

May, 2006

Emergency Lighting & Exit Signs **Application & Installation Requirements**

By Ark Tsisserev, P.Eng.

Application of certain types of electrical equipment may be governed by codes, other than the Canadian Electrical Code (CEC). Emergency lighting and exit signs are good examples of such types of equipment.

In fact, the scope of Section 46 of the CEC, Part 1 states that this Section applies to installation, operation and maintenance of emergency lighting and exit signs that are required by the National Building Code of Canada (NBCC). Although the scope of Section 46 covers other types of emergency equipment and systems, this article concentrates only on emergency lighting and exit signs. It is important to note that even if the emergency lighting and exit signs are not necessarily required by the NBCC, Inspectors' viewpoint is that if this equipment is installed it must comply with the installation requirements of the CEC (bonding, wiring methods, selection of the o/c protection, conductors sizes, etc).

However, before we analyze provisions of Section 46 for installation and operation of the emergency lighting and exit signs, it is beneficial to visit applicable sections of the NBCC that regulate application requirements for this electrically connected life and fire safety equipment.

Let's start with the emergency lighting.

Article 3.2.7.3 of the NBCC mandates that the emergency lighting must be provided in the following areas:

1. Exits
2. Principal routes that constitute access to exits in an open floor area
3. Corridors used by the public
4. Corridors serving patient's sleeping rooms
5. Corridors serving classrooms
6. Underground walkways
7. Public corridors
8. Floor areas or parts of such floor areas where public may congregate in
 - (a) theatres, movie houses and similar occupancies, where house lights are turned off or dimmed during a performance or

- (b) schools, assembly halls, churches, restaurants, meeting rooms, arenas and other such similar occupancies, if such occupancies have occupant load of 60 or more persons.

This information is essential to the designers of emergency lighting. It allows them to understand with full certainty, where the emergency lighting must be installed. The NBCC also prescribes when such emergency lighting must be actuated, how it must perform and what power source must be used for the emergency lighting systems and equipment.

Article 3.2.7.4 of the NBCC states that an emergency power supply must be provided from a power source such as batteries or generators to maintain emergency lighting in each area listed in Article 3.2.7.3 when the normal power supply to that area is interrupted. The NBCC also mandates that the emergency power supply must be designed and installed so that it is : (a) automatically actuated upon failure of the regular power and (b) capable to perform for at least 30 minutes in each required area.

In a building that is classified as a hospital or a jail, the emergency lighting must function for at least an hour, and if the building is classified as a high building, then the emergency lighting must operate for a least two hours.

It is important to note that terms "exit," "floor area," "public corridors," used in Article 3.2.7.3 are defined in the NBCC, and that the designers of emergency lighting must be cognizant of the extent of these definitions. For example, "Exit means that part of a means of egress, including doorways, that leads from the floor area it serves, to a separate building, an open public thoroughfare, or an exterior open space protected from fire exposure from the building and having access to an open public thoroughfare."

Why is this definition important to the electrical designers and contractors? Because it will help them to understand that depending on the building design, an

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“exit” can include outside open spaces which will also require provisions for normal and emergency lighting. Therefore, electrical designers and contractors must consult with the building code practitioners to establish the boundaries of the exits in each specific project. This approach will assist them to accurately identify the areas where emergency light systems and equipment must be installed under requirements of section 46 of the CEC.

Now, we are in a familiar territory. Rules of Section 46 will have to be followed for installation of emergency lighting systems (Rule 46-200) and unit equipment (Rule 46-300), and for wiring methods (Rule 46-108).

Let’s now look at exit signs. Article 4.64.5.1 (2) of the NBCC mandates that every exit sign shall be illuminated continuously while the building is occupied. The NBCC considers two types of illuminated signs: internally illuminated (i.e., an exit sign is in essence a luminaire), and externally illuminated, when illumination of an exit sign is provided by normal or emergency lighting in the area where such exit sign is installed. Thus, regardless whether illumination of an exit sign is provided by an electrical circuit directly supplying this sign (internally illuminated) or by electrical circuits supplying lighting in the area where an exit sign is installed (externally illuminated), Such sign must be illuminated continuously. This means that the emergency power for emergency lighting, as discussed earlier, must be provided for illumination of an exit sign.

The NBCC also lists mandatory locations for exit signs.

Article 3.4.5.1 states that an exit sign must be placed over or adjacent to every exit door in a building more than 2 storeys in building height, in a building with occupant load more than 150 persons, in a room or floor area that has a fire escape as part of a required means of egress. In addition every egress door from rooms with occupant load more than 60 persons in occupancies such as theatres, movie houses, restaurants, dancing halls, licensed beverage establishments, etc., must be provided with an exit sign - for easy identification of the egress doorway.

Building code experts should be also consulted by the electrical designers and installers in order to accurately identify required locations for installation of electrically connected exit signs. And when this is done, Rule 46-400 of the CEC will guide the designers and contractors towards installation requirements and wiring methods.

It is interesting to note that Appendix G of the CEC provides a comprehensive cross-reference from Rules of Sections 46 to the applicable Articles of the NBCC. And as it is usually done in cases where life safety equipment and systems mandated by the NBCC and the CEC are intended for installation , authorities with jurisdictional power for application and installation of emergency lighting and exit signs must be consulted when these installations take place.

Counterfeit & Unsafe Electrical Products

By Dave Shavaliar, Past President, EIA BC

Our February meeting was the venue for presentations by Brian Savaria of Eaton Electrical and Joseph Neu, Vice President of Engineering, Codes & Standards for Electro-Federation Canada (EFC). Their focus was on counterfeit and unsafe electrical products. This is not the first presentation we have had on this topic but it certainly drove home to us how widespread and evolving this problem has become. In fact, it is spreading like well tended fungus.

One of their main points hammered home to our audience was that if there was no certification label on the product it could be life threatening. Unsafe products are counterfeited and sometimes the label as well. However, the counterfeiter in his effort to cut costs sometimes cuts out the vital electronic components which assure the device’s ability to function safely. A prime example would be a counterfeited GFCI. Other frightening examples were given, such as counterfeited mini spiral 13 watt compact fluorescent lamps which exploded when they failed.



Ark Tsisserev introducing our guest speakers, Brian Savarin & Joseph Neu

Molded case circuit breakers are becoming a big concern. It is in some cases a two-prong problem. Counterfeit labels are being applied to breakers removed from

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hurricane damage in New Orleans. In many cases, they are tampered with. New labels confirm bogus electrical ratings. These are a fire waiting to happen. The other prong is the Chinese knock-offs totally counterfeit product with a well known manufacturer's brand on it. Raw material sources (old, used/salvaged circuit breakers) from Canadian and US refuse are being exploited and cleaned. Typically these are 480 volt rated and one of the problems is that the continuous current rating may be changed. A prime example of this was that a Montreal area grocery store had its panel boards filled with these breakers that were sold as new. They all had to be replaced. This problem is difficult to detect especially for the unaware buyer. Look for spelling errors on labels. Manufacturers of certified products don't make spelling mistakes. They spend too much on quality control.

Brian Savaria wanted all of our membership, if requesting assistance with suspected counterfeit Cutler Hammer products, to e-mail him personally at BrianASavaria@eaton.com.

Vigilance on the part of us all will help to get this major safety concern under control.

HUMOUR

A Bad Lie?

One fine day, Doug and Gerry are out golfing. Gerry slices his ball deep into a wooded ravine. He grabs his 8-iron and proceeds down the embankment into the ravine in search of his ball.

The bush is quite thick, but Gerry searches diligently and suddenly he spots something shiny. As he gets closer, he realizes that the shiny object is in fact an 8-iron in the hands of a skeleton lying near an old golf ball.

Gerry calls out to his golfing partner in an agitated voice, "Hey, Doug, come here. I got trouble down here."

Doug comes running over to the edge of the ravine and calls out, "What's the matter, Gerry?"

Gerry shouts back, "Throw me my 7-iron! You can't get out of here with an 8-iron."

Courtesy: ECABC, "The Conduit."

President's Message

Our association has had another exciting year. The website has become a useful tool for industry. The "Ask the Inspector" section is very popular with more and more requests for code interpretations coming in.

Also check out the "Inspectors' FAQs" for answers to a number of difficult electrical questions.

As always when dealing with code interpretations check with your local authority having jurisdiction for their interpretation.

Attendance at our meetings is steadily increasing and I want to thank those members for making the extra effort to come out and participate. We are endeavouring to provide timely and informative presentations at these meetings and hope to see all members attend when they have the opportunity. I think you will find it rewarding.

At the recent AGM our annual election of officers found most incumbents being returned for another term. Thanks fellows for your continuing dedication and efforts.



New EIA Director, Ken Cornwell, Electrical Safety Officer, Squamish office

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"President . . ." continued from page 4

Two new directors coming on board this year are Eric Sipila, Senior Electrical Inspector with the City of Burnaby and Ken Cornwell, Electrical Safety Officer with BC Safety Authority.

I also want to take this opportunity to recognize our departing directors, Bob Cornwell and Mauro Rubini, for their involvement and efforts over the past few years. Thanks, guys. You were there when we needed you. I hope to see you out at the meetings.

This year there is a new edition of the BC Electrical Code in the works with a target date for adoption in the fall. We are planning on putting on another of our popular code seminars detailing all of the changes from the present code. This seminar is also tentatively set for the fall. I will give you more details as things firm up. That's it for now. See you at the meetings.

Roger Tuttle, President



New EIA Director, Eric Sipila, Senior Electrical Safety Inspector, City of Burnaby

Renewal Time!

According to the EIA records as of March 23, 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.

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Has anything changed?

Name: _____

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Company or Employer: _____

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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**

What is the Canadian Electrical Code, Part I?

By Leslie Stoch

What is the Canadian Electrical Code, Part I? How and when does it apply and what are its purposes? Everyone knows that's where we go to find out what we have to do to pass an electrical inspection. But is that it? In this article, rather than focus on what the code says about grounding, bonding and motor protection, let's consider the bigger picture and look at the philosophy and intent behind the code.

A title page note says: "The Canadian Electrical Code, Part I is a voluntary code for adoption and enforcement by regulatory authorities." Regulatory authorities - you know who they are - the electrical inspection authorities in all of Canada's provinces and territories. On its own the code has no basis in law. It only becomes the law when adopted and legislated with or without amendments by the "regulatory authorities" in each province or territory. Some jurisdictions need to make extensive amendments, while others have very few.

And there is no requirement that all jurisdictions pass the CEC, Part I into law at the same time. As sometimes happens, one province might very promptly adopt a new version of the code, while its neighbours may hang in with an earlier version for many more months. So don't throw away that old code book too quickly, since you might still need it for a time.

Even though the CEC, Part I is intended for application only within Canada, it also "meets the fundamental safety principles of International Standard IEC 60364, Electrical Installation of Buildings." Compliance with an international standard reminds us that we now live in a world where standards are rapidly becoming global ones so as to meet the growing demands for barrier-free international trade. Are we moving toward a universal electrical code and standards and is this always a good thing?

The stated object of the CEC, Part I is to provide safety standards for installing and maintaining electrical equipment so as to minimize electrical shock and fire hazards. We are also reminded that electrical installations should have sufficient capacity, not only to meet today's demands, but to allow for future growth. This is good basic design, but is sometimes overlooked to save a few bucks.

We are further reminded that the code "is not intended as a design specification not an instruction for untrained persons." Here's something extremely impor-

tant that is sometimes overlooked. Regrettably, we sometimes become too obsessed with meeting the minimum requirements that will pass an electrical inspection. That's not good planning nor what is intended. The code is proposed only as a minimum safety standard. First-class design always demands more, and literal interpretation of the code is never intended as a reasonable substitute for suitable qualifications, training and experience.

What is covered and which installations are exempt from its requirements? The scope of the CEC, Part I covers all electrical equipment and work except for some types of installations that are expected to meet other standards. Please note that different authorities have modified the exemptions listed in the CEC, Part I to suit their individual local need.

The first exemption covers electric, communications and community antenna distribution systems utilities when carrying out their utility responsibilities. For example, the generation, transmission and distribution facilities of an electrical utility are not required to comply with the code. Neither must the operating facilities of telephone and cable television companies. Otherwise, all of their non-utility facilities in head office buildings, etc., do need to comply.

The motive power and equipment for electric railways, streetcars and subway systems are exempt from the CEC, Part I, but all other facilities in stations, yards and other buildings are required to comply with the code.

Railway signalling and communications systems in railway cars, buildings and along the tracks are not required to comply with the CEC, Part I.

Aircraft electrical systems are also exempt, but all airport facilities including electrical systems in terminal buildings, runway lighting, etc., are required to be in compliance.

Electrical systems in ships regulated by Transport Canada are not governed by the code. But when a ship is permanently tied up and reworked as a fancy restaurant, the electrical code does apply.

In general, mines and quarries are not exempt from the CEC, Part I, but are also covered under a different standard, CSA Standard CAN/CSA - M421. However, in the different regions of Canada, electrical safety in mines and quarries is managed in several ways, often as a

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shared responsibility between the electrical and mining inspectors.

In summary, a better understanding of the viewpoint and intent behind the code will always lead to a better understanding of its rules. As with past articles, you should always consult the electrical inspection authority in each province or territory as applicable for a more precise 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 January-February 2005

Next General Meeting
Monday, May 1, 2006

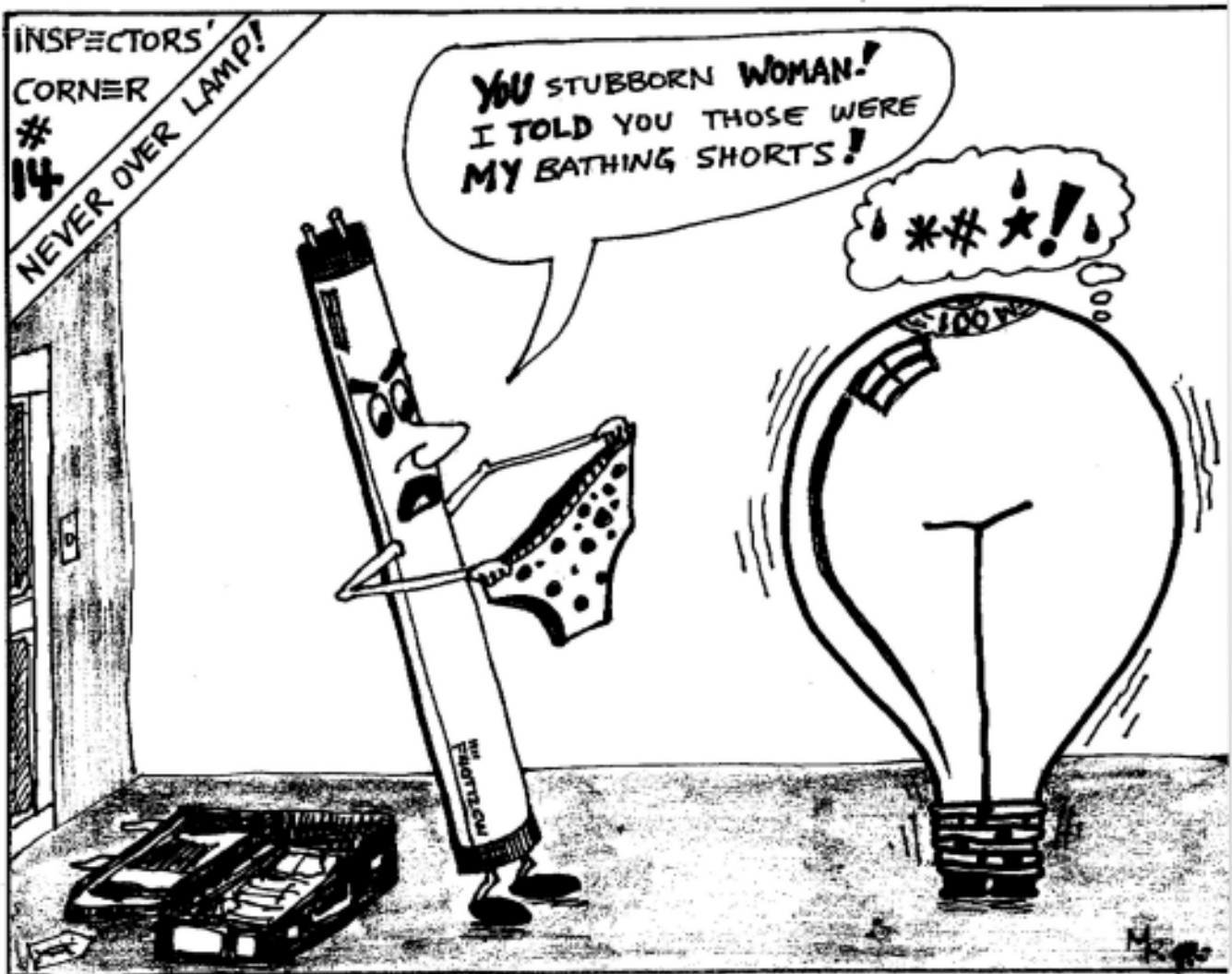
The Cheers Restaurant
125 East 2nd Street,
North Vancouver

Social Hour: 5:15 - 6:00 p.m.

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

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

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Cartoon by Mauro Rubini

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EIA GENERAL MEETING

Monday, May 1, 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

- Reg Gelati, Technical Sales Representative for Crouse-Hinds to provide an update on developments in hazardous areas—Divisions & Zones
- Review the concept behind Divisions & Zones with product examples.
- Secondary process seal –relating to 2006 new code changes - short video

New life-time members to be recognized

Please confirm your dinner reservation by calling: Dwayne Asking: Phone: (604) 660-0885; Fax (604) 660-0187 or Email Dwayne.Askin@safetyauthority.ca before Thursday, April 27, 2006

Please book a seat by contacting Dwayne Askin. Accurate numbers for the dinners result in a savings on dinner costs and ensure a seat for everyone.

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Please accept my application for membership in the EIA of BC

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

Don't forget to

renew your

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