producing minimal savings). For the entire cooling season, savings of 11% could be expected. The set-up strategy also suffered from long recovery times, surpassing seven hours on the hottest days. Proper implementation of a set-up strategy would require larger sizing of the air-conditioning unit to reduce these recovery times. Even then, the set-up strategy would be adding to the peak electrical load experienced in the evening by utilities.

Air-conditioner and furnace electrical savings were more than twice as high for the higher temperature setting strategy (23% for the entire cooling season). The downside to the higher temperature setting is occupancy comfort. Not only is the temperature higher, but indoor humidity increases due to less frequent air-conditioner operation, decreasing comfort levels and increasing perceived heat. Thermostat strategies are likely not the best alternative when used on their own for reducing summer energy use.

Utimately, this study shows us that while programmable thermostats do save homeowners some money, they should not be the only energy-saving strategy considered, especially in what researchers call 'loose' homes. Not everyone has an R-2000 home, so there are plenty of opportunities to explore other energy-saving strategies with clients. The better informed they are of programmable thermostats benefits and limitations, the more inclined they'll be to listen to advice on additional opportunities. EB

This article is based on a research paper published by NRC's Institute for Research in Construction (IRC) entitled "The effects of thermostat set-back and set-up on seasonal energy consumption, surface temperatures and recovery times at the CCHT Twin House Facility", authored by Manning, M.M.; Swinton, M.C.; Szadkowski, F.; Gusdorf, J.; Ruest, K. (March 2007). The Canadian Centre for Housing Technology (CCHT) is jointly operated by the National Research Council of Canada (NRC), Natural Resources Canada (NRCan) and Canada Mortgage and Housing Corp. (CMHC).

Connecting Canada's electrical industry

NETCO National Training Symposium highlights

By Anthony Capkun

Friday evenings' cocktails were hosted by Greenlee's Rob Bentley. In the photo, left to right, are: ECAO's manager of human resources, Susan Boorman; CECA's executive secretary, Eryl Roberts; and Local 120's (London, Ont.) Virginia Pohler.

One of the highlights of Session 3 (Train-the-Trainer: Test-Taking Strategies for Red Seal Electrical Exams) was meeting CSA's Bob Nelson, the mastermind behind the ESAT (Electrician's Self-Assessment Tool) CD-ROM.

In her session "Interview Techniques for Selecting Apprentices", Cheryl Crumb argued that we shouldn't place much importance on resumes. "They serve to list the basic things the candidate must have. Beyond that, they tell you nothing of the individual [and] let's face it: an electrical apprentice won't consider resume-writing an Essential Skill."

Described as "a 'dedicated' resort-style conference facility", The Kempenfelt Centre in Barrie, Ont., is an intimate—albeit motley—collection on buildings of the shores of Kempenfelt Bay, Lake Simcoe. Despite all the new construction in Barrie—especially residential subdivisions—the centre remains neatly tucked away in near isolation from the hustle and bustle of daily concerns.

Which was perfect, actually, because this venue served as Ground Zero for NETCO's 2007 National Training Symposium in early November; a two-day event (three, actually, if you count Friday night's 'meet-and-greet') focusing on promoting education and training, and continuous learning, for Canada's electrical professionals. If the symposium were to be neatly and tidily summed up, I would have to say it was all about two things: professional development and networking—both of which go neatly hand in hand.

Friday evenings' cocktails—hosted by Rob Bentley and sponsored by Greenlee—were a great icebreaker, as attendees from across the country had the opportunity to meet one another and swap "war stories" from their respective neck of the woods. In fact, just about every province and territory was represented, with folks from Nova Scotia, New Brunswick, Newfoundland & Labrador, Ontario, British Columbia, Saskatchewan, Manitoba, Alberta and Quebec. There was even someone from Maryland, Rick Hecklinger, though he was one of the keynote speakers.

First, a bit of history

NETCO is a joint labour-management partnership between IBEW (First District, Canada) and the Canadian Electrical Contractors Association (CECA). It was brought online in 2006, but flows from "A National Labour Market Study of the Electrical Trade" (1997) conducted by CECA and the IBEW, which recommended the creation of a joint, national vehicle to enhance industry-specific efforts in building and maintaining a skilled workforce, and in capturing new and emerging markets.

Let's be honest: on the surface, this entity seems like a "Union Members Only" club, but I'm assured it's not, because CECA has a "Check your hat at the door" policy... meaning any electrical professional is entitled to participate. In fact, CECA's position was clearly communicated to me when I interviewed its president, Rick Brodhurst, back in April 2007. He explained CECA is an "association of associations", and that while provincial ECAs (electrical contractor associations) tend to have union members only, CECA membership is open to both union and non-union contractors.

Saturday morning

The symposium officially kicked off Saturday morning with greetings from both Eryl Roberts, executive secretary of the Canadian Electrical Contractors Association (CECA) and Phil Flemming, IBEW's (First District, Canada) international vice-president. In his greeting, Roberts outlined the problem electrical educators across the country share and, by default, highlighted NETCO's raison d'être: "Across the country, you are all doing things in your JACs, but you're doing them in isolation. You have no way of sharing best practices".

In his opening remarks, Flemming pointed out that NETCO is not about seeking power over JACs, "but we do seek influence". In essence, NETCO aims to become the clearing house—the disseminator—of electrical best practices for all Canada.

Then Carol MacLeod (an admitted PowerPoint junkie) took the stage. Her firm specializes in developing HR strategies and learning solutions to help a variety of clients in various industries manage workplace change, and she's been involved with NETCO since its inception. She explained some of the things NETCO has been working on, such as the National Occupational Standards posters for the three Red Seal-recognized electrical trades (see EB June/July 07, page 14, for an example), Best Practices for JACs, and Test-Taking Strategies for Interprovincial Red Seal Electrical Exams.

"NETCO is concerned about the Pass/Fail rates, and feels it could be of help here," she explained, adding that trades training starts with apprenticeship, "but definitely continues after someone gets their C of Q." MacLeod also discussed the Essential Skills as described under the National Occupational Standards, of which there are nine. Of those, "Reading Text, Numeracy and

NETCO
NATIONAL ELECTRICAL TRADE COUNCIL

Get over the idea that only children should spend their time in study. Be a student so long as you still have something to learn, and this will mean all your life.

— Henry L. Doherty

Phil Flemming, IBEW's (First District, Canada) international vice-president (at right), sits in on Session 1, "Construction Sector Council Workshop on Plain Language", delivered by Julia Lew—a Workplace Educator for SkillPlan (BC Construction Industry Skills Improvement Council). Lew is the lead author for the Construction Sector Council's "Plain Language for Construction".

Ray Matthews, the provincial director of training, Electrical Industry Education Trust Fund of Alberta, discussed how his outfit, despite having three brick-and-mortar facilities, invested in video conferencing. His group also successfully tackled the issue of off-site training by investing about $1 million in a trailer that can visit folks in work camps.

Problem-Solving (Thinking Skills) are the three most important predictors of success in the trade," she added.

Rosemary Sparks, the director of operations for the Construction Sector Council (CSC) took the stage to discuss her organization's work in creating a Construction Supervisor National Standard. "The construction supervisor," she explained, "is among the oldest age groups in the trades," which is why it's imperative to CSC that a suitable standard be developed.

The problem, Sparks notes, is that a construction supervisor "is usually a good tradesman who shows leadership skills and is taken from the ranks. At that point, they're typically not given any formal or informal training [for their new role]". As such, CSC wants your input for full validation of the Construction Supervisor NOA (National Occupational Analysis). To participate, visit www.csc-ca.org.

Cynthia Waugh, manager, trades and apprenticeship with Human Resources and Social Development Canada (HRSDC) came to the symposium to talk about the Apprenticeship Incentive Grant (AID). "While the number of apprentices in Canada is rising, completions remain flat," she noted. "Also, apprentices tend to be 25 years [of age] or older, and have already tried something else before choosing an apprenticeship."

Waugh covered some of the things introduced in Budget 2006 that encourage more apprenticeship training, such as the Apprenticeship Job Creation Tax Credit (AJCTC) and Tradesperson's Tool Deduction (which were nicely explained by EB's resident business expert, Ron Coleman, in the March 2007 edition of EB's free e-newsletter, E-Line). One additional item introduced in Budget 2006 that speaks directly to apprentices—and that Waugh came specifically to talk about—is the AIG.

Delivered by Service Canada (servicecanada.gc.ca), it's a taxable cash grant of $1000 per year available to registered apprentices once they have successfully completed their first or second year/level of an apprenticeship program in one of the Red Seal trades. It is meant to help cover some of the tuition, travel and tool costs, and encourage apprentices to complete their program and get their Red Seal, which will allow them to apply their skills and knowledge anywhere in Canada.

So here's the issue: the grant is there, the money is there, but not enough people know about it! Waugh really encouraged everyone at the symposium to increase awareness of the AIG so that they receive more applicants. In a couple of months (April 4, to be exact) it will be the one-year anniversary of Monte Solberg, HRSDC's minister, presenting the first $1000 AIG cheques. Let's all make sure that, while this program exists, we take advantage of it as best—and as often—as we can!

The highlight of Saturday afternoon was the "Pan-Canadian Look at Best Practices in Action"—essentially, a talk show format where training leaders from across the country took the mike to discuss their successes and challenges. Ray Matthews, the pro-

vincial director of training, Electrical Industry Education Trust Fund of Alberta, discussed how his outfit, despite having three brick-and-mortar facilities, invested in video conferencing "so we can broadcast from one location to another". The technology is not perfect, though, as Matthews admits there are some speed issues, but they "mainly use it for meetings so we don't have to fly people back and forth". Matthews' group also successfully tackled the issue of off-site training by investing about $1 million in a trailer that can visit folks in work camps.

Rick Lousier, Local 2085's training and education coordinator in Manitoba, had some sobering concerns in his part of the world. "We have trouble getting people out for training," he admits, "because they're just so busy, and with the Aboriginal Outreach Program, we didn't have the mentoring program we were assured we would have." At the same time, Lousier concedes, there's no point in having a training program "if you don't have any jobs for them... you just become a broken promise".

Fern Tardiff, chair of Local 625's JATC in Nova Scotia, explained his group tracks apprentices' training to make sure they're getting good exposure. And they listen to their contractors. "[They] were telling us they were getting too many apprentices who have never set foot on a construction site [so now] the apprentices need a pre-apprenticeship period to gain some practical experience."

In this session, led by Carol MacLeod, participants learned how to deliver NETCO's curriculum on Test-Taking Strategies for Red Seal Electrical Exams and options for integrating it into ongoing technical training programs. MacLeod is NETCO's project consultant and the designer of NETCO's Test-Taking Strategies curriculum.

In the photo are (left to right): CECA's executive secretary, Eryl Roberts; Scott Murray, ex-StatsCan statistician, now president of DataAngel Policy Research Inc.; and Jerry Wilson, IBEW (First District, Canada) international representative. Murray's presentation "Human Capital Development: Key Issues and Challenges Facing the Construction Industry" was somewhat bleak, to say the least, but they say that knowledge is power, so in that regard he did a great job of preparing us for the world to come.

And all this happened Saturday morning before breaking for lunch! There was more to come.

Saturday afternoon

After lunch, registrants attended one of three afternoon seminars: 1) Construction Sector Council Workshop on Plain Language; 2) Interview Techniques for Selecting Apprentices; and 3) Train-the-Trainer: Test-Taking Strategies for Red Seal Electrical Exams.

For my part, I tried popping in and out of sessions to get a feel for all of them. One of the highlights of Session 3 was meeting CSA's Bob Nelson, the mastermind behind an interactive CD that helps you train for your C of Q. Known as ESAT (Electrician's Self-Assessment Tool), it helps you get through the pressure of preparing for the final C of Q exam by putting you through the paces with more than 1100 sample questions covering each block, task and subtask in the HRSDC Occupational Analysis for the Construction Electrician. Available for purchase on CSA's website (www.csa.ca), the CD is based on CE Code 2006–Part I to match current exam coverage.

In Seminar 1, Julia Lew (a workplace educator for SkillPlan), walked her group through a number of examples of excessively wordy and confusing messages, and showed them how to clean up the text so that the message comes through loud and clear. After all, in many industries—especially construction—you want everyone to understand policies, warning, dangers, etc. perfectly. At the start of her session, she explained three Tips to consider before committing a message to paper: 1) Organize the information; 2) Make it short; and 3) Be clear.

Finally, Session 2's Cheryl Crumb explained the nuances of interviewing, particularly as it relates to interviewing a potential apprentice candidate, or apprentice for your company. (However, these techniques can apply to anyone, anywhere). Like onions, people have many layers, and Crumb identified the three layers with which interviewers should be concerned. Level 1 just scratches the surface; our gut reaction to a person. It's superficial and what Crumb calls "dating behaviour". When you get down to Level 2 of a person, that's where you learn about their credentials; their technical abilities. However, this is already on the person's resume, so why waste time with that at the interview?

No, Crumb suggests we must drill down to the final layer, Level 3, of a person, to learn about their attitude and job beliefs, as this is the level that ultimately decides what kind of person we're bringing on board, and whether or not we'll be happy with them. "We must learn to ask Level 3 questions from the outset," Crumb says, arguing that we shouldn't place much importance on resumes. "They serve to list the basic things the candidate must have. Beyond that, they tell you nothing of the individual [and] let's face it: an electrical apprentice won't consider resume-writing an Essential Skill." She summarizes: "Our challenge is to ask the questions that reveal behaviours".

Sunday morning

The NETCO Symposium didn't fool around with our time, as Sunday morning again featured a line-up of prominent speakers.

Sandie Birkhead-Kirk of the CCDA (Canadian Council of Directors of Apprenticeship) talked about her organization and how it fits into the Canadian skilled labour landscape. This is the group behind the whole Red Seal program, and one of things she admitted was that CCDA recognizes that it needs "more input and transparency" with the examination process. However, CCDA is moving forward. In 2005, explained Birkhead-Kirk, it adopted a change in its mandate to include research.

So, some time this year, we should expect the completion of the National Apprentice Survey (NAS). Some other projects that should be complete (or near completion) include Apprenticeship Technical Training Models and the 1993 Registered Apprentices Cohort Study (we'll keep you posted).

There was one more presentation that really bears examination: "Human Capital Development: Key Issues and Challenges Facing the Construction Industry" by Scott Murray (an ex-StatsCan numbers-cruncher, now president of DataAngel Policy Research Inc.). This presentation really opened many of our eyes to the past, current and future state of both skilled trades and Canadians' employability on the global scene. Something Murray referred to as 'The Undeclared War'—that is, on our livelihoods and the standard of living we enjoy in Canada.

Murray argued, and says the numbers prove him out, that the skilled trades create greater wealth for a society "than rocket scientists". But the real purpose behind his talk was to explain how the world is changing, and that if we don't adapt quickly, "we're in deep shit". One of the problems in Canada is that "we're not having enough babies"; not enough kids are coming through the education system to fill market requirements for skilled labour. Our second problem (opportunity) is globalization of goods and services. "For the firms that can muster the things that they need to compete internationally, this offers huge opportunity, huge economies of scale," he said, without having to say what would happen to the firm that cannot muster in the face of globalization.

The market for all of the key inputs has also globalized, so no matter where you're located, everyone is gaining the same access to technology, capital, etc. So all things being equal, argued Murray, your success will come from your people. Another problem that Murray threw into the mix is the fact that "multinationals are willing and able (even overnight)" to move their operations to the lowest-cost regions of the world. As such, job losses are inevitable in Canada. However, what remains to be seen—and it becomes a matter of public policy, says Murray—is whether laid-off Canadians will be able to find similar, well-paying replacement jobs.

"The ringer in this 'undeclared war' is that other countries are gaining ground in education and training," said Murray, explaining that when people in Bangladesh, for example, achieve the same levels of skill and education as their Canadian counterparts—and possess the same access to information technologies—they'll be able to compete directly against us on costs alone. In essence, Canada won't stand a chance. Pretty doom and gloom.

Suffice to say, the NETCO Symposium really drove home the idea of how much we all need to pool our resources to ensure the success of all. Unless we all work toward the common goal of being the best in the world (that's right... not just Canada, but the world), we may have to start practising telling people what it's like not to live in a First World country. EB

A warning about implementing NFPA 70E

By Dave Smith

Electricians have been doing live work since Edison lit up Menlo Park in 1879. Should a contractor tell his client there will have to be a production stoppage for what has traditionally been an accepted live task, it's very likely the client will merely find another contractor.

NFPA 70E is an American standard for electrical safety in the workplace and is being adopted across Canada and internationally. (CSA is developing a Canadian equivalent, CSA Z462, which is scheduled for completion this year.) Disparate provinces are adopting NFPA 70E at different speeds and in different ways; some provincial legislation refers to protecting workers from flashover or arc flash while other legislation speaks to protecting workers from recognized hazards.

NFPA 70E is designed to protect workers in two significant ways:

1. by restricting live work to testing, troubleshooting, adjustments and data gathering only, and;
2. by suiting up workers in voltage-rated and flame-resistant PPE that is equal to the maximum voltage and arc flash hazard when working on or around exposed, energized equipment.

The first point is a huge change, as the ultimate goal is to eliminate live work altogether. Other than electricians, few people are really aware of how much work in Canadian industry is done live so as not to interfere with production. Many articles on the subject reference an American Occupational Safety and Health Administration statement, which says financial considerations are an unacceptable reason for performing live electrical work. While an admirable position, it's largely impractical; with the electrical design of many facilities, the entire production process would have to be stopped (unless the work could be scheduled to coincide with a production stoppage, but this would be difficult in a 24/7 facility).

Especially hard hit will be electrical contractors. Electricians have been doing live work since Edison lit up Menlo Park in 1879. Should a contractor tell his client there will have to be a production stoppage for what has traditionally been an accepted live task, it's very likely the client will merely find another contractor.

As an electrician and an electrical safety consultant—as well as the father of an electrician—I am in complete support of NFPA's initiative. At the same time, psychologist Abraham Maslow's research into the Hierarchy of Human Needs clearly shows that fighting for our livelihoods is almost a primal instinct, and doing a traditional job live because you are a small contractor feeding your family, or expecting someone else to because you need to keep your job, is going to continue.

Implementing NFPA 70E carries an enormous cost to owners and shareholders, but it's mainly a one-time cost. When it is done, we'll have much safer facilities and work practices leading to fewer accidents, injuries and misery.

A simplistic solution would be to follow NFPA 70E's second point—that of suiting up workers in voltage-rated and flame-resistant PPE—thereby enabling electrical workers to continue to do certain tasks both live and safely. Let's examine that option.

Pages 29-31 of NFPA 70E contain eight sections that list typical tasks an electrical worker has traditionally done live and the PPE required were live work to continue. The columns list the individual task, the Hazard/Risk Category of that task (from which the required flame-resistant PPE can be selected), and whether or not voltage-rated (insulated) gloves/tools are required.

For example, the top section on page 29 identifies work done on "Panelboards rated 240V and below". One task identified in this section is "Remove/install a circuit breaker". The electrician in this case would need to wear FR PPE suitable for Hazard/Risk Category 1, which is a maximum 4-cal exposure.

It would seem straightforward, then, to adopt NFPA 70E, provide FR PPE to your workers and have them use the tables when doing live work. What prevents you, however, are Notes 1, 2, 4 and 5 at the bottom of page 31, which restrict the use of these Tables within the parameters of each Note. For instance, Note 1 restricts the above task to a panel of no more than 25,000 amps of available short circuit current (SCC) that is protected by a fuse or breaker with a maximum of two cycles fault clearing time.

Who is going to know this SCC information? If you're a plant maintenance electrician, you should be able to determine this information for the panel you're working on, but if you're an electrical contractor working for a variety of clients, *good luck!* And if the panel is fed from a pole top or locked vault transformer, you might have to wait weeks for a utility worker to climb the pole or open the vault so you can locate the needed transformer and fuse data information.

It is highly unlikely you will ever have more than 25kA available on a 240V panel, but if you don't know, then you cannot use NFPA 70E's table. As for the clearing time, who would know that off-hand? Fuses and moulded-case circuit breakers should open in less than two cycles, but an air circuit breaker will not. Were the panel in the downtown core of a major city, supplied from a network of transformers, the clearing time would be the time it takes for the fault to burn itself open.

Practically, 240V systems do represent a lower arc flash hazard, but should a worker perform any task—including testing, troubleshooting, adjustments and data-gathering—without knowing this data, he could be in violation of the standard. Were an accident to happen, he and his company would be in violation of federal and provincial safety standards.

Should the task location exceed the Note limitations of 1, 2, 4 or 5, then Article 130.7(C)(9)(a), top left of page 29, says that an arc flash hazard (AFH) analysis is required—an engineering study requiring the completion of a short circuit study, followed by a protective device study. The results are used to determine the incident energy in cals/cm^2 at every contact point throughout the system so that the proper FR PPE can be selected. The final step is to label all equipment with all the critical electrical safety information. The cost of these analyses can range from $3000 to more than $200,000.

Many well-meaning proponents of NFPA 70E insist that it is easy to use (i.e. "if you have not had an AFH analysis done, just use the tables"), but they overlook the fact that you cannot use the tables without access to the technical information required by the Notes I've described above.

All electrical contractors will have to adopt this standard in unison; otherwise it gives an unfair competitive advantage to anyone who continues to work energized. Our electrical contractor associations need to collectively get on board and urge their members all across Canada to refuse to do any live work. Once this starts, the movement will slowly spread to all contractors.

NFPA 70E is a great standard, driving important and long overdue changes that will keep our children and friends alive and unscathed. However, our regulators and associations need to start driving home the message that every facility should have an AFH study done. This is an unwelcome message, but one that needs to be sent. Implementing NFPA 70E carries an enormous cost to owners and shareholders, but it's mainly a one-time cost. When it is done, we'll have much safer facilities and work practices leading to fewer accidents, injuries and misery.

At recent conferences I've attended I heard many dire warnings about the liability to which supervisors and others could be exposed should they choose not to adopt and follow NFPA 70E. These warnings are always packaged in terms of provincial and federal charges, and fines, lawsuits, legal costs, etc. While this is true, society should recognize that we're in a transition phase, and that we should have a one-year moratorium on any criminal charges while industry implements the standard. It's a difficult standard to implement, after all, and punishing individuals and companies during this time of transition makes about as much sense as a police officer giving you a ticket on a highway with no signs. EB

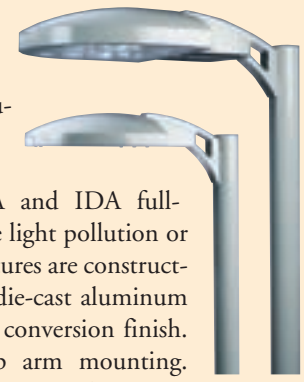
Dave Smith is president of Canada Training Group and has been providing consulting services to industry since 1980. This story and others can be found at www.canada-training-group.ca, and feel free to use this information to support your own safety program. E-mail davesmith@canada-training-group.ca.

Severe environment exit signs

Highlites' Weathergard series of AC and emergency LED exit signs are designed for use in severe environments, such as cold, damp or wet installations, as well as areas where accidental damage or vandalism may be a concern. The signs boast a rugged, wrap-around clear polycarbonate sign enclosure, affixed to a sturdy, die-cast aluminum frame. They are also corrosion resistant with neoprene-gasketed construction and stainless steel, tamper-proof hardware. The series has wall, ceiling, and end-/pendant-mount models, and your choice of Black, Grey, White or brushed finishes with matching canopies. Available options include self-diagnostic circuitry, fire panel interface, audio-visual alarms, two-circuit input and special wording.
Highlites

Outdoor luminaires with low visual signature

WARP9 from Kim is a low visual signature outdoor area luminaire featuring Visual Stealth Technology that helps it camouflage itself against its surroundings. You can choose from two housing sizes with electronic or magnetic ballasts. Select one of four distinct IES light distributions, then pick from a variety of mounting, fixture and finish options. WARP9 meets IESNA and IDA full-cutoff requirements for use where light pollution or trespass may be concerns. The fixtures are constructed of copper-free, marine-grade die-cast aluminum with a corrosion-proof chromate conversion finish. They are specified for pole-top arm mounting. Illumination is provided by a selection of wattages and colour temperatures, in HPS, MH or CFL.
Kim Lighting Inc.



Flat LED Lighting

GO Lighting (Toronto, Ont.) launched its GO FLL (flat LED lighting) solutions that, it says, will reduce energy costs for office, commercial and retail spaces while improving the quality of lighting and the work environment. GO FLL emits no UV radiation or EMI, and contains no mercury, lead or cadmium. It's also 100% recyclable. The lights can be recessed into ceilings or walls, and pendant-, T-bar- or surface-mounted—in any position. Fitting them into tight spaces is easy because the power supply can be separated and located some distance away from the actual fixture.
GO Lighting Technologies Inc.

HID flood luminaires

Crescent/Stonco's Silhouette is the latest in a series of architecturally styled area luminaires, and is suitable for outdoor applications requiring tight light control. The luminaire features one-piece die-cast aluminum housing finished in Duraplex II polyester, available in many standard and designer colours. It can be used in conjunction with Stonco's FloodPak multi-purpose series, as they share the same curved appearance and provide optimal cut-off technology meeting Dark Sky requirements. Its lens and lens frame resist heat and shock damage, as well as bug and dust entry. All internal electrical components are installed on a ballast tray that swings down for easy access and replacement. Other features include a key slot design that allows for single-person hook and placement of the fixture, leaving hands free for wiring, tool-less entry for re-lamping and a lens frame that opens by releasing a stainless steel latch.
Crescent/Stonco

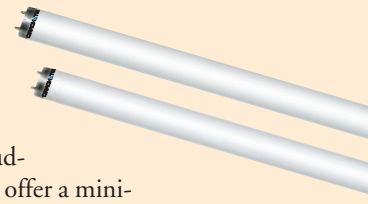
Energy-efficient luminaire

Columbia's two-lamp EnergyMax luminaire's parabolics combine a proprietary louver material and ballast to optimize both light output and energy savings. When compared to three-lamp parabolics that use 85 watts of power, EnergyMax two-lamp parabolics deliver the same lumen output while consuming less energy (67 watts). With its two 28W T8 lamps, EnergyMax Plus uses only 56 watts of power. An adapter plate is included with each fixture for fast wiring connections. An included plastic dust cover helps protect the lamp from construction dust and other hazards, while the shallow 4 7/8-in. housing height allows for installation in restrictive ceiling areas. Latches are fingertip actuated, positive-feed type, fabricated of spring steel and completely concealed in the black reveal.
Columbia Lighting

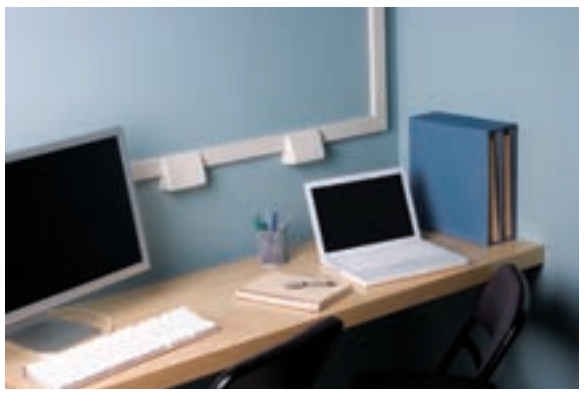
Protected MH lamps

GE's protected metal halide lamps employ a quartz shroud that surrounds the arc tube for containment in the unlikely case of an arc tube rupture. These lamps are intended primarily for use in open luminaires, but can also be operated in enclosed fixtures (and are designed to meet the containment test specified in ANSI C78.387). GE's mogul-based protected ceramic MH and MPR lamps are provided with an EX39 exclusionary base. GE MXR protected MH lamps employ E26 medium bases.
GE

Energy-efficient T8 lamps



Standard offers a range of energy-efficient T8 fluorescent lamps, including a 25W version, that offer a minimum three-year payback and reduced lamp-end blackening. The lamps are TCLP compliant, and boast a good CRI and lumen maintenance.
Standard Products



Labour-saving divided raceway

Wiremold/Legrand offers a compact, dual-compartment raceway for jobs not requiring the extra capacity of larger perimeter raceways or vertical drop systems. The Wiremold 2400D steel raceway system boasts downward-facing device boxes for receptacles and communications jacks that feature an 'over-the-raceway' design so they can be installed over a continuous run of raceway base, reducing cutting. Specially designed obstacle avoidance fittings enable the raceway to bridge existing runs of small raceway. The raceway is a FiberReady system, with available fittings to ensure a gradual bend radius for fiber optic and 10-gigabit cabling. The 2400D is available in Ivory and Fog White (the standard colour for low-voltage components).
Wiremold/Legrand

Full slide decorator dimmers and fan controls

Cooper expanded its lighting control product offering with new full slide decorator dimmers and fan speed controls. The switch provides dimming capabilities and fully variable and multi-speed 'quiet versions' of fan speed control. The increased area of the mounting straps and side- and back-wired terminals make installation quicker, while the low-profile housing (1.27-in.) gives installers more room inside the box for wires. The preset dimmers can be used for both single-pole and three-way wiring configurations, offering incandescent and magnetic low-voltage capabilities in a single SKU. They feature a high-gloss exterior made of UV-colour-stable material, and a dirt-resistant surface. They're also lighted for easier access in the dark, and fit any standard decorator wallplates.
Cooper Wiring Devices

Space-saving pull box ships flat

Hoffman's new EZ Form pull boxes boast a flat design that allows them to store easily in the shop or truck. The boxes can be hand-formed in 15 seconds or less, making them a convenient solution for installations where an extra pull box is required to fill an unanticipated need. Forming is quick and easy by bending along pre-scored fold lines; the sides interlock and snap into place without the use of tools. Plus, the pull boxes feature 16-ga. steel construction and flat covers, which can be removed for easy wiring access. With three commonly used sizes available (with or without knockouts) and conveniently located mounting holes, EZ Form pull boxes meet cUL and EEMAC industry enclosure standards.
Hoffman

Cat 6 UTP cable

Berk-Tek says improvements in the design and manufacture of the LANmark-1000 cable has resulted in a "best-in-class" Category 6 UTP cable. The LANmark-1000 has increased all crosstalk parameters by 4 dB over the old design, which already exceeded component performance as specified by TIA/EIA-568-B.2-1 Category 6. This is the result of both the re-engineering of the cable core design combined with investment in manufacturing equipment and new processes at the Pennsylvania facility. And the improvements have not changed the outside diameter of 0.226 in. or the price. LANmark-1000 is part of the NetClear GT2 Enhanced Cat 6 channel solution from Berk-Tek and Ortronics/Legrand.
Berk-Tek

Splices offer numerous approved conductor combinations

Panduit's Pan-Lug copper compression parallel splices deliver installation flexibility and reduced costs by offering numerous UL-listed and CSA-certified conductor combinations: 10 parts provide safe and reliable terminations of 278 conductor combinations to increase productivity and minimize inventory requirements. The splices feature industry-recognized colour coding and large, easy-to-read part numbering for visual verification in low-light conditions.
Panduit

Connection system for washdown environments

Woodhead launched its new stainless steel version of the BradConnectivity Ultra-Lock connection system, which is designed and engineered to meet the sanitary requirements of food, beverage and pharmaceutical manufacturers. The threadless, M12-compatible Ultra-Lock system comprises a series of integrated cordsets, distribution boxes and receptacles built on a patented 'push-to-lock' technology that enables fast, easy installation without turning the coupler. This positive locking feature, combined with a unique radial seal, assists in reducing downtime related to failed sensors and other control devices subjected to severe washdown. The O-ring seal is an IP69K-rated radial seal that is operator-independent; it maintains a constant pressure seal against moisture. (In fact, the seals have been tested against water pressures of 1200 psi to 1500 psi.)

Woodhead Industries

Range hood with compact profile

The UP27 professional-style range hood (the newest addition to the Best by Broan line of kitchen ventilation products), offers contemporary style and the performance of larger professional-style models in a compact, under-cabinet profile. Suitable for retrofit applications, the UP27 is available in internal and external blower versions, and accented by seamless welded construction of brushed 304 stainless steel. There are several blower options: the UP27I features a 700 cfm internal blower that can exhaust through the top or back of the hood for horizontal/vertical duct applications; and the UP27E offers the choice of four inline and four external blower options up to 1500 cfm. The UP27 series includes Evolution baffle filters and boasts the exclusive Heat Sentry system, which automatically detects excessive heat and turns the blower to a higher speed. The UP27 also features concealed, adjustable speed and lighting controls that remember the last setting used. The UP27 is available in 30-in., 36-in., 42-in. and 48-in. widths, and is 22-in. deep. A non-duct recirculation kit is available for use with internal blower models.

Broan-NuTone LLC

Cold weather filler foam

Specially formulated for use in freezing temperatures, Hilti CF 512 cold weather foam can dispense and cure at temperatures as low as 30°F. It is ideal for restricting air, sound, dirt and water infiltration in a variety of applications. The high-performance, high-yield foam is designed for filling around penetrations and general gap/crack applications, such as insulating around electrical outlet boxes and filling openings around HVAC ducts, pipe and cable penetrations. The product is a recognizable orange colour to distinguish from other foam materials (not for use as a firestop). For precision installation, it is used with the Hilti Premium CF DS-1 dispenser, which helps eliminate pressure loss and waste, and prolongs shelf life.

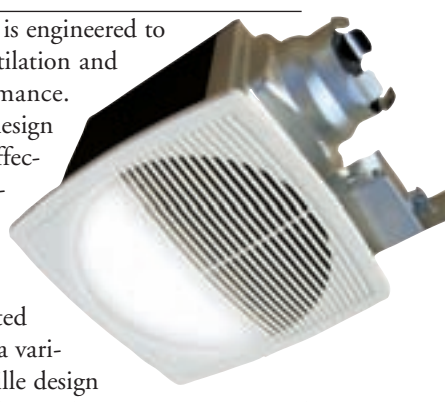
Hilti (Canada) Corp.

Compact PLC

The Telemecanique Modicon M340 PLC is a rugged, compact and user-friendly controller suitable for most applications ranging from factory automation and packaging to mining, oil and gas industries. The M340 integrates a high-speed USB port and offers two additional customizable communication ports; users can program online, transfer programs, access data files and manage remote operation and diagnostics thanks to open TCP standards and the embedded Web server functions. This openness ensures users can access their machines in complete security from anywhere on the floor, office or remotely. The PLC can manage applications up to 70K instructions and 256kB data, which is automatically backed up in the internal Flash memory. Data or maintenance files can also be stored and easily accessed from a PC or by simple 'drag-and-drop' via FTP. Each M340 module is 'hot swap' designed and automatically configured by the CPU when inserted into the backplane.

Telemecanique (Schneider Electric)

Bathroom fans



Aeroflo's AeroFan is engineered to provide good ventilation and efficient performance. The in-ceiling design delivers strong, effective and quiet ventilation for any bathroom. It is available in lighted and non-lighted versions, and has a variety of optional grille design upgrades that will complement any décor. It boasts two-speed operation, a long-life ball bearing motor, and thermal overload protection. Designed for easy installation, the fan has adjustable mounting brackets and fits 4-in. and 5-in. ducts. Selected units are UL listed for use over a tub/shower enclosure with a GFCI circuit.

Aeroflo Inc.

PRODUCT SHOWCASE EB

LITERATURE SHOWCASE EB

2008 test and measurement guide

TechniCAL released its 2008 Test & Measurement Guide, which provides information on products such as multimeters, clamp-on meters, electrical testers, calibrators, thermometers, etc. The free 74-page catalogue includes an additional 12-page Product Feature section, promoting new products from manufacturers such as AEMC Instruments, Comark Instruments, PPM Instruments and more.

For a copy, e-mail sales@technical-sys.com or call (866) 327-8731.

Composite versus steel enclosure literature

Stahlin Non-Metallic Enclosures has published "Composite First Choice"—a detailed enclosure user's guide comparing the benefits of non-metallic composites with stainless steel. Included in the literature is an easy-to-read quick-reference guide for buyers, which contains data specific to corrosion and chemical resistance, relative cost, UV resistance, ease of modification, dielectric strength, density, modulus of elasticity, specific gravity, and coefficient of thermal expansion.

You can view/download the guide at www.stahlin.com, or call (616) 794-0700.

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BY LES STOCH, P.ENG.

'Tis the season for the reason

A great deal of wisdom supports the reason(s) for writing each Rule of the Canadian Electrical Code (CEC); reasons that are not always clear to CEC users. In fact, we're not always completely satisfied to follow the Rules without first understanding the reasons behind them. So let's look at several Rules from Section 10, Grounding and Bonding, and explore the reasons behind them.

Rule 10-700(2)(a) specifies that a manufactured grounding electrode may consist of at least two, 3-metre ground rods driven full-length into the earth, spaced at least 3 metres apart and bonded together. Obviously, achieving the lowest possible (or, at least, acceptable) grounding resistance is the Rule's primary objective, but why a minimum of 3 metres?

Let's go to the beginning. The measured resistance of any grounding electrode is the sum of all its resistances including the grounding conductors and connections, the contact resistance between the grounding electrode and the earth, and the resistance of the earth. The first two are extremely small; we can, as a rule, neglect them, and it's customary to consider the resistance of the grounding electrode to be the resistance of the earth.

To better understand this concept, we can think of the soil around each ground rod as a series of cylindrical shells spaced equal distances apart around the rod. The cylinder nearest to and around the ground rod will have the highest resistance, since it has the smallest cross-sectional area and volume. As we move further away from the rod, each subsequent cylinder will have a progressively larger volume and, therefore, a lower resistance across it.

In practice, if we took a number of grounding resistance measurements at several distances from a single ground rod, we would find that about 25% of the total grounding resistance appears at 0.03 metres from the rod, 52% at 0.15 metres and 94% at 3 metres. In fact, we can only measure 100% of the total grounding resistance at an approximate distance of 7.6 metres to the rod.

Since most of the grounding resistance is nearest to the rod, we can conclude without difficulty that spacing ground rods closely together will not greatly improve the overall grounding resistance provided by a single rod. When the rods are spaced closely together, overlapping current dissipation from the ground rods during a fault increases their voltages and the overall grounding resistance. As the rule prescribes, we need to install ground rods at least 3 metres apart so as to effectively reduce the overall resistance of our grounding electrode.

Rule 10-806(4) requires that magnetic materials used to enclose grounding conductors must be bonded to the grounding conductors at each end. When a sleeve of iron or steel is used for mechanical protection, it amplifies the magnetic field around the conductor during current flow, increasing the voltage drop and impedance across the conductor.

How does bonding help? To reduce the inductive reactance due to the magnetic field, both ends of the sleeve must be bonded to the conductor so that the metal sleeve can carry a portion of the ground fault current, and to avoid an increase in the voltage drop and impedance in the conductor. (This preventive measure is not required when using non-magnetic sleeves for mechanical protection.)

According to **Rule 10-700(3)(a)**, a field-assembled grounding electrode may consist of a copper conductor at least 3-metres long, sized in accordance with Table 43, enclosed in the bottom 50 mm of a concrete foundation footing and at least 600 mm below grade.

How does enclosing a conductor in concrete provide an effective grounding electrode? Concrete located below grade has a somewhat lower resistivity than average loam soil. For this reason, encasement of a wire in concrete will result in lower resistance in earth of average or high resistivity. This is due to the reduction of grounding resistance closest to the electrode. (From our earlier discussion we already know that most of the overall grounding resistance will be found nearest the copper conductor.)

Rule 10-702 specifies that, where there are multiple grounding systems for electrical, communications, CATV and lightning protection systems, they must be separated at least 2 metres from each other and bonded together by a minimum #6 AWG copper conductor. In the case of lighting protection, bonding between systems must be at or below grade.

What are the advantages of this rule? Separation and bonding are both required because a ground fault could occur on any of the systems; this ensures a low impedance fault path to clear faults on any of the systems as quickly as possible. Bonding between grounding systems is also required so that, in the event of a lightning strike on any of the systems, damage may be avoided from side flashes between the grounding systems. EB

Les Stoch, P.Eng., is president of L. Stoch & Associates, specialists in quality management/engineering services. He is a member of PEO, OEL and IAEI, and develops and delivers electrical code and technical workshops for Dalhousie University. He also developed the Master Electrician training program and Exam (Ontario) for the Electrical Contractor Registration Agency. Visit him online at www.lstoch.com.

Questions and answers compiled by ESA

Tackle the Code Conundrum... if you dare

So, you think you know the electrical code, eh? Well, we'll soon find out if you're an electrical code junkie or downright code-clueless. Take a look at the following questions and check your answers in February's Electrical Business.

How did you do?

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

Question 1

Voltage applied to piping for pipeline resistance heating shall not exceed 120V, and the supply shall be from an auto-transformer.

a) True **b)** False

Question 2

A garage that is part of a bulk storage plant—in which tank vehicles are stored or repaired—shall be considered to be a Class I, Zone 2 location up to ___ mm above floor or grade level (unless conditions warrant more severe classification or a greater extent of the hazardous area).

a) 50 mm **c)** 300 mm
b) 150 mm **d)** 450 mm

Question 3

Tap connection conductors for a field-wired recessed luminaire shall be installed in a raceway extending at least 300 mm, but not more than 2 m, from the luminaire and terminated in an outlet box.

a) True **b)** False

Answers to Code Conundrum

Electrical Business November/December 2007

Q-1: Non-current-carrying parts of tube stands, tables and other apparatus in an installation of diagnostic imaging installations shall not be bonded to ground.

False. Rule 52-014 states: "Non-current-carrying parts of tube stands, tables, and other apparatus shall be bonded to ground in conformity with the requirements of Section 10".

Q-2: All metal raceways and all non-current-carrying metal portions of fixed or portable equipment used in finishing processes—regardless of voltage—shall be bonded to ground in accordance with Section 10.

True. Rule 20-414.

Q-3: 35 (1-1/4) rigid PVC conduit shall be securely attached to hangers or to a solid surface with the maximum spacing of the points of supports not greater than:

1.2 m. Rule 12-1114(1)(b), which refers to the maximum spacing of conduit supports: (1) "All rigid PVC and HFT conduit of one size shall be securely attached to hangers or to a solid surface with the maximum spacing of the points of supports not greater than: (b) 1.2 m for 35 (1-1/4) and 41 (1-1/2) trade size conduit".

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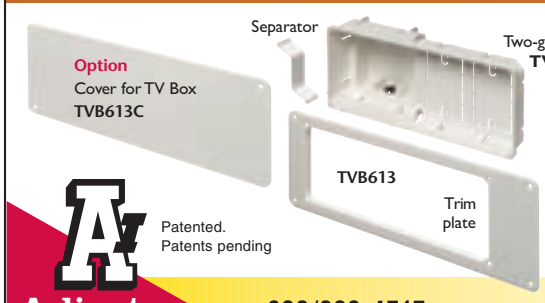

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Patents pending

CSA with grounding lug only

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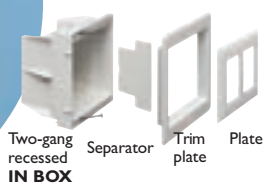

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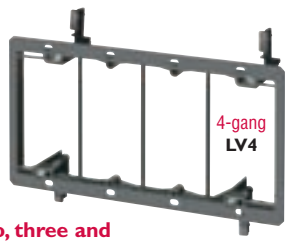

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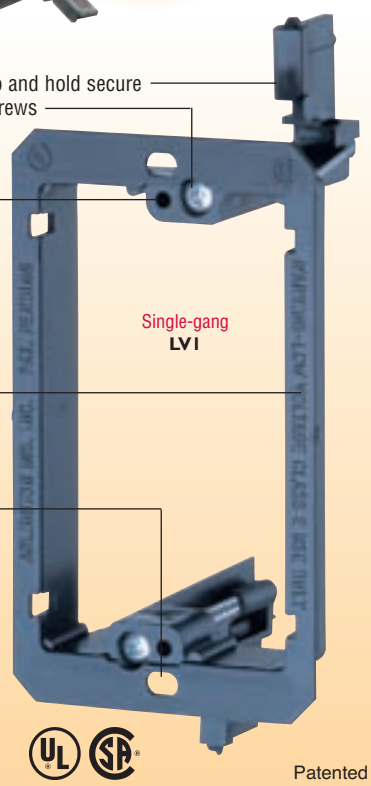

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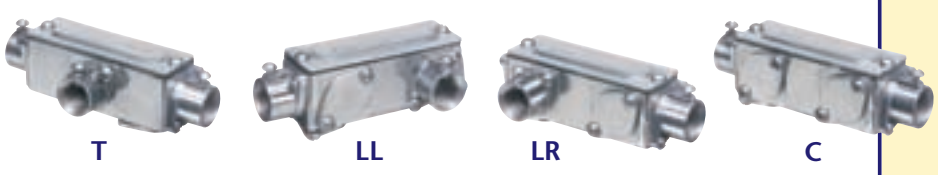

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