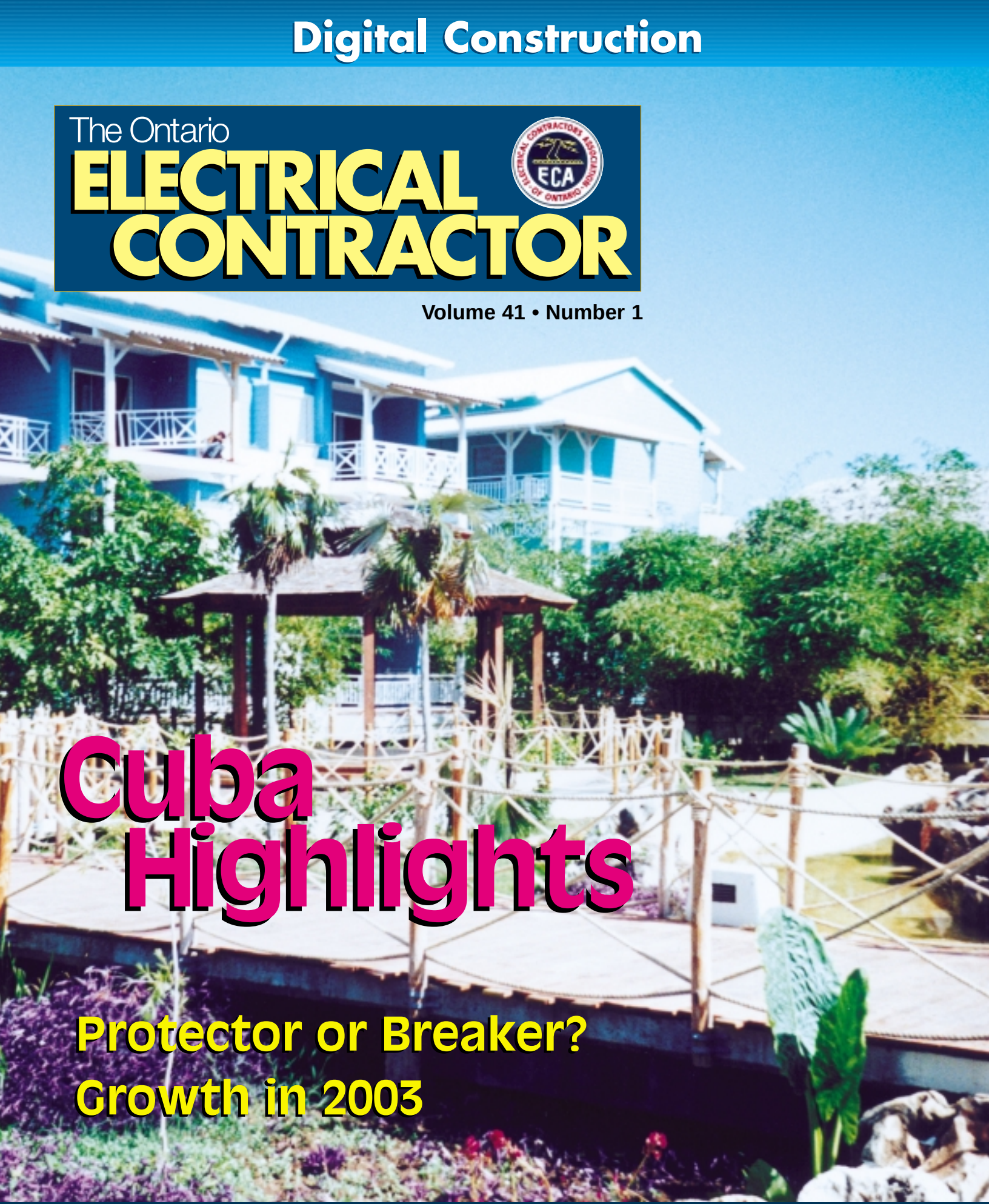
The Ontario
ELECTRICAL CONTRACTOR

Volume 41 • Number 1



Cuba Highlights

Protector or Breaker?
Growth in 2003

The Voice of Ontario's ELECTRICAL CONTRACTING INDUSTRY

"A supplement to Electrical Business February 2003 issue Canadian Publications Mail Sales products Agreement No. 40665085"

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Earle Goodwin

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ECAO
ELECTRICAL CONTRACTORS ASSOCIATION OF ONTARIO

170 Attwell Drive, Suite 460, Toronto, Ontario M9W 5Z5
Tel: 416-675-3226 Fax: 416-675-7736
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Upcoming Events

4th Annual Enercom Conference & Exposition
Metro Toronto Convention Centre South Building
Toronto, Ontario
March 4-5,

Grounding & Bonding Electrical Systems
Detroit Michigan, 905-361-1901
March 13-14,

Canadian Electrical Safety Code Course
Brought to you by Onsite Electrical Training Inc.
Toronto Area, 705-266-8073
March 15,

Implementing the CSA Privacy Code Seminar
CSA Conference Centre
5060 Spectrum Way, Suite 100
Mississauga, 416-747-4017
April 3,

Hannover Fair 2003
Hannover, Germany, 800-727-4183
April 7-12,

Electrical Showcase 2003
Energizing the Future
Winnipeg Convention Centre
Winnipeg, MB
April 15-16,

Safety Awareness Month
In association with OEL, IBEW,CCO,CSA International, Electrical Safety Authority, CLBMedia, International Association of Electrical Inspectors, Hydro One Networks, EDA,
Month of May,

Canadian Electrical Contractors Annual Conference
The Fairmont
St John's, Newfoundland
June 18-22,

IEEE Power Engineering Society
Toronto, Ontario
July 13-17

To add a date to ECAO's current events calendar please e-mail egoodwin@ecao.org

O'Neil Draw Winner

Anyone who purchased off the shelf Osram/Sylvania or Canlyte product from O'Neil during October & November 2002 qualified for a ballot to win a $7,000 Suzuki Quad Runner. The promotion culminated at O'Neil's annual "Veal with O'Neil" Christmas customer appreciation event on December 6th. Joe Zimbalatti of Canlyte drew the name of Sam Paglialunga from Oban Electric as the lucky winner of the Quad Runner.

(from left to right) Mike Buchholz (O'Neil V.P. Marketing), Herb Johnston (Osram/ Sylvania), Sam Paglialunga (Oban Electric on top of the Quad Runner), Joe Zimbalatti (Canlyte) & Michael O'Neil

Editor's Message

We are blessed, in Canada, with seasons that change. Sometimes it doesn't seem like a blessing, though, especially this time of the year. We chose the picture on the cover for those of you who are suffering from Seasonal Affective Disorder or just the mid-winter blahs, hoping it would buoy your spirits. The picture comes from Sandals Royal Hicacos Resort and Spa, the site of our Annual Conference last October. If the cover wasn't enough, we've also provided an article and more pictures from the conference. This well-attended event was, by all accounts, the most successful to date. We are attempting to better it with our next conference being held in St. John's, Newfoundland. This time we will be co-hosting with the Canadian Electrical Contractors Association (CECA), so you get two conferences for the price of one. The conference will be held from June 18-22, which is very early for us. We hope you'll mark your calendars accordingly and join us in St. John's.

Bob Collins, who regularly provides us with economic information, also provides some information to help cheer you up. He sees an increase in growth in Ontario for 2003. Of course, in a province as large and diverse as this one, each region will be effected differently. Bob breaks the province down by region and by job sector in his analysis.

Helping keep us up to Code, the Electrical Safety Authority's Rick Martin explains the intricacies of supplementary circuit protectors. These protectors are often hard to distinguish from a "real" circuit breaker. They can look similar, but they are designed for completely different purposes. Reading Rick's article will put you in a position to tell the difference and make the right choice.

And rounding out this issue, I've provided a piece on new construction methods in the information age. This story came out of a conversation I'd had with one of our contractors. We both recognized that things were changing. (These days, it's hard to find anything that *isn't* changing.) But neither of us had seen any information on where these changes were leading. I enjoyed writing and researching this piece, but found it somewhat difficult to write. Not because there wasn't enough information. In fact, just the opposite. There are so many advancements in this field, so many possibilities, it's hard to choose what to say.

I hope you enjoy this issue. We next publish in April when the weather should be quite a bit better.

Earle Goodwin

President's Message

With this issue of the *Ontario Electrical Contractor* we start a new year. The annual conference in Cuba last October was a huge success, and we expect that the ensuing year will be just as successful for the Association.

One of the issues we will be watching extremely closely, and hope to see concluded by this time next year, is the establishment of province-wide contractor licensing. Establishing one license for all electrical contractors in the province has a number of benefits. The most obvious is eliminating the need for a contractor to have a separate license in each locality that the company works. Another is putting all contractors on an equal footing. We'd all pay the same licensing fee and, more importantly, we'd all pay.

The underground economy is a major concern for those of us who follow the rules. It puts us at a disadvantage because we not only pay our fair share (which adds to our costs) but we end up picking up the tab for those who fail to register as businesses. Although it's not formally tied to licensing, it doesn't take much imagination to see where enforcement of other required payments, such as WSIB, could be more easily accomplished once everyone was identified. Frankly, that *should* be a requirement for licensing.

We, along with the Ontario Electric League and Electrical Safety Authority, our partners in this endeavour, have made our submissions and the bulk of the work now falls on the provincial government. They have set up a committee of Assistant Deputy Ministers from the five ministries that would have to review the impact on their legislation.

Five ministries (Consumer & Business Services, Training Colleges & Universities, Labour, Energy, and Municipal Affairs & Housing) are involved because, during our presentations, the scope of the conversation quickly broadened to include trade self-regulation. This ties in well with the recommendations we helped develop through the two Electrical Trade Symposia that we, along with all electrical trade-related organizations, participated in.

Trade self-regulation would, in our opinion, put control of the trade with those who understand it best, and have the biggest stake in seeing that it's well-regulated. It would allow us to deal with issues such as trade splintering and trade qualifications fairly, efficiently and rationally.

If this receives government approval, we will become the first self-regulated trade in the province. As I said at the outset, we are intently watching this important issue and will keep you informed.

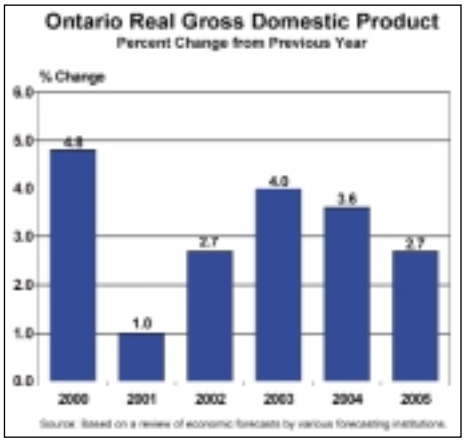
George Boals

Optimistic Outlook for 2003

Growth to Pick-up in 2003

By Bob Collins

Following a poor performance in 2001, Ontario should report a respectable 2.7% real growth in 2002, compared to 1.0% in the previous year. Resilient consumer spending and a booming residential market, driven by strong employment numbers and low interest rates, helped stimulate increased economic activity. Real growth is estimated to increase to 4.0% in 2003. While consumer spending and the residential market are expected to cool over the short term, rising capacity utilization rates and stronger business profits should stimulate the return of capital investment.



The biggest threat that could limit growth in Ontario is the state of the economy south of the border. Growth in Ontario will eventually slow if the US economy does not maintain some level of sustained growth by mid-2003. In addition, the uncertainty of a Middle-East crisis will dampen both consumer and business confidence; weakening spending, production and employment. In the event of a prolonged war, the cost of energy shocks would also be damaging to sustained growth.

Defying the Odds

Construction defies the odds as activity and employment continue to grow. Most economic slowdowns are followed by sharp declines in construction investment, typically with a lag of some months. There is no sign of any significant slowdown in 2003. Construction investment in buildings was up 3.9% over levels reported in 2001. This activity was driven primarily by the strength of the residential market, up 5.5% in 2002. However, the residential market is expected to slow to a 1.3% investment growth increase in 2003.

Any softness in the residential market will be replaced by increased investment in the industrial, commercial and institutional (ICI) sectors. ICI investment was down by 0.3% in 2002 as weak economic conditions limited any growth in the early part of the year. ICI investment is estimated to increase to 4.5% in 2003 and increase further to 6.3% in 2004 as the US economy gains strength and capital investment returns to stronger levels.

Industrial Investment: The industrial sector should resume growth. Renewed business confidence, increased profits, and rising capacity utilization rates should support business investment, as the cost of capital remains low. Real industrial investment is projected to increase by 11.0% in 2003 but slow to 4.4% in 2004.

Commercial Investment: The commercial sector remains weak. Slower employment growth, easing off of consumer spending and the uncertainty of sustained growth in the US will limit any significant growth in this sector in 2003. Real growth is estimated at 1.9% in 2003 but should increase to 10.6% in 2004 as the US gains economic strength.

Institutional Investment: Following several years of high investment, institutional spending is showing signs of easing off. Investment is estimated to increase by 1.7% in 2003 and 1.6% in 2004. Lower growth is the result of decreased investment in education facilities. Education investment levels may change given the on-going review of the state of educational facilities and limited capacity of post-secondary institutions. Investment in hospital and other health care facilities should remain fairly strong over the short term

Activity Varies Across Regions

One measure for assessing the state of construction across regions is the value of building permits issued. Permits are a measure of 'planned' construction and are therefore not an accurate measure of actual activity but are a useful lead indicator of potential activity.

Ontario ICI permits issued were up 6.1% in 2002 compared to levels reported in 2001. Much of the gain was in the institutional sector, increasing by 16.8%. Commercial permits continued to be weak with an increase of only 1.5% while industrial permits issued were down 22.0% reflecting the weak industrial conditions.

Prism Economics

Across the regions, the results are mixed. Building permits were down in Eastern Ontario. Both the industrial and commercial reported declines of 36.4% and 1.7% respectively. Institutional permits were up 22.7% in the region.

Central Ontario (excluding the Greater Toronto Area) has been very active. The value of ICI building permits is up 30% compared to 2001. Permits issued now rival levels reported in the GTA region. The strongest growth has been in the commercial (+54%) and institutional (+24%) sectors with industrial reporting a 9.5% increase.

The GTA region continues to show the effects of a weak US economy. ICI permits are down 15% compared to 2001. The

Value of ICI Building Permits Percent Change 2001-2002 (%)				
	Industrial	Commercial	Institutional	ICI
ONTARIO	-22.0	1.5	16.8	6.1
Eastern Region	-36.4	-1.7	22.7	1.0
GTA	-24.6	-26.0	7.5	-15.1
Central	9.5	54.1	24.0	32.7
Southwestern	30.9	-2.4	2.4	7.5
Northern	185.3	-1.6	54.5	51.1

Source: Statistics Canada, Prism Economics

declines are associated with weak industrial and commercial markets. Commercial building permits have declined for the third year in a row. These trends are unlikely to change until the US reports more sustained growth.

Southwestern Ontario is experiencing a slowdown in the value of permits issued. Following several years of double-digit growth in institutional activity, permits are estimated to increase by only 2.4% compared to a 36.3% and 70.6% in 2000 and 2001 respectively. Commercial permits decreased by 2.4% compared to 2002. The bright spot for southwestern Ontario is the potential return of industrial investment, up 30.9% compared to 2001.

The construction sector in Northern Ontario remains weak but there are signs of improvement. Building permits have been on a slow but steady increase since 1996. ICI permits are up 51.1% compared to 2001, driven primarily by institutional projects and the return of industrial spending. Permits for the commercial sector continue to decline, down 1.6% in 2002.

Downside Risks?

The Ontario economy is now well into a solid recovery following the US recession. The ICI construction sector should register respectable real growth over the short term. However, it is not without its risks. While Ontario has outpaced growth of the US, a continued sluggish US economy late into 2003 will eventually spill over into Ontario.

An even greater concern is the situation in the Middle-East. It is only a matter of time before the US will feel the need to take some form of action. A drawn-out situation in Iraq would fuel increased energy prices and limit the capacity for the US to sustain any significant economic growth. However, we are optimistic that the Iraq situation will be brief and that the US will work its way through a current "soft" economy. The US Federal Reserve cut interest rates by 50 basis points back in November 2002 to ensure the economy maintains some momentum in 2003.

Bob Collins is a partner with Prism Economics and Analysis, which specializes in labour/human resources, international trade and industrial economic analysis.

Cuba, Si!

The Electrical Contractors Association of Ontario was given the royal treatment at the Sandals Royal Hicacos Resort and Spa, Varadero, Cuba, the site of the 2002 Annual Conference, October 19-26, 2002.

This was the "soft" opening for the resort and we were welcomed with open arms as its first guests. The staff lined the walkways and applauded as we walked to the Night Club where we filled out our registration cards and were given our rooms. This was the culmination of a lot of hard work by the resort's management and staff to have the place ready for our arrival. Originally scheduled to open in March, work was delayed by several months when crews were diverted to other parts of the island to repair the worst storm damage Cuba had seen in nearly 40 years when hurricane Michelle hit in early November, 2001. But that was all behind them as we were guided to our spacious rooms.

The conference itself was as successful as the resort was beautiful. Kit Grant made two presentations on the first day. In the first he explained why we find some people difficult to deal with and how, by knowing our own style of relating, we could cope more effectively with others. In the second, he provided us with information on how to strengthen our businesses through improved customer service.

Other presentations throughout the week included a presentation on risk management by Gary Borodenko and Bruce Burton of Federated Insurance.

Brigette Walenius, Second Secretary (Commercial), of the Canadian Embassy in Havana, told us about how business was conducted in Cuba. It is very difficult for foreign contractors to work there, but she gave us the steps that we'd need if we were interested in pursuing work there. The week was rounded out with a presentation by Ross Brewitt, sports writer and author, who related some of his experiences from the time he has spent working with the National Hockey League.

Of course, there were formal and informal opportunities for the delegates and their spouses to get together, renewing old acquaintances and making new ones. The resort put on a welcome reception and dinner. Being served outdoors, it brought us the only real rain we saw all week. We wound the week up with the President's reception and ball.

Keynote speaker, Kit Grant (left), with ECAO President George Boals.

Ross Brewitt tells stories of life on the road with the NHL at the Farewell Lunch.

(L to R) PowerTel's Chris Krueger and Wayne Gatien accept their company's R. H. (Hugh) Carroll Award from ECAO Executive Vice President, Eryl Roberts.

Glenn Carr, Earl Carr and Gary Carr (L to R) at the President's Ball.

Wing Commander of the ECAO Air Force, Erv Krause, confers with his pilot before take-off.

First Vice President and Master of Ceremonies, Dave Mason, with speaker, Brigette Walenius, from the Canadian Embassy.

The Red Team shows its prize winning tug-o-war form at the Beach Olympics.

Supplementary Protectors and the Electrical Code

By Rick Martin, P.Eng.

Can Supplementary Protectors be used as branch circuit protection as defined by the Canadian Electrical Code?

The quick answer is No, but in order to understand why they are not permitted, one has to understand what is a "supplementary protector". Supplementary protectors are certified to CSA C22.2 No. 235 and the scope states the following;

> "This Standard applies to supplementary protectors, of the manual-reset type with or without a manual operating means, and intended for use as a component within an appliance or other electrical equipment where branch circuit overcurrent protection is already provided (or is not required) in accordance with the Rules of the Canadian Electrical Code, Part I."

The existing problem:

Some devices have been called circuit breakers with short circuit ratings and various trip curves, but are only certified as supplementary protectors. There are hundreds of different types. Companies certify the devices to a Canadian standard called C22.2 No. 235. Many are also certified to the US standard UL No 1077.

Some supplementary protectors look identical to a "real" circuit breaker certified to C22.2 No 5.1.

The certification organizations have recently been asked to mark the devices so they can be identified, but older product lines are hard to identify. New products to the CSA standards will have a component mark as shown in figure 1, and figure 2 (That is the CSA logo with a small triangle, or the UL component mark, the backwards UR mark). Product that meets the UL standard UL 1077 will be marked with the UL component mark.

"Supplementary Protectors" are not tested for branch circuit protection as defined by The Canadian Electric Code.

Certified to spec C22.2 No. 235, it has no code applications for over current protection.

How to approach the issue

To clear up confusion it is important to get the application data sheets for the devices, review the data sheets and talk to the manufacturer so that there is no confusion as to the proper application.

Once the warnings are read and limitations understood, it will be obvious as to proper use. But note that since there have been many years of using the wrong product, this is difficult to change in a short period of time.

In summary, from a code point of view, Supplementary Protectors have no code applications for over current protection. The word "supplementary" was an interesting choice since it is just "supplementing" the over current, it is not the branch over current device.

These devices may be used for other reasons such as a switch, under voltage protection, etc. But even here one has to be careful to select the product and ensure it is certified for the particular application. There is a very broad range of devices certified as "supplementary protectors". That is why they are to have a "component" certification mark. This is to show users that they need further investigation. If they are in the circuit, they do not provide branch circuit protection. That means other code rules need to be applied to get branch circuit protection. This may involve a much more complex interpretation of the codes and standards and may also mean that additional over current protection may need to be installed.

How can you tell it is a supplementary protector?

Because there is a lot of older product still out there, the only way to determine if they are "Supplementary Protectors" is to ask for the manufacturer's data sheet, or check the certification report. If certified by UL, there will be a reference to the US specification on supplementary protectors UL No. 1077 on the device.

Some supplementary protectors are quite small and that is the first clue that it is not certified to C22.2 No 5.1. These devices have also been referred to as "mini breakers" But some look identical to "real" circuit breakers.

Summary

Supplementary Protectors are devices certified to C22.2 No 235 and are not suitable for branch circuit protection.

Manufacturers are producing new products that are din rail mounted and meet the circuit breaker standards. There are new products coming out every year.

The supplementary protector does not provide branch circuit protection and there are still customers unknowingly using them as branch circuit protection.

The future

The CSA standard C22.2 No. 235 is being revised and should be out in 2003. The standard has become much more complex and separates out in various categories from the robust supplementary protectors to those that are not so robust. Although this is much more complex, it will not allow designers to apply the product based on certification test data.

But note that the standard still clearly says they are not for branch circuit protection. They are intended for use as a component within an appliance or other electrical equipment

Rick Martin, P. Eng. is Senior Research Engineer, Field Evaluation, with the Electrical Safety Authority

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Construction in the Land of Digits

by Earle Goodwin

We are living in the early days of the information age, and, like the industrial revolution that preceded it, everything we do is going to be influenced by it. That includes the way we build buildings.

In a nutshell, contractors are concerned with finding work, bidding work, doing work and billing work. At first glance it's easy to recognize that finding, bidding and billing are all "information" exercises. A close look at doing work shows that there is a heavy "information" component to that, as well. Organizing schedules, monitoring materials and costs, tracking work progress and solving design problems are all information-based activities. This fact has not been lost on the "digital community" – developers of hardware and software, as well as contractors who say to themselves, "There must be a better way."

That better way has been coming for some time. It is only now, with the convergence of communications technologies that the components that were required to make it available have started to come together.

The piece of enabling technology responsible for this age is the computer.

Broken down to its barest state, a computer is a device that computes (obviously) and remembers data. You could argue that it doesn't even have to remember the data, but the growth of random access memory (RAM) and storage media capacities is an indication of the importance we put on this capability. Though originally created to crunch numbers, applications were quickly developed to allow it to crunch words, and manipulate data records. Not far behind came the development of graphics capabilities.

And as the capabilities grew, the computer became smaller and faster. The same computing power that used to be housed in machines that filled dedicated, climate-controlled rooms can now be found in a programmable calculator. The computer that sits on your desk today is more powerful, by far, than the onboard computers that put the lunar excursion module on the moon.

The power of the computer is not in its ability to perform certain tasks. It's in its power to perform any number of tasks. Many of us remember a comic strip by Al Capp called L'il Abner. Every once in awhile, Abner would run across a creature called a Shmoo. A great description of the Shmoo can be found at www.lil-abner.com (there are websites for everything):

"According to Shmoo legend, the loveable creature laid eggs, gave milk and died of sheer ecstasy when looked at with hunger. The Shmoo loved to be eaten and tasted like any food desired. Fry a Shmoo and it came out chicken. Broil it and it came out steak. Shmoo eyes made terrific suspender buttons. The hide of the Shmoo if cut thin made fine leather and if cut thick made the best lumber. Shmoo whiskers made splendid toothpicks. The Shmoo satisfied all the world's wants."

In the computer, we have the digital embodiment of the Shmoo.

Also, outside the world of computers (although it was computers and the research that went into developing them, that made a lot of it possible) communications capabilities were growing by leaps and bounds. Telephone networks were expanding their capacity and fidelity. Satellites were launched to allow us to interconnect networks around the world, and cellular phone networks were developed allowing us to receive and make phone calls wherever we happened to be.

As this was happening, systems engineers were working on ways to send the output from computers to other computers over networks that were originally designed for voice. After all, digital signals are just strings of zeros and ones. These could be coded to represent numbers, words, or images. And a network that could reproduce something as complex as the human voice could certainly handle zeros and ones. Taking it one step farther, if they could be sent over wires and beamed up to satellites, they could also be beamed, wirelessly, like cellular phone calls.

The U.S. Department of Defense was quick to recognize that a network consisting of its sites

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and those of several major universities would be valuable for collaborating on its high level projects. Because of the nature of the projects, it was essential that this network be secure. Another concern was that it had to be designed in such a way that if any one or more locations were knocked out, the rest of the network had to remain viable. This network was called the Advanced Research Projects Agency Network (ARPANET) and it eventually evolved to become today's Internet and the World Wide Web.

On the software side, programmers were creating scheduling, project planning, drafting, and accounting software. These programs became more sophisticated as computing power and mass storage capacities grew. For example, drafting (CAD) software started with the ability to create flat, 2-dimensional drawings. As it evolved, it became able to produce 3-dimensional drawings. From there, rendering capabilities were added and finally the ability was added to take a viewer on a tour of the not-yet built building – "Virtual Reality" or "VR".

Today, with all of these technologies coming together, it is possible to conduct the whole construction management process digitally, from design to substantial completion.

Architects and engineers design the building using CAD software. As it is being designed an electronic model is being created. This can be tested for loads and stresses taking into account the materials and construction methods being used. The design team can also look at the building systems and make sure that, for example, the ductwork and conduit don't conflict. They can also render the model and take the owner through it to approve such details as finishes and traffic patterns. When everyone is satisfied, the tender package can be put together and sent to the bidders by email.

At the contractor's site, the estimator can get accurate counts of fixtures and lengths by calling them out of the electronic drawing. This information can then be plugged into the estimating software, which also has component and labour cost information programmed into it, and the bid price can be developed. This same information becomes the budget for the project.

When the contract is awarded, the contractor can install a computer at the job site that is connected to his head office network. This gives the supervisor complete access to all the information housed in the office. Because they are working from the same data, head office personnel can monitor the job properly. The information can also be fed into the accounting software to generate accurate progress bills.

The general contractor can also set up a website for the project that will give everyone involved with the project access to the most up-to-date drawings, project documentation, meeting minutes and project correspondence.

If a problem arises, the site supervisor can take a digital picture of it, digitally annotate the relevant portion of the drawing, and send all of this, along with a written description of the problem, off to the consultant by email for a solution. The consultant reviews this material, makes the appropriate changes, gets all the necessary approvals, and the problem can be resolved in hours rather than days. There's no need to wait until the next site meeting and the consultant can be anywhere in the world. If the problem involves more than one trade, everyone can get together on line, mark up the drawings together and discuss the solution, all in real time.

Throughout the process, as-built drawings are being developed, as is all the documentation that's necessary for substantial completion. It's all neat and tidy and can, in theory, be done without printing one sheet of paper. That includes invoices being sent electronically and the deposit being made directly into your bank account.

This is all possible with the technology that exists today. In fact, it is all being done today, although very few projects are being built using this whole system.

"Why not," you might ask?

One of the biggest hurdles is standardization. In order for the foregoing example to work, everyone has to be using the same software and has to meet specific hardware specifications. The hardware part of the problem is usually fairly easy to solve, but the software is a different matter.

There are numerous software products being developed to meet each of the needs we have just looked at. Each software developer comes up with his own solution, and each program that's developed has strengths in some areas and weaknesses in others. If you are an electrical contractor working on ten projects with ten different generals, you could find yourself in a situation where you'd need ten different software packages to do the work. That's ten programs that you have to buy, ten programs to learn, ten interfaces you would have to set up with your accounting software, and ten Internet sites you'd have to visit to get a full picture of how your company is doing. At the moment, it's just not feasible.

But it's not far off. In fact, there are a number of companies that are using parts of the solution. Most importantly, there is a growing demand to make it all work. And with all that is at stake, and the savings, in terms of efficiency, that are to be gained, you can bet that it will be here – soon.

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