

BC Safety Authority Launches Campaign to support Licensed Contractors

November, 2007



BC Safety Authority educates homeowners about unsafe gas and electrical home renovations

(NEW WESTMINSTER, B.C.) – The popularity of do-it-yourself projects coupled with BC’s construction boom means more homeowners are doing their own renovations, or hiring unqualified people to do the work for them. What most homeowners don’t realize is that electrical and gas installations pose some of the greatest safety risks. To raise awareness

(Continued on page 4)

Inside this issue:

BC Safety Authority	1
2006 Electrical Code Revisions	1
Understanding Circuit Rating & Loading	2
IAEI Meeting Update	3
Christmas Reminder	6
President’s Message	11
Christmas Meeting Notice	12

The Continuation of 2006 Electrical Code Revisions

By: Ted Simmons, Chief Instructor, BCIT



The safety of modern electrical installations is a direct result of new and improved materials and installation practices as well as a continuous upgrading of Codes and Standards to reflect new technologies. In order to provide the electrical industry with the opportunity to take advantage of the new technologies, CSA has decided to embark on a 3 year Code cycle with an updated edition of the CEC scheduled to be issued in 2009. In addition to providing a more up to date Code, this new time line will promote harmonization with the NEC's 3 year cycle. In the meantime we will continue our focus on the changes that have been incorporated into the 2006 CEC. This article, the sixth in a series, will review the changes made to Sections 38 - 68.

(Continued on page 5)

Canadian Section & Ontario Chapter 2007 IAEI Trade Show & Convention (September 21 – 23, 2007)

By: Bob Cornwell , Vice-president

This year's International Association of Electrical Inspectors convention took place at Blue Mountain, just outside of Collingwood Ontario. I attended the conference to represent the EIA of BC on behalf of our President, Dave Shavaliar.

Trade Show exhibitors included CSA Group, Intertek-ETL SEMKO, UL, ULC, Ferraz Shawmut, Hydel, Ideal, Schneider, T&B, and United Wire & Cable.

The theme of the Delegate Program was "green" as the presentations and workshops dealt with Photo Voltaic Systems, Wind Turbine Technology, and Interconnection of Electric Power Production Sources.

Both "Micro" and "Macro" solar technology was discussed. Micro solar systems connected to net metering devices was a timely and relevant topic due to homeowner subsidies being made available by Ontario Hydro. (homeowners are being paid up to \$0.48 a kilowatt hour for solar generated power) A demonstration of macro PV systems that integrate the walls and roofs of buildings was presented by Dave Beckam of Solarity Industries Inc.

A seminar on Wind Turbine Technology was presented by Michael Frydensbjerg of Siemens Canada. Michael traveled from Finland (where 20% of grid power is wind generated) to make his presentation. With blades up to 50m long, and towers 120m high, the sheer size of these wind turbines makes offshore



installation attractive due to transport/construction strategy as well as a land use/noise pollution issues.

A report from the Journal of Geophysical Research sees 72 million gigawatts as the ultimate capacity of wind power world-wide, five times the world consumption of energy of all types in 2002. China, already a world leader in the widespread use of solar water heaters, is set to become leader in wind power turbines also, and is already driving down wind turbine prices.

One of the main trends in turbine development is increased size and rating for offshore installations; other continuing trends are variable-speed operation and the use of direct-drive generators. Principal associated developments are:

- Resource evaluation (wind measurements, modeling).
- Standards and certification. Improved aerodynamic efficiency.
- Cost reductions (value engineering, component development).
- Advanced turbine development (new concepts).

In addition to increasing installation of turbines offshore in Europe, the development of offshore sites is advancing in the United States and Canada.

A seminar on CEC Section 84 (Interconnection of electric power production sources) was presented by James Fraser, who is the Technical Advisor for the Ontario Electrical Safety Authority. James did a very thorough job of bringing together both micro and macro electrical generation systems to the utility grid, their respective points of demarcation, and the prohibition of backup systems for micro PV systems tied to net metering devices in Ontario. The latter is to prevent the PV system owner from "selling" inverted battery power to the utility. James's experience with wind turbine installations in Ontario revealed that the output voltage can be as high as 660V and 1000v rated equipment would be required.

Besides the trade show and seminars taking place at the convention, the Canadian & Ontario Sections of the IAEI held meetings and nominated new executives boards.

Ark Tsisserev (past President of EIA BC) is the newly elected President of the Canadian Section. Congratulations Ark!

Bob Cornwell is the Training and Quality Control Coordinator for the City of Vancouver Electrical Branch. Bob also serves on the Executive Board of EIA BC as Vice President.

Note from the Editor; - Bob Cornwell accepted nomination to the Canadian Section Executive Board as an Officer – representing inspectors. This nomination was made after the general meeting of the Canadian section, and Bob's formal election to the Board will be conducted during the next year conference. Congratulations on your nomination.

The INSPECTOR NEWSLETTER— NOVEMBER 2007

(Continued from page 1)

about this safety concern, the British Columbia Safety Authority has launched its *Heads Up for Safety* campaign province wide to educate homeowners about the importance of hiring licensed contractors and ensuring the necessary permits are obtained for electrical and gas renovations.

“Homeowners don’t always appreciate the complexity of gas and electrical work,” explained Pearse Walsh, the BC Safety Authority’s business development leader. “Nor do they realize why it is so important that they deal with a licensed contractor as opposed to someone operating outside the regulations. There are good reasons we license contractors in British Columbia, and they are all based on ensuring safety.”

All gas and electrical contractors doing regulated work in BC are required, under the Safety Standards Act, to hold a valid licence issued by the BC Safety Authority. Contractors must meet certain qualifications to be licensed, including a \$10,000 surety bond and hiring qualified trades people (or, in the case of an independent, being a qualified tradesperson). Licences must be renewed annually. Permits are required by law for any renovations involving regulated electrical and gas work.

The campaign is supported by a number of organizations, including the Electrical Contractors Association of BC. Richard Campbell, Executive Director of the Association, noted, “The ECA is proud to support this initiative. Our members are highly skilled professionals, dedicated to doing the best work in the safest possible way. We see the ‘Heads Up’ campaign as helping us differentiate our mem-

bers, and other licensed electrical and gas contractors in BC, from those who don’t play by the rules and potentially put homeowners at great risk.”

The campaign features television advertising and print materials illustrating the absurdity of parents making everyday safety equipment, such as car seats and helmets, for their children, and poses the question, “You wouldn’t make your child’s helmet (or car seat) would you?”

In the Okanagan Valley, where the campaign was launched as a pilot project this past spring, many contractors now attach the Safety Authority’s campaign brochure to their esti-

(Continued on page 6)

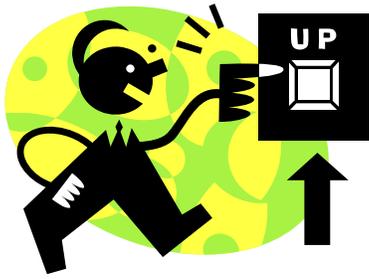


A BC Safety Authority Safety Officer inspects an electrical panel. Any renovations involving a home’s electrical panel require permits and should be handled by a contractor licensed by the BC Safety Authority.

(Continued from page 1)

Section 38 - Elevators

Rule 38-005 Working clearances.



Elevators and similar equipment are required to be serviced and maintained by qualified personnel only and the Code has exempted these installations from

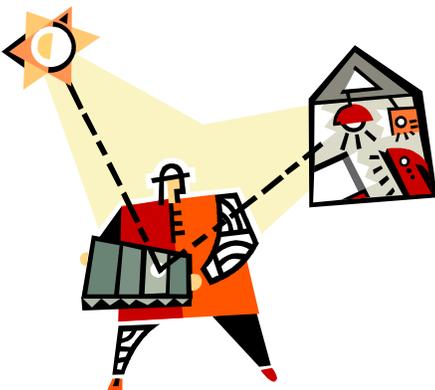
the working space requirements identified in Rule 2-308(1). Rule 38-005(2) has been revised and has now extended this exemption to the 2 metre headroom requirement identified in Rule 38-005(1). It should be noted that to be exempt from the working space requirements, elevator and similar installations must comply with the requirements outlined in Rule 38-005(2).

Section 46 - Emergency Systems

Rule 46-202(3) has been revised to include a new subrule "c" which requires generators used for emergency supply to be in conformance with CAN/CSA - C282 Emergency Electrical

Power Supply for buildings. It is important to note this subrule makes an exception for generators installed in health care facilities which must be installed in accordance with CAN/CSA-Z32.

Section 50 - Solar Photovoltaic Systems



Rule 50-004 - The former subrule, "2" which identified the marking requirements for the power conditioning unit has been deleted. The marking requirements for power conditioning

units are a Part II requirement and are included in CSA C22.2 No.107.1-01.

Rule 50-012(3) - The voltage level where a means of isolation must be provided for a photovoltaic

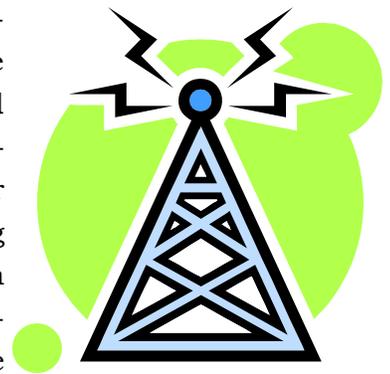
output circuit has been increased from 30V to 50V. In addition the voltage level is now based on the rated voltage of the photovoltaic output circuit as defined in Rule 50-006.

Rule 50-020 - Interconnected System Connection

Subrule 2 has been added to ensure that power conditioning units used for interconnection must be approved for this specific purpose. In addition, as noted in Rule 50-020(1), the connection from the power conditioning unit to the supply authority of an interconnected system must be in accordance with Section 84.

Section 54 - Community Antenna Distribution And Radio And Television Installations

Rule 54-702(f), - A new subrule (f) has been added to identify the requirements for raceways entering a building from an underground distribution system. The



The new subrule requires the raceways to be sealed to ensure moisture and gas will not enter the building. If possible the raceway should enter the building above grade. Where this is not possible the raceway shall be suitably drained.

Section 60 - Electrical Communication Systems

Rule 60-400 - Communication Equipment in Bathrooms and Areas Adjacent to Pools

A new subrule 3 has been added to indicate that communication equipment located in areas adjacent to pools must be installed in accordance with the requirements outlined

(Continued on page 9)



Reminder our Christmas meeting is coming up and be sure to book your seat now. Your participation and generosity at our Christmas Meeting



has been very gratifying to those that have participated. Our Charities and Santa Christmas Draw have been a outstanding success and look forward to another successful dinner. So bring your donation for the Draw table and your generosity for our Charities. See All There.



(Continued from page 4)

mates.

“It signals to the homeowner that the contractor is properly licensed and that the job will be permitted if required by law,” continued Walsh. “It lets the homeowner know the contractor they are considering takes his or her legal and professional obligations – and the homeowner’s safety – seriously.”

The Safety Authority now lists all licensed electrical and gas contractors on its website, www.safetyauthority.ca, and is asking homeowners to visit the site to verify if contractors they are considering are licensed. Homeowners can also call the Safety Authority at 1-866-566-SAFE (7233).

“We know there are contractors out there who aren’t licensed and don’t get permits,” continued Walsh. “This campaign helps support legitimate contractors by informing homeowners how to verify if their contractor is licensed and what to ask the contractor about permits. It’s levelling the playing field.”



The British Columbia Safety Authority is an independent, self-funded corporation that provides cost effective and essential safety services to business, industry and the general public throughout the province.

The Old Dog

A wealthy old lady decides to go on a photo safari in Africa, taking her faithful, elderly poodle named Cuddles, along for the company.

One day the old poodle starts chasing butterflies and before long, Cuddles discovers that he's lost. Wandering about, he notices a leopard heading rapidly in his direction with the intention of having lunch.

The old poodle thinks, "Oh, oh! I'm in deep doo-doo now!" Noticing some bones on the ground close by, he immediately settles down to chew on the bones with his back to the approaching cat. Just as the leopard is about to leap the old poodle exclaims loudly, "Boy, that was one delicious leopard! I wonder if there are any more around here?"

Hearing this, the young leopard halts his attack in mid-strike, a look of terror comes over him and he slinks away into the trees. "Whew!" says the leopard, "That was close! That old poodle nearly had me!" Meanwhile, a monkey who had been watching the whole scene from a nearby tree, figures he can put this knowledge to good use and trade it for protection from the leopard. So off he goes, but the old poodle sees him heading after the leopard with great speed, and figures that something must be up.

The monkey soon catches up with the leopard, spills the beans and strikes a deal for himself with the leopard.

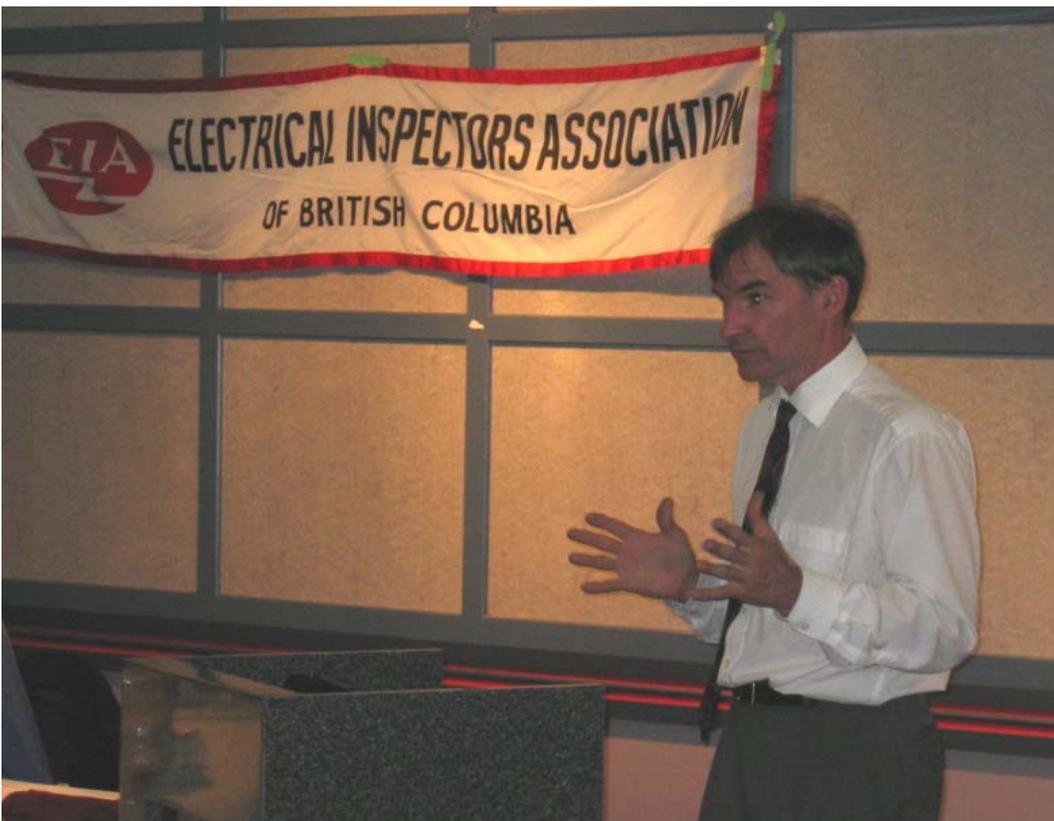
The young leopard is furious at being made a fool of and says, "Here, monkey, hop on my back and see what's going to happen to that conniving canine!"

Now, the old poodle sees the leopard coming with the monkey on his back and thinks, "What am I going to do now?", but instead of running, the dog sits down with his back to his attackers, pretending he hasn't seen them yet, and just when they get close enough to hear, the old poodle says...

"Where's that damn monkey? I sent him off an hour ago to bring me another leopard!"

Moral of this story....

Don't mess with the old dogs...age and skill will always overcome youth and treachery! Bullshit and brilliance only come with age and experience



Guest Speaker Brian Cook, President of "Power Check" presenting an interesting approach to the Electrical Safety requirements for older homes that still have Knob and Tube wiring. He has captured the Insurance Companies attention with his approach to the evaluation of risk of these older homes and made some very convincing arguments to those in attendance.

The INSPECTOR NEWSLETTER— NOVEMBER 2007

(Continued from page 2)

- 1) a total of more than 1 hour in any two-hour period, provided that the value of the load does not exceed 225A; or
- 2) a total of more than 3 hours in any six-hour period, provided also that the load does not exceed 225A.

It is interesting to note that the Code allows loads of a dwelling unit to be treated as non-continuous loads for the purpose of Rule 8-104. This consideration is provided by Rules 8-200(3) and 8-202(2) of the CE Code. All other loads, however, are deemed to be continuous, unless provisions allowed by Subrules 8-104(3)(a) or (3)(b) could be demonstrated to the AHJ.

Thus, when a load calculation is done for a single dwelling (Rule 8-200), and the calculated load, for example yields 92A, then in accordance with Subrule 8-104(2) the ampere rating of the service can be chosen by selecting standard values of the o/c device and the ampacity of the service conductors which are not less than the calculated load. It is obvious that the ampere rating of the consumer service, for this example, would be 100A. The service conductors would be selected based on this calculated load from Tables 1-4 accordingly. If for the purpose of this example Table 4 is used to select the service conductors, the Code users should note that although the ampacity of No. 2 AWG AL conductors is shown in Column 4 of Table 4 as 95A, Note ** on this Table indicates that when this conductor size is used to supply single dwellings, the ampacity of No. 2 AWG AL conductors in a 3-wire 120/240V or 120/208V service is considered to be 100A. So, No. 2 AWG AL could be used for this service - to supply the non-

continuous calculated load of the single dwelling.

Now let's deal with those loads that are considered to be continuous. In this case two options are entertained by the Code.

The first option is provided by Subrule 8-104(4). This Subrule governs those situations when the o/c device in a service box, switch, or in a combination panelboard is specifically marked for continuous operation at 100% of this o/c device rating. From a practical point of view this means that each o/c is specifically designed, constructed and tested for 100% continuous operation of its ampere rating. In this case, Subrule 8-104(4) allows us to select the rating of the circuit (feeder, service) protected by such o/c devices based on the 100% of the rating of the circuit (based on the applied calculated load similarly to the example above for a single dwelling), provided that the ampacity of conductors is chosen in accordance with Table 2 or 4. If, however, the Code user intends to apply Table 1 or 3 (free air rating) for selection of the circuit conductors, then respectively the continuous load as determined from the calculated load cannot exceed 85% of the circuit rating. For example, if a branch circuit carrying a continuous calculated load of 85A is intended to be protected by the o/c device marked for continuous operation at 100% of its rating, and conductors are intended to be selected based on Table 2, then the o/c device with the standard setting of 90A (see Table 13) could be installed, and No. 4 AWG Copper (85A) could be selected from Column 4 of Table 2.

If, for example Table 1 is intended to be used (free air rated conductors), then the o/c device marked for continuous operation at 100% of its rating must be not less than 100A; and a No 6 AWG copper conductor shall be chosen from Column 4 of Table 1.

The second option is described by Subrule 8-

(Continued on page 10)

(Continued from page 5)

in Rule 68-070.

Rule 60-600 - Direct Buried Systems

The first sentence of this rule has been revised to indicate that for direct burial installations the conductors as well as the cable assemblies must be suitable for direct burial.

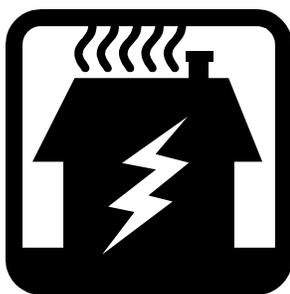
Rule 60-602 - Underground Raceway

Subrule "(e)" has been revised to ensure the entire cable and not just the sheath is suitable for wet locations.

Subrule "(f)" has been added to identify the requirements for raceways entering buildings from an underground installation. The new subrule requires the raceways to be sealed to ensure that moisture and gas do not enter the building. If possible the raceway should enter the building above grade. Where this not possible the raceway shall be suitably drained.

Section 62 - Fixed Electric Space And Surface Heating Systems

Rule 62-108 - Branch Circuits



In subrule 3 the term "lampholder" has been replaced with the term "luminaire", which is defined as a complete lighting unit designed to accommodate lamp(s) and to connect the lamp

(s) to the circuit conductors. It should be noted it is proposed to replace the term "lampholder" with the term "luminaire" throughout the entire CEC Part I.

Rule 62-214- Installation of Heating Panels & Heating Panel Sets

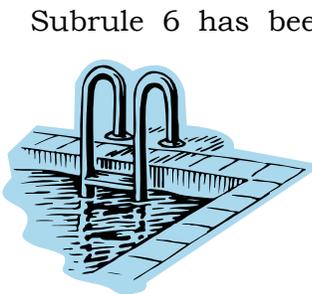
The former subrule "(2)" which identified temperature limitations for heating panels and heating panel sets was deemed to be unenforceable and has been removed.

Rule 62-300 - Electric Surface Heating

In the previous Code, ground fault protection was not required for heating cable, and heating panels installed under the surface of driveways, sidewalks and similar locations. This is no longer the case and subrule 4 has been revised and now requires ground fault protection for all electric surface-heating systems.

Section 68 - Pools, Tubs, And Spas

Rule 68-058 - Bonding to Ground



Subrule 6 has been revised to clarify that the bonding conductor attached to the deck box referred to in Rule 68-060 may be run to the panelboard supplying the pool equipment instead of the main distribution panelboard.

Rule 68-070 - Other Electrical Equipment

Two new subrules have been added to identify the requirements for communication equipment installed within 3 metres of the inside walls of a pool. Subrule (2) requires the communication equipment to be permanently fixed on the wall and located that no part is within 1.5 metres of the inside walls of the pool or can be used from the pool.

Rule 68-300 - General

This rule has been revised to recognize the use of cord-connected hydromassage tubs.

Rule 68-306 - This rule has been added to identify the requirements pertaining to the receptacle to supply a cord-connected hydromassage tub. The receptacle shall be located not less than 300mm from the floor and shall be inaccessible to the hydromassage bathtub occupant. A new note identifying the labeling requirements for the receptacle has been added to Appendix "B".

Rule 68-404 - Control, and Other Electrical Equipment

Subrule 4 was added and the Code now requires an emergency shutoff switch be installed for each

(Continued on page 11)

The INSPECTOR NEWSLETTER— NOVEMBER 2007



(Continued from page 8)

104(5). This subrule governs those cases (the most common), where the o/c device protecting the circuit (service, feeder) is not specifically marked for continuous operation at 100% of its rating (when an o/c device was designed, constructed and tested for continuous operation at 80% of its ampere rating). In this case the continuous load as determined from the calculated load cannot exceed 80% of the rating of the circuit if ampacity of the circuit conductors are based on Table 2 or Table 4. For example, a circuit rated at 200A can not be used for supply of a continuous calculated load in excess of 160A.

If, however, Table 1 or 3 is used for selection of conductors (free air ampacity), then the continuous load as derived from the calculated load can not exceed 70% of the ampere rating of the circuit. In this case, a continuous load of a typical branch circuit rated at 200A (the o/c device rated at 200 A and the conductors with ampacity at 210A selected based on Table

2) can not exceed 140A.

Rule 8-104 applies conditions that are outlined in Subrule (4) and (5) as a benchmark for all other calculations, where applicable derating factors are used to reduce the conductor ampacity [see Subrules 8-104(6) and (7)].

It should be also noted that another main principle that establishes a relationship between ampacity of circuit conductors and the rating/setting of the o/c devices protecting these conductors is described in Rule 14-104. This Rule states that “the rating or setting of overcurrent devices shall not exceed the allowable ampacity of the conductors that they protect”, unless otherwise permitted by Table 13 or other Rules of the Code [i.e. Rules such as 26-208 and 26-210; 28-106 and 28-200; 32-200 and 32-206; 62-114(7), etc.].

Hopefully this article clarifies the “mystery” behind circuit loading. In each particular case, however, specific concerns and questions related to this subject should be discussed with the authorities enforcing the CE Code.

Arkady (Ark) Tsisserev, is the Electrical Safety Manager/Chief Electrical Inspector for the City of Vancouver. He is a registered Professional Engineer with a Master's degree in electrical engineering. Ark is the Chair of the Technical Committee for the CE Code, Part I. He can be reached at :



arkady.tsisserev@vancouver.ca.

(Continued from page 9)

spa or hot tub, (except for spas or hot tubs installed in dwelling units). The purpose of the switch is to prevent entrapment hazards that may occur during the use of the spa or hot tub. The switch must be installed in accordance with the requirements of items (a) through (e) inclusive.

A new note has been added to Appendix "B" to provide further information on this requirement. Review of the changes to the 2006 Canadian Elec-

trical Code Part I will continue in the 2008 issue.



Ted Simmons is Chief Instructor, Electrical Apprenticeship Program at the British Columbia Institute of Technology. Ted can be reach, by e-mail at Ted_Simmons@bcit.ca.



Presidents Message



As we glance to the stars on any given night to ponder whether the heavens will bear an El Nino or El Nina winter; all we know for sure right now that winter is on its way. Summer, or what we had of it, left

on its journey elsewhere.

We have had our successes and our failures this year. One of the most interesting failures was our proposed seminar on Arc Flash. Anyone who has stuck a screwdriver in an electrical panel while looking elsewhere knows what Arc Flash is! It's generally the loss of the working end of your screwdriver and most of the hair on your knuckles! For most it just means buying a new tool on your next trip out. But depending upon the voltage and distance from the incident, more serious consequences can result. We partnered with a number of affiliated organizations, also concerned with safety, and we took the lead to try and present a June information seminar to the trade. Due to extremely poor response we were forced to cancel the seminar and scratch our heads as to why there was little expressed inter-

est. Let's go back and blame the June weather and we will maybe offer this seminar again in the future. Many thanks to our tireless Executive for all their diligent efforts in putting the necessary planning together. In the future, we will re-evaluate offering this subject again.

On a more positive note, one of our interesting successes is how our Executive melds together. Each and every one digs in and assists in every task and all offer timely and sagely advice. Our organization would flounder and disappear without these dedicated professionals.

I look forward to seeing you all at our Christmas Dinner meeting scheduled for November 26th. Until then, on behalf of the Executive, I would like to wish you all happiness and prosperity.

With warmest regards,

David N. Shavalier
President



EIA Executive

President

Dave Shavaliar, BC Safety Authority, Chilliwack
604-795-8403
DaveShavaliar@safetyauthority.ca
david_s@uniserve.com

Vice President

Bob Cornwell,
City of Vancouver
bob.cornwell@vancouver.ca
604-873-7572

Treasurer

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

Membership Secretary

George Razzo, BC Safety Authority, Chilliwack
leachtown@shaw.ca
604-795-8470

Recording Secretary

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

Directors

Richard Campbell, ECABC
r.campbell@eca.bc.ca

Ken Cornwell, BC Safety Authority, Squamish
Ken.Cornwell@safetyauthority.ca

Farmand Ghafari, City of Burnaby
farmand.ghafari@burnaby.ca

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

Rick Porcina, City of Surrey
rporcina@dccnet.com

Eric Sipila, City of Burnaby
eric.sipila@city.burnaby.bc.ca

Past President

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

Editor: Rick Porcina,
Email: info@eiabc.org

The Electrical Inspectors' Association
of British Columbia
Suite 201, 3989 Henning Drive
Burnaby, B.C.
V5C 6N5
Fax: 604-294-4120
E-mail: info@eiabc.org

ELECTRICAL INSPECTORS' ASSOCIATION of B.C. GENERAL MEETING

Monday, November 26, 2007

"Cheers Restaurant"

125 — East 2nd Street, North Vancouver, B.C.
(just off Lonsdale Avenue)



SOCIAL HOUR: 5:15 — 6:00 p.m.
DINNER: 6:00 — 7:00 p.m.
MEETING: 7:00 — 9:00 p.m.

Dinner: \$25

"Christmas Draw"

Most Important for Reservations: Please Phone Dwayne Askin
(604) 660-0885 or Email: Dwayne.Askin@safetyauthority.ca

**WE COULD USE YOUR HELP TO MAKE OUR CHRISTMAS
DRAWS EFFECTIVE. Donations gladly accepted . . .**

Membership Application & Renewal Form

Please accept my application for membership in the EIA of B.C.

- | | |
|---|-----------|
| <input type="checkbox"/> For 1 year (Jan 1, 2007—Dec. 31, 2007) | \$ 50.00 |
| <input type="checkbox"/> For 2 year (Jan 1, 2007—Dec. 31, 2008) | \$ 100.00 |
| <input type="checkbox"/> For 3 year (Jan 1, 2007—Dec. 31, 2009) | \$ 150.00 |

New Membership

Name (Please Print)

Renewal

Address

Inspector

City

Postal Code

Associate

Company

Title

Phone

Fax

Email

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