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# THE *Newsletter for the Members of the EIA of BC* INSPECTOR

February, 2006



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## **Don't Let the Smoke Get in Their Eyes**

By James Carpenter, CEO & Executive Director, IAEI

We live in changing times. It seems as soon as we get comfortable, or at least used to a situation, things change. The price of gas goes up again. Property evaluations and, therefore, taxes increase. Somebody commits suicide by blowing himself up to kill and maim others. These are the types of things that are making the news today. But many other things are happening that kind of fall under the radar. Things that may not affect us or our way of life right now, but may have far-reaching consequences as time goes on. Not so recognizable at the present time, these are the things that we must remain on the alert for.

For instance, many jurisdictions have been reducing their inspection department staff or trying to combine duties because of the notion that inspections or inspectors are not needed. No one is being killed by unsafe electrical installations. An inspector relayed to me recently his experience with his city manager. He had gone to him asking for additional inspectors. The manager listened to his appeal then turned to look out the window at the city and asked the inspector what he saw. "A beautiful skyline," answered the inspector. The manager asked if he saw any smoke or any buildings on fire. "No," said the inspector. "What do we need inspectors for?" asked the manager. The electrical inspector quickly answered, "To keep that beautiful skyline just as you see it today."

Our safety systems have served us well since the introduction of that thing called *electricity*. We have learned the difficult lessons and if we remain diligent, we can keep that skyline without smoke and fire and not electrocute ourselves. Uncontrolled and unmanaged, things could be a lot different. We must remain diligent for the little things!

Some places are questioning the need for independent third party evaluation of electrical material, devices and equipment. We have grown to expect that these things have been evaluated and are free from electrical shock and fire hazards. Some seem to think the requirement for electrical products to be evaluated for safety is

too great an expense. There is no great loss of building or lives attributed to electrical equipment. No fire - No problem. No loss of life - No problem. We must remain diligent for the little things that could become big!

Some places are advocating more "self-certification" and are only doing spot-checking. This seems to be brought on when the untrained or uninformed think that if there is no smoke or fire on the skyline there is no problem. Many designers, manufacturers, and installers are doing the right things and the finished design, product, or system meets or exceeds codes and standards. There are those who train their people and continually train them in the proper and safe way of doing the job. If this were true throughout the industry, then maybe self-certification and spot-checking would be a viable alternative. BUT! We must remain diligent for the little things that could become big!

Some don't see the necessity of qualified and well-trained inspectors. Those designers, manufacturers, and installers that are conscientious and are practicing their profession with the goal of having a safe and useful system want the people, the AHJ, to be as knowledgeable and qualified as they are. That AHJ, that other set of eyes, must be well-trained and remain well-trained and qualified to keep the smoke and fire from the skyline. We must remain diligent for the little things before they become big!

What can we do as individuals, groups, (Chapters and Divisions), and IAEI? As individuals, we can become active in the local neighborhood by speaking to our golf or fishing buddies; carrying the safety message to our Masonic Lodge, Kiwanis Club, and the Rotary; and volunteering to teach our children about electrical safety in the schools. The more people are aware of the dangers of the improper use and control of that thing we call electricity, the better chance we have of keeping the skyline free from smoke and fire.

*Continued on page 2. See: "Smoke. . ."*

### ***Bonding with our Neighbours***

by Leslie Stoch

Both the Canadian Electrical Code and its American counterpart, the *National Electrical Code* provide similar definitions for the metallic means of bonding electrical equipment and raceways. In this article, I'd like to review some of the similarities and differences in the acceptable bonding methods in Canada versus the United States. Let's begin with the definition of *bonding* as expressed in our separate electrical codes.

According to the CE Code, bonding is "a low impedance path obtained by permanently joining all non-current-carrying metal parts to assure electrical continuity and having the capacity to conduct safely any current likely to be imposed on it."

According to the *NEC*, bonding is "the permanent joining of metallic parts to form an electrically conductive path that ensures electrical continuity and the capacity to conduct safely any current likely to be imposed."

As you can see, although some of our words are different and rearranged in a different format, both definitions provide the same, understandable overall objectives. There is a greater difference in the words used in our separate electrical codes to describe bonding methods. Canada's CE Code uses the term *bonding conductor* to define the methods we use for equipment bonding. The *NEC* term uses *equipment grounding conductor*. (This is sometimes a source of confusion when we use American literature. We really should get together on a common definition.)

But here is where our similarities come to an abrupt end. Both electrical codes have a common list of bonding methods recognized in both countries. But *NEC* goes much further, offering a wider range of permissible options than our CE Code. I have italicized the bonding methods permitted by the *NEC* that are not used in Canada in the following bullets.

The Canadian Electrical Code permits the following materials to be used as bonding conductors:

- Copper conductors or other corrosion-resistant material (usually aluminum)
- Metal busbar or pipe
- Rigid metal conduit (except stainless steel, directly buried, in concrete or masonry that is in contact with the earth or where corrosion or damage is probable)
- Electrical metallic tubing (except in concrete or masonry in contact with the earth or where corrosion or damage is probable)
- Copper or aluminum sheaths or the marked conductors of mineral-insulated cable (except that cables with aluminum sheaths require corrosion protection as necessary)
- Sheaths of aluminum-sheathed cables (with corrosion protection as necessary)

The *National Electrical Code* permits a far broader range of materials that may be used as equipment grounding conductors, some with numerous conditions and therefore some of the methods of use appear to be fairly complex:

- Copper, aluminum or *copper-clad aluminum* conductors
- Rigid metal conduit
- *Intermediate metal conduit* (a type of conduit not recognized by the CE Code)
- Electrical metallic tubing
- *Flexible metal conduit when both conduit and fittings are listed for grounding* ("listing" is the American equivalent of the CE Code term "approval")
- *Flexible metal conduit unlisted for grounding* (when used with listed fittings, maximum 20-amperes circuit overcurrent protection, up to 1.8 m in length an installed for purposes other than to provide flexibility)
- *Flexible metal tubing with fittings listed for*

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#### ***"Smoke. . ." Continued from page 1***

As IAEI Divisions and Chapters, we can prepare each other by conducting workshops and seminars on properly applying codes, standards, and local state and federal laws. Division and Chapter can speak up as one body when something comes up that may seem little but can become big.

The International Association of Electrical Inspectors can continue participating in the code development process, developing training material and presenting those materials. IAEI can continue representing all enforcers at various forums and committees that further our electrical safety system and the electrical industry.

Well, enough rambling for this edition of the NEWS! Remain diligent for the little things before they become big!

Courtesy: "IAEI NEWS" September-October 2005

Continued on page 3. See "Bonding. . ."

**“Bonding. . .”** *Continued from page 2.*

- grounding (circuit protection up to 20 amperes and up to 1.8 m in length)
- *Armour of armoured cables* (when it is installed using methods so that it provides an effective fault path)
- Copper sheaths of mineral-insulated cables
- *Type MC metal-clad cables where listed for grounding* (using a combination of either bonding conductors and interlocked metal tape or bonding conductors and metallic sheaths)
- *Cable trays* (when identified for grounding purposes, of suitable cross-sectional area and so marked, with properly selected connections or bonding jumpers and maintained by qualified personnel)
- *Cablebus framework* (for branch circuits and feeders only)
- *Electrically-continuous metal raceways and auxiliary gutters listed for grounding*

As you will notice, our Canadian Electrical Code is more prescriptive and permits only a narrower range of methods for bonding electrical equipment and raceways.

The NEC is more objective based - it offers further ways of achieving the same result, but with lots of conditions. It also appears that the *NEC* provides more flexibility, but demands a more advanced level of knowledge when selecting and applying some of the available bonding options. Being more prescriptive, the CE Code is more rigid, offers fewer options, but more simple to interpret and apply. Which do you think is more practicable?

As with past articles, you should always consult with the local electrical inspection authority in each province or territory for a more authoritative interpretation of any of the above.

*Leslie Stoch, P.E. is principal of L. Stoch & Associates, providing electrical engineering and ISO 9000 quality systems consulting. Prior to that, he spent over 20 years with Ontario Hydro as an electrical inspection manager and engineer. Les holds a B.S. in electrical engineering from Concordia University in Montreal. Courtesy: IAEI NEWS, May-June 2005*

**HUMOUR**

**The Farmer**

A man owned a small farm that had been in his family for generations.

Employment Standards claimed he was not paying proper wages to his help and sent an agent out to interview him.

“I need a list of your employees and how much you pay them,” demanded the agent.

“Well, there’s my hired hand who’s been with me for 3 years. I pay him \$600 a week plus free room and board. The cook has been here for 18 months, and I pay her \$500 a month plus free room and board. Then there’s the half-wit that works here about 18 hours a day. He makes \$10 a week and I buy him a bottle of rye every week,” replied the farmer.

“That’s the guy I want to talk to: the half-wit,” says the agent. The farmer says, “That would be me.”

*Courtesy, : “The Conduit”*

**C.E.C. 20th Edition  
Coming, Fall , 2006**

Some Highlights

- 233 Changes
- 140 Amendments
- 5 New rules
- 3 New definitions
- 18 Amended definitions
- 13 Rules deleted
- 1 Table deleted
- Many changes to Sections 10 and 28

# Receptacle grades: What do they MEAN?

by Chuck Kurten, Underwriters Laboratories Inc.

In today's world there are so many different types of receptacles to choose from—straight blade, locking-type, and pin and sleeve.

The variety of straight blade receptacles offered by manufacturers alone is staggering—in fact, wiring device manufacturers produce and market more than a 1,000 different types. Differences include electrical ratings, color, style, sizes, and configuration. Receptacles are marketed using terms such as general grade, specification grade, heavy duty, industrial grade, commercial grade, residential grade, hospital grade, specialty grade, and fed spec. There are, however, only four receptacle identities that are specified in the Standard for Attachment Plugs and Receptacles. ANSI/UL 498 and CSA CAN/C22. No. 42-99, General Use Receptacles, Attachment Plugs and Similar Wiring Devices, Grade Designations, Marketing Information and Product Features

In these standards, straight blade receptacles are assigned four grades: general use, hospital, federal specifications (fed. spec.) and combination hospital/fed. spec. Each grade has its own distinct marking requirements. The standards do not acknowledge the other receptacle marketing designations (e.g. commercial grade or heavy duty). These designations represent the manufacturer's attempt to assist in the selection process of an appropriate straight blade receptacle based upon the intended usage and demands that may be placed on the device. While they may be helpful to the user, these designations generally have no impact on the safety requirements applicable to the receptacles.

Marketing designations are different from design features. Manufacturers also offer straight blade receptacles with a variety of special features. These features may include resistance to environmental conditions, tamper resistant construction, or isolated ground. For example, an isolated ground straight blade receptacle is offered in all the different grades—General Use, Hospital, Fed. Spec., and combination Hospital/Fed. Spec. The standards require additional investigation to address compliance of these special receptacle features.

### General Use Receptacles

General use receptacles are the most common found in the marketplace in both the United States and Canada. Receptacles that are found to comply by UL with safety standards within the U.S. and Canada are identified below.

General use receptacles are intended to supply a variety of electrical loads in general use, and are tested for plug configuration with the receptacle configuration is the key step in determining if the receptacle can handle the load. In this case, the receptacle has been evaluated to ensure it can handle the load whether it is a lamp, vacuum cleaner, heater, or other product.

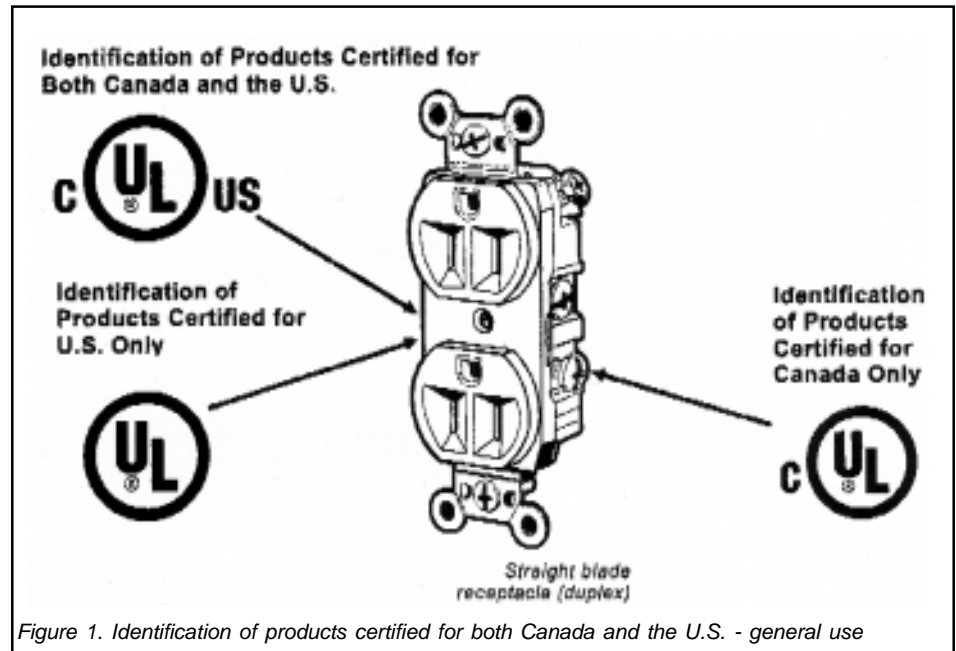


Figure 1. Identification of products certified for both Canada and the U.S. - general use

### Hospital Grade Receptacles

In addition to complying with the general use requirements, hospital grade receptacles are specially designed and are subject to additional requirements of the standards. These include additional grounding reliability, assembly integrity, strength and durability.

Hospital grade receptacles are offered in 15 A and 20 A straight blade of the ANSI/NEMA WD6 5-15, 6-15, 5-20, and 6-20 configurations. They are intended for use in accordance with the National Electrical Code, ANSI/NFPA 70, Article 517 (Health Care Facilities) in the United States and the Canadian Electrical Code, Part 1 CAN/C22.1.02, Section 24 (Patient Care Areas) in Canada.

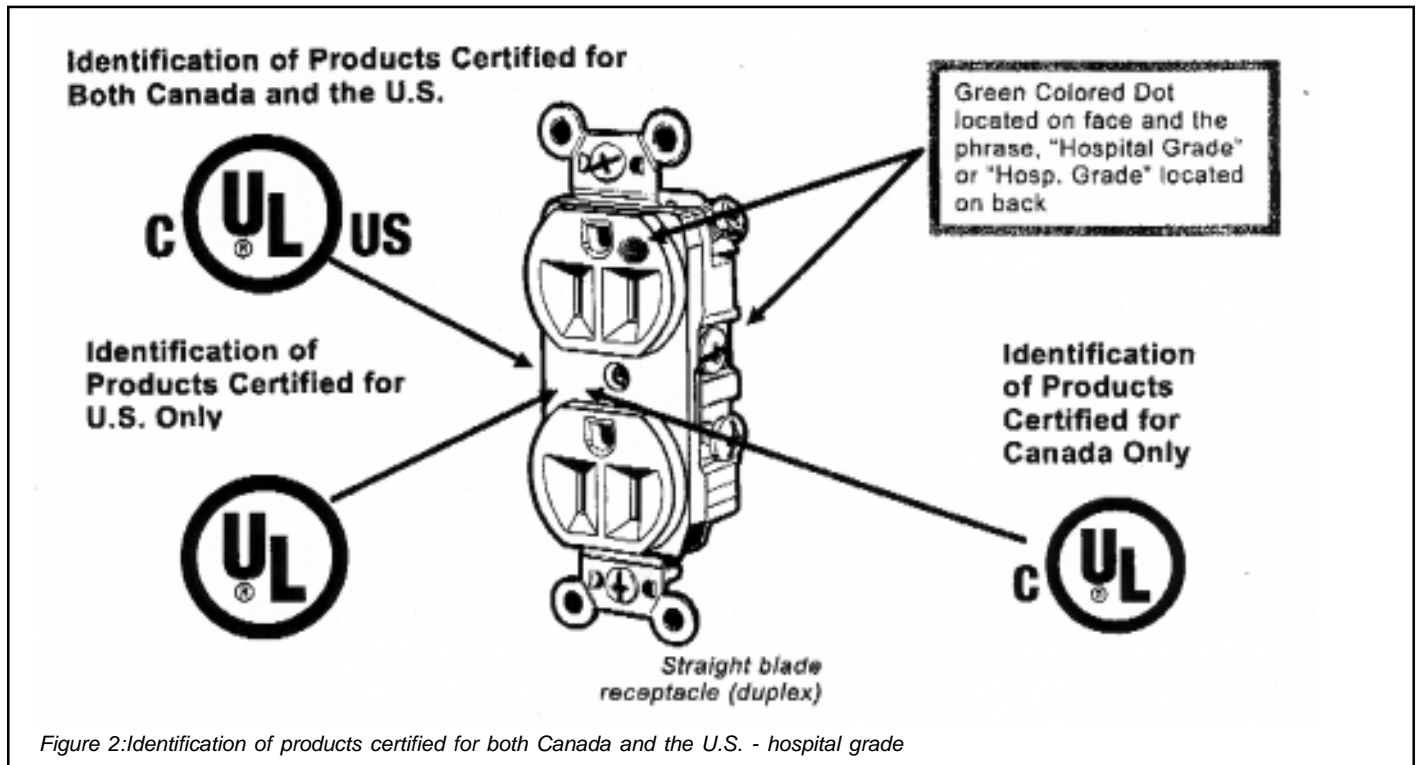
Continued on page 5. See: "Receptacles. . ."

**"Receptacles. . ."** Continued from page 4

Hospital grade receptacles have the same markings appearing on general use receptacles, but include additional markings denoting their intended use. These additional markings include the phrase "Hospital Grade" or "Hosp. Grade" appearing on the back of the receptacle

service life. Underwriters Laboratories is authorized to apply the federal specification verification mark.

The fed. Spec was created as a means to help government procurement personnel in obtaining the correct receptacle from suppliers. The fed. Spec. details

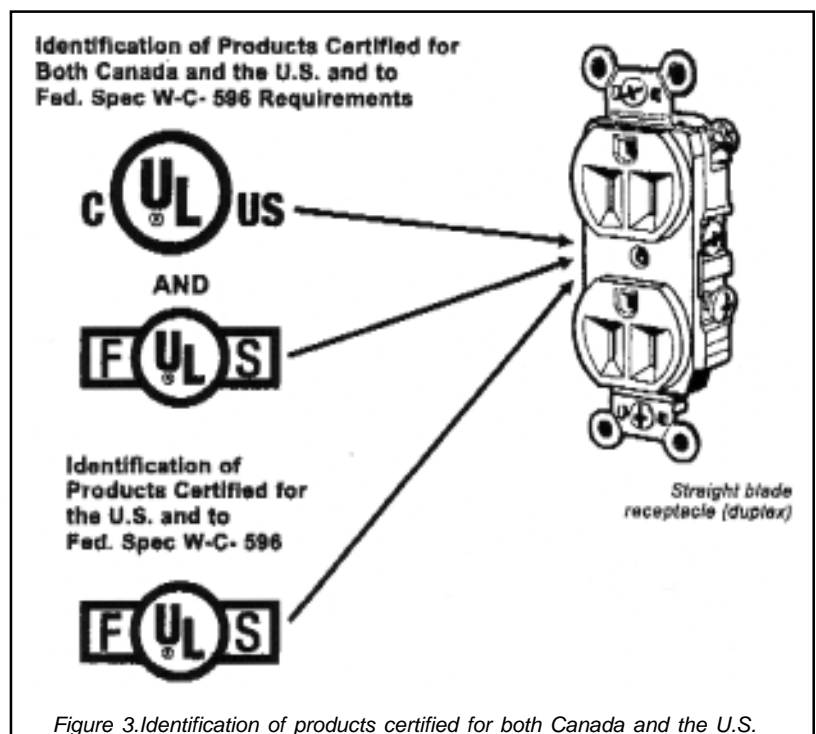


(where visible during installation with a cover plate secured as intended.

UL does offer listing to a special locking-type receptacle rated 20 A, 125 V. The identification is very similar except it is marked "Hospital only" with no green dot appearing on the face.

**Federal Specification General Use Receptacles**

In addition to complying with the general use requirements, fed. spec. receptacles have also been investigated for compliance with US Federal Specification W-C-596, "General Specification for Electrical Power Connectors." The Federal Specification W-C-596 is a document produced by the General Service Administration of the U.S. Federal Government. It identifies construction features, marking specifications and performance requirements beyond the requirements of the safety standards, for the purpose of durability and



Continued on page 6. See "Receptacles. . ."

configuration, electrical rating, type (single outlet or duplex) and even including the color of the outlet face, assigning a common descriptor. The receptacle industry adheres to this identification scheme in lieu of their usual catalog designations to facilitate government purchases.

Receptacles are identified by the federal specification verification mark, capital letters "F" and "S" each manufacturer may also indicate the federal specification number "W-C-596" or "W-C-596G" with the federal specification part number which consists of the appropriate specification sheet and dash number described in the smallest container in which the device is packaged. Other wiring devices eligible for fed. spec. rating include attachment plugs, cord connectors, (cable outlets) receptacles and male inlets. They are offered in both straight blade and locking-type configurations and an electrical rating ranging from 120 to 600 volts with current ratings up to 60 amperes and a frequency rating of 50/60 hertz.

### **Hospital Grade/Fed.Spec. Receptacles**

As the grade name indicates, hospital grade/fed.spec. receptacles have been investigated for compliance with fed.spec. hospital grade requirements. They too are identified by the capital letters "F" and "S" flanking the UL Listing Mark.

The manufacturer may also indicate the additional federal specification information on the device or on the smallest container in which the device is packaged. The phrase "Hospital Grade" or "Hosp. Grade" will appear on the back of the receptacle (where visible during installation) and a green dot will be present on the face, visible after installation with a cover plate secured as intended.

From time to time UL is asked the question—"What's the difference between a fed. Spec. and a combination hospital grade/fed.spec receptacle besides the addition of the green dot and hospital grade identifier?"

Although they seem to visually appear the same they are not. Each is investigated to a different set of performance and construction requirements. For example, a fed. Spec. receptacle is not subjected to the abrupt plug removal performance sequence of testing, whereas a hospital grade/fed.spec is subjected to this performance test sequence.

So, as a receptacle is being chosen or approved for an application, the decision making process should begin by identifying the appropriate grade (e.g., general use

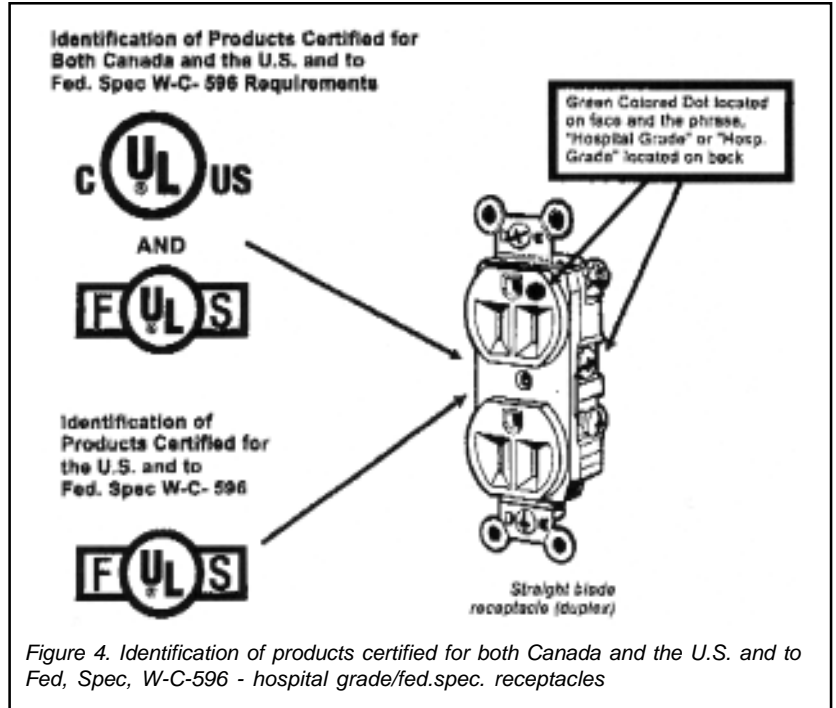


Figure 4. Identification of products certified for both Canada and the U.S. and to Fed, Spec, W-C-596 - hospital grade/fed.spec. receptacles

and features (e.g., tamper resistant) that conform with the safety standards and codes, and suit the particular installation. This information is different than the manufacturer's designations (e.g., heavy duty) intended to meet the user's preferences for the application.

For additional information please visit our web site at [www.UL.com](http://www.UL.com).

*Chuck Kurten is the principal engineer (PDE) for Wiring Devices & Components for Underwriters Laboratories Inc. He is a member of both domestic and international wiring device technical committees, including those of UL, CSA, CANENA, NEMA, IEC, IECCE CB CTL Task Force Expert and International Association of Electrical Inspectors (IAEI). He holds an AS in engineering science, B.S. in electrical engineering and a master's degree in business administration (MBA).*

Courtesy: IAEI NEWS January-February 2005

**Call for Nominations  
for the  
EIA Executive &  
Board of Directors**

**Elections, Monday February 27, 2006**

E-mail your nominations to Paul  
Stevens, [Paul.Stevens@earthtech.ca](mailto:Paul.Stevens@earthtech.ca)

The Electrical Inspectors Association once again had a great Christmas Dinner Meeting exchanged lots of door prizes. Along with the door prizes purchased by our association there were many prizes donated by some of our members and invited guests. This article is to show our appreciation to the following people and organizations for their generous support and participation with made the event another grand success:

Peter Murray-Driver, Abbey Group Contracting  
Dave Broadbent, Gescan  
Barry Hill & Randy De Gryp, Osram Sylvania  
Steve Mah, QPS Evaluation Services  
Bob Reimer, Future Tech Electric  
Nes & Rob Romaniuk, Elworthy Electric  
Onkar Singh Hundal, OJ Electric  
Francesco Perrizzolo, P & F Electric  
Wayne Kirk, Allan Bell & Associates  
John Reinders & Al Holmgren, Bridge Electric  
Mark Neath & Shaun Hollingsworth, Telus  
Wayne White, Inspector  
Kim Davies, Thomas & Betts  
Merv Usselman, Old Time Electric  
Ilie Baliban, Lion Canadian Contracting  
Warren Pow, IGA Dundarave  
Axel Gringmuth, ETS Electric  
William Kulsy, Intertek Testing Services  
Richard Campbell, ECABC  
Harold Steenson, retired  
Ryan Cartmell, Talon Electric



Fred Zurkirchen, Inspector  
Mauro Rubini, Panther Electric  
Tejinder Sira, Sira Electric  
Bill Strain, Villa Electric  
The Park Royal White Spot  
Brian Esau, Sabre Electric  
Gurmit Rooprai, Perma Electric  
Hossein Shirzad, Norgate Electric  
Carlo Turra, Inspector  
Lew Rogers, BCSA  
Jack Muir, retired  
Eric Sipila, Inspector  
Kerry Peterson, CSA  
Ark Tsisserev, Inspector  
Michael Atherley, Inspector



Guests enjoying the evening's events

Continued on page 8. See "Christmas Spirit"

# The Inspector

*"Christmas Spirit" continued from page 8*

The generosity of the group was highlighted when the money for the 50/50 draw for the Canuck Place fund raising was counted. Paul Stevens, one of Santa's elves, had sold \$477.00 worth of 50/50 tickets. The luckiest and most generous person at the meeting was Peter Murray-Driver. He won the \$238.50 draw prize. Without batting an eye Peter stood up and said he would like to donate his winnings to Canuck Place. What a great, great guy!

In closing, the executive would like to thank all those who attended the meeting and those who could not, but donated door prizes anyway, for their generosity. Also, a big "thanks" goes out to Santa Len and his elves for organizing this annual event. What would a Christmas Dinner Meeting be without them? Ho, ho, ho!



*Ssnta's helper with prise package*



*Roger Tuttle, EIA President, receiving coveted underarm valise from Santa's helper, Len Rhodes*

## Renewal Time!

According to the EIA records as of January 18, 2006, the following members have not yet renewed their membership. If you find your name on the list, and would like to

renew, just circle your name and return this page with your renewal fee of \$50.00 per year, Attention, Jack Ball, Treasurer.

Joe Amit  
 Michael Atherley  
 Gerry Bawol  
 Dennis Carlow  
 Andy Clevon  
 Don Daunais  
 Joe De Penrina  
 John Evans  
 Farmand Ghafari  
 Richard Hahn  
 Ed Hodson  
 Dan Janelle  
 Greg Lavia  
 Jeff Lueck  
 John McMahan  
 Doug Nott  
 Ken Petersen  
 Len Rhodes  
 Russell Roper  
 Guenter Schulze  
 Bill Simpson  
 Fred Zurkirchen  
 Roland Thiel  
 Merv Usselman  
 Wayne White

Ted Ashman  
 Jim Barker  
 Loris Bidese  
 Ron cheshire  
 James Cooper  
 Randy De Gryp  
 Herb Dierkhising  
 John Falkenholt  
 Doug Gillis  
 Warren Hancock  
 Shaun Hollingsworth  
 Michael Krygier  
 Scott Lecy  
 Greg Maxwell  
 Bob Moisey  
 Rein Paesuld  
 Kerry Peterson  
 Jack Robertson  
 Gabe Rosati  
 Mike Shanon  
 Eric Sipila  
 Derek Stone  
 Andrew Thornley  
 Martin Van Der Horst  
 Randy Wryhya

Dwayne Askin  
 John Baron  
 Kenneth Buhr  
 Christian Christopherson  
 Robert Cornwell  
 Robb De Lazzari  
 Brian Esau  
 Rafael Ferrer  
 Keiller Gowans  
 David Hansen  
 Dave Jackson  
 William Kulsky  
 Neill Long  
 Rick May  
 Ken Neilsen  
 Mariusz Pawlak

Vince Pietracupa  
 Gurmit Roprai  
 Don Santolla  
 Ted Simmons  
 Ian Skedd Bill Strain  
 Vincent Yu  
 Kurt Wensler

### ***Has anything changed?***

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Company or Employer: \_\_\_\_\_

Phone: \_\_\_\_\_ E-mail: \_\_\_\_\_

The year 2006: One year membership : \$50.00

The years 2006 & 2007: Two year membership:\$100.00

The three year membership dues will be \$150.00

**Mail to Jack Ball, Treasurer,  
 EIA of BC, 201 - 3989 Henning Drive, Burnaby, B.C., V5C 6N5**

**EIA Board of Directors**

**Executive**

**President**

Roger Tuttle, City of Vancouver  
 roger.tuttle@vancouver.ca  
 604-873-7601

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 rporcina@dccnet.com

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 City of North Vancouver  
 jball@cnv.org  
 604-983-7378

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George Razzo, Electrical Safety  
 leachtown@shaw.ca  
 604-795-8470

**Recording Secretary**

Ted Simmons, BCIT  
 tsimmons@bcit.ca  
 604-453-4045

**Directors**

Richard Campbell, ECABC  
 rcampbell@eca.bc.ca

Bob Cornwell, City of Vancouver  
 bob.cornwell@vancouver.ca  
 bob.cornwell@shaw.ca

Kerry Peterson, CSA  
 kerry.peterson@csa-international.org

Mauro Rubini,  
 Panther Electric Ltd.  
 604-251-2515  
 Pager: 604-686-0747

Paul Stevens, EarthTech  
 Paul.Stevens@earthtech.ca

**Past President**

Dave Shavalier, Electrical Safety  
 Chilliwack, 604-795-8403  
 DaveShavalier@safetyauthority.ca  
 david\_s@uniserve.com

**Editor:** Pat Maertz, 604-855-7363

**EIA ANNUAL GENERAL MEETING**

**Monday, February 27, 2006**

**“Cheers Restaurant”**  
**125 East 2nd Street, North Vancouver**

**Social Hour: 5:00 - 6:00 p.m.**

**Dinner: 6:00 - 7:00 p.m.**

**Meeting: 7:00 - 9:00 p.m.**

**Presentation**  
**Counterfeit Breakers**  
**Gerald Arksey P.Eng.**

*Please confirm your dinner reservation  
 by calling: Dwayne Asking: Phone: (604)  
 660-0885;*

*Fax (604) 660-0187 before Thursday,  
 February 23*

**MEMBERSHIP APPLICATION & RENEWAL FORM**

**Please accept my application for membership in the EIA of BC**

Name (Please print) \_\_\_\_\_ Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ Postal Code \_\_\_\_\_

Employer \_\_\_\_\_ Title \_\_\_\_\_

e-mail \_\_\_\_\_

New Membership  Renewal

Inspector  Associate

Enclosed is: \$50.00 for 1 year (Jan 1, 2006- Dec. 31, 2006)

\$100.00 for 2 years (Jan 1, 2006- Dec. 31, 2007)

\$150.00 for 3 years (Jan 1, 2006- Dec. 31, 2008)

**Mail to: The EIA of BC, 201 - 3989 Henning Drive, Burnaby, B.C., V5C 6N5**

*Don't forget to*

*renew your*

*membership for 2006*