# **Safety Program Tips**



Volume 41 • Number 2

# Ground Fault Protection

Unsafe Workplace Practices – Criminal Offences?

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Apprentices at Electrical & Utilities Safety Association learn safe practices. Photo courtesy of E&USA

# **President's Message**



In the past, I've discussed the way the Electrical Contractors Association of Ontario works – its reliance on committees to get things done, the responsibility of the Board of Directors for oversight of these initiatives, and their responsibili

ities for reporting local issues to the Association as well as Association issues back to the local areas. Supporting all of this is the Association's communication system.

Our committees work hard on behalf of the membership to create an Association that speaks out on your behalf on issues that are vital to your company's success, and provide services that add value to your membership. As hard as they work, though, it can all be for naught if you don't know what's being done.

On the other side of the coin, it's essen-

tial that information flow back from you. For all our discussion about committees and boards of directors, an association is really about its members. The better we know your needs and the more information we get from you, the better we can serve you.

ECAO strives to get you the information you need in a timely manner. In addition to the Directors' reports, the ECAO News and this magazine are the two most obvious ways that the Association keeps the membership informed of its activities. ECAO News is published ten times a year and contains information on the day-to-day operation of the Association, courses being offered, trade shows that we're participating in, etc. This magazine looks at broader industry issues and has the space to look at these in more depth.

Living in the information age, we are also able to take advantage of the Internet. Our website (www.ecao.org) is more than a place to look for information on the next conference (although it is excellent for that). It's the ideal place to look for information on the activities of the committees and upcoming courses. Back issues of our news publications are posted on the site, and there are order forms for our publications and manuals. The big advantage to a website is the ability to update it quickly and cost-effectively. It is constantly being analyzed and the content continues to evolve.

Communications is a high priority at ECAO. We hope you'll take full advantage of the benefits it provides. Enjoy the magazine, read the newsletters, visit the website, and don't hesitate to give us your feedback. And, while you're thinking about it, give the office your e-mail address. It will help us get you the information you need in a timely manner.

George Boals

# **Editor's Message**

The electrical industry has an enviable safety record. Evidence of this is seen in our lost time frequency rate. According to WSIB data, compared to all construction firms across Ontario, Rate Group 704 (with just slightly more than 2) consistently had at least one less injured worker per 100 full-time workers from 1998 to 2001.

Health and safety issues figure largely in the way we do our work. They also have a big impact on our profit and loss statements. And so, in this issue, we focus on health and safety.

May is Electrical Safety Awareness Month and this year's theme is "Where the Power Meets the People", focussing on safety around high voltage transmission lines. The Electrical and Utilities Safety Association, who train our power and utility workers, were kind enough to supply an article on safety measures to take when you have to work near these.

Rick Mei spends his days helping contractors institute and administer safety programs. If you're setting up a program for your company, or if you already have one in place, you know that there is a lot to think about. Mr. Mei gives us the benefit of his expertise by providing a checklist of some of the key issues for your consideration.

Ted Olechna, the Electrical Safety Authority's Provincial Code Engineer, examines code issues around ground fault protectors, discussing the differences between GFCIs and GFPs and the use of GFPs as defined by the code.

It's always a tragedy when safety systems break down and someone loses their life on a jobsite. In this unfortunate circumstance, should the officers of the company be charged with a criminal offence? Rob Boswell looks at proposed changes to the criminal code that could, under certain circumstances, have that result.

Gary Robertson is ECAO's HR Specialist and has devoted a great deal of time and energy working on Workplace Safety and Insurance Board issues. WSIB created the Second Injury and Enhancement Fund (SIEF) to provide employers with cost relief when a claim is the result of a preexisting condition. In most cases this provides a fair and equitable solution to the problem. The question is whether it works with CAD-7.

We also have an article from Bob Collins looking at the underground economy. You may wonder what that has to do with health and safety. The Ontario Construction Secretariat estimates that WSIB alone loses \$28 million per year in revenues to people getting paid under the table. It's a huge problem and, as an honest contractor, you're carrying the load. Mr. Collins tells us just how big that load is.

We hope you find this edition of the Ontario Electrical Contractor useful and informative. If you have any comments or suggestions, feel free to drop me an e-mail (egoodwin@ecao.org) or give me a call at 416-675-3226 ext. 313.

Earle Goodwin

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# **Ground Fault Protection**

#### By Ted Olechna, P.Eng

id you ever wonder why ground fault protection is mandated in the Ontario Electrical Safety Code? Arcing ground faults in solidly grounded electrical systems or components can cause severe damage to electrical equipment and premises. The overcurrent device will not sense the arcing ground

"There are two basic ground fault protection schemes available: Zero Sequence Sensing, and Ground Strap Sensing. In deciding which protection scheme to use in an installation, one has to consider a number of design considerations."

fault in many situations because the fault current might be small enough to go undetected due to the resistance of the arc. Ground-fault protection is designed to provide protection from line-to-ground faults that occur on the load side of the main disconnecting means.

### What is it?

The Ontario Electrical Safety Code (OESC) defines a GFCI to mean "a device whose function is to interrupt, within a predetermined time, the electrical circuit to the load when a current to ground exceeds some predetermined value that is less than that required to operate the overcurrent protective device of the supply circuit "

Ground Fault Protection (GFP) on the other hand is not defined, but do not confuse ground fault protection with the everpopular GFCI of the class A type. "Ground-Fault Protection" is intended to provide protection of equipment from damaging lineto-ground fault currents by operating to cause a disconnecting means to open all ungrounded conductors of the faulted circuit. This protection is provided at current levels less than those required to protect conductors from damage through the operation of a supply circuit overcurrent device. The fundamental difference between the two is that the GFCI is a single device whose function is protection against electric shock, and the GFP is a system intended to provide protection for equipment.

### When are they required?

Rule 14-102 requires ground fault protection be provided to de-energize all normally ungrounded conductors of a circuit that faults to ground, where one of the following circuit characteristics exists in solidly grounded systems:

- a. 2000 Amp or more and rated 150 volts or less to ground; and
- b. 1000 Amp or more and more than 150 volts-to-ground, but less than 750 volts phase-to-phase.

Diagram 3 of the OESC (Figure 1) shows a variety of ultimate points of conductor de-energization in the event of a ground fault.

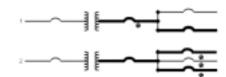


Figure 1. Points of Conductor De-energization

Rule 14-102(6) states that sensors shall be permitted to be installed at any point between the supply transformer and the downstream side of the disconnecting means marked with an asterisk in Diagram 3, but if located downstream from this disconnecting means the sensors shall be placed as close as practicable to its load terminals. The "\*"s (asterisks) indicate the ultimate point beyond which the downstream ungrounded circuit conductors must be de-energized in the event of a ground fault in the circuit fed by such conductors.

There are two basic ground fault protection schemes available: Zero Sequence Sensing, and Ground Strap Sensing. In deciding which protection scheme to use in an installation, one has to consider a number of design considerations.

### Zero Sequence Sensing

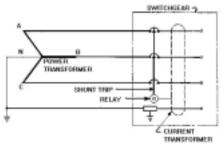


Figure 2. Zero Sequence Sensing

In a Zero Sequence Sensing scheme the following has to be followed:

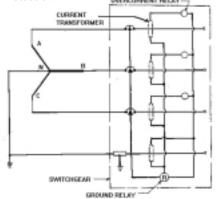
- There must be a single current transformer encircling all of the phase conductors of the circuit including neutral.
- All grounding of the neutral must be on the line side of the sensor. This is particularly important where the neutral is grounded both at the switchgear and at the transformer.
- The zero-sequence current transformer may be located on either the load or the line side of the circuit breaker contacts.
- The current transformer encircles all phase conductors and neutral. The sensor does not encircle the equipment-grounding bus. The grounding of the system and the neutral connection to the enclosure at the service are to be on the supply side (ahead) of the sensors

Rule 14-102(5)(a) states the vector sum of the currents flowing through the sensor equals zero under normal conditions. When a circuit conductor faults to ground, the current returns via the grounded metal enclosure, conduit or other path outside the sensor. This results in a non-zero current sum through the sensor which, in turn, generates an output signal to the relay, and the circuit is opened within milliseconds of the fault.

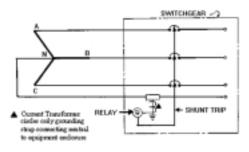
A variation of the zero sequence sensing scheme is as identified in Figure 3. The residually connected ground fault

protection system is a form of zerosequence sensing. The difference being this system utilizes a number of current transformers, instead of one. The vectorial sum of the phase currents and the neutral current are monitored using separate current transformers and a ground relay. Again, note similarity to zero sequence. The grounding points must be on the supply side (ahead) of the sensors (current transformers).

### Figure 3. Residually Connected Ground Fault Protection



**Ground Strap Sensing** 



### Figure 4. Ground Strap Sensing

In a Ground Strap sensing scheme the following has to be considered:

- A standard ratio type current transformer senses current flow on the bonding strap that connects the frame or grounding bus of the switchboard to the neutral.
- The transformer neutral may be grounded at the transformer only if the ground strap sensor is located at the transformer as well. In this case the neutral must remain ungrounded at the switchboard.
- Ground strap sensing is applicable where the system neutral is grounded in the switchgear and isolated from ground at the transformer

Rule 14-102(5)(b) requires sensors that sense ground fault current flowing from the fault to the supply end of the system through the ground return path. An exception is permitted in Rule 14-102(7) where the neutral is grounded both at the supply transformer and at the switching centre, the sensor at the transformer shall not be required provided the maximum pickup setting of the ground fault relay does not exceed 1000A.A ground fault on any branch circuit, feeder or sub-feeder, anywhere in the system, will cause the current to flow back to the neutral through the bonding strap which, in turn, generates an output signal to the relay and the circuit is opened.

When designing the ground-fault protection scheme, the circuit impedance and available short-circuit currents should also be determined at the supply terminals, so that equipment and overcurrent protection of the proper interrupting rating are used, as required by Rule 14-012.

# What other installations require ground fault protection?

Rule 62-300(4) for electric surface heating and 62-400(5) for heating cable sets installed in pipes and ducts, require that ground fault protection shall be provided to de-energize all normally ungrounded conductors of electric heating cable sets and heating panel sets, with a ground fault setting sufficient to allow normal operation of the heater. Rule 18-120(2) requires ground fault protection to be provided to de-energize all normally ungrounded conductors of an electric heat tracing cable set with the ground fault trip setting adjusted to allow normal operation of the heater in a Class I, Zone 1 area.

The inherent design of heating cable sets

and panel sets may allow arcing to go undetected by not causing the overcurrent device to trip, resulting in a fire hazard. The requirement for a metal braid or sheath, bonded to ground and with ground fault protection, provides a safeguard against this potential hazard

In conclusion, this ground fault protection should not be confused with a ground fault circuit interrupter of the Class A type which has mandatory limits of between 4 and 6 milliamperes. The primary purpose of these protections are intended to provide protection for equipment rather than against electric shock, and therefore the trip setting may be significantly higher than the Class A GFCI.

Ted Olechna, P.Eng is the Provincial Code Engineer with the Electrical Safety Authority. Further information about the Electrical Safety Authority and how you can acquire Bulletins and the Ontario Electrical Safety Code, also available electronically, can be found at www.esa-safe.com.



# **Corporate Criminal Liability for Unsafe Workplace Practices**

## The Federal Government's Proposed Changes to the Criminal Code

In 1992, twenty-six miners were killed at the Westray mine in Nova Scotia. The province appointed Justice Peter K. Richard to conduct an inquiry. From the inquiry, Justice Richard concluded that failures in safety in the corporation's mining practices led to these deaths.

Though Justice Richard did not make any recommendations to amend or change the criminal law with respect to the criminal liability of corporations, their directors and officers, frustration grew out of the apparent inability of the law to address what was perceived to be flagrant disregard for safety in the workplace.

### Bill C-284

Following the inquiry, in February 2001 Bill C-284, *An Act to amend the Criminal Code (offences by corporations, directors and officers)*, a Private Member's Bill was introduced into the House of Commons. The Bill was sent by the Government for review by the Standing Committee on Justice and Human Rights. The Standing Committee has recommended changes to the criminal law and the Government has responded by proposing to introduce legislation into the House of Commons which will effect this reform. This proposed legislation has not yet been introduced.

Bill C-284 proposes to extend criminal liability to a corporation in some circumstances where a member of the corporation's staff commits a criminal offence. Criminal liability would flow to the corporation where management of the corporation authorized, tolerated, con-

doned, or encouraged an act or omission which is an offence. Similarly, liability would flow where management allowed the development of a corporate culture that encouraged employees to believe that the offence would be tolerated, condoned or ignored by the corporation. Further, if the corporation failed to take steps to put in place measures to communicate to employees that such acts are unlawful and forbidden by the corporation or failed to put in place practices that would ensure that such acts would come to the attention of management. criminal liability for the offence would flow to the corporation.

Proposed corporate fines extend as high as \$10 million for offences such as murder or manslaughter.

Criminal liability for directors and officers is also proposed in the legislation, where any director or officer knew or ought to have known that the offence was being committed, would be or was likely to be committed, and who also failed to take all reasonable steps to prevent the offence from being committed. The Bill proposes the same penalty for director or officer for the offence as though that person committed the offence himself or herself.

### Criminal Liability for Unsafe Working Conditions

Bill C-284 also specifically addresses offences relating to "unsafe working conditions". It is important to note that the term "unsafe working conditions" has not been defined in the Bill. As a result, the amendments proposed in this Bill leave a wide scope for interpretation.

If a corporation permits "unsafe working conditions" to exist or fails to take all reasonable steps to provide safe working conditions for its employees, it would be guilty of an indictable offence with possible liability on fine of up to \$100,000. Every director or officer of corporation found guilty of the above noted offence, is also guilty of an offence is he or she knew or ought to have known of the unsafe working conditions. Fines proposed are \$10,000 for each day that the director or officer permitted the unsafe working conditions to persist without the director or officer taking all reasonable steps to eliminate the conditions. It also proposes prison terms of up to seven years for conditions that do not result in death, and up to life for conditions resulting in death.

### **Response of the Federal Government**

In its response to the Standing Committee report, the Federal Government noted in November 2002 that the proposed changes are not intended to replace or interfere with the existing health and safety legislation found in the Canada Labour Code (for federally regulated employers) and in provincial occupational health and safety legislation, but rather as an important additional level of deterrence if effectively targeted at – and enforced against – companies and individuals that show a reckless disregard for the safety of workers and the public.

Concerns raised during Standing Committee meetings include the vagueness of some of the proposed scope of Bill C-284. Included in this is concern over liability for a "corporate culture". The Government responded by noting that it would be necessary to determine whether the directors and officers of corporation tolerated "lax procedures". Having noted that, the Government acknowledged that "corporate culture" remained too vague a concept.

The Government has also indicated that it accepts that the criminal law should not place an unfairly high standard of care on directors and officers, but at the same time should not allow them to turn a blind eye to potentially criminal activity.

As a result, it proposes that directors and officers should be held liable for "the way that they carry out their responsibilities" and not simply because they are directors or officers.

### **Proposals of the Federal Government**

As a result of completing its Standing Committee meetings, the Federal Government has made several proposals for reforming the Criminal Code. Amendments to Bill C-284 have not yet been made. The Government's proposals are as follows:

- 1. The class of persons capable of engaging the liability of the corporation should be expanded to include individuals who exercise delegated, operational authority.
- 2. Where crime is one of negligence, corporate criminal liability should be based on the actions and moral fault of the corporation as a whole.
- 3. Where the crime is one where subjec-

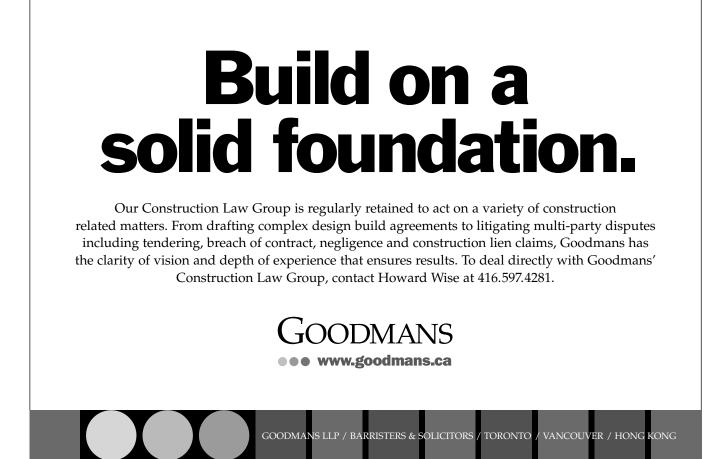
tive intent is required, it should be proven that a "directing mind" or person exercising operational control formed the intent of committing the crime and, with at least some intent, that the commission of the crime would benefit the corporation. In such a case, both the individual and the corporation should be criminally responsible.

- 4. The same approach should apply where a person with operational authority fails to take remedial action when aware that an employee or employees are committing a criminal offence on behalf of or for the benefit of the corporation.
- 5. Everyone who employs others to perform work or has a power to direct how work should be done should be under a duty to take reasonable steps to ensure safety of workers and the public.

This last proposal suggests that responsibility, including criminal responsibility, may lie with every supervisor, manager, director and officer, to ensure the safety of workers and the public when they have some authority for the way in which work is performed.

Whether or not legislation is introduced or passed into law, contractors should continue to place workplace safety as their highest priority. Aside from the obvious importance behind ensuring that workers and members of the public are safe, liability already exists for unsafe working conditions in Ontario, including significant liability under the Ontario Occupational Health and Safety Act and under the Ontario Workplace Safety and Insurance Act.

Rob Boswell is with the law firm Hicks Morley Hamilton Stewart Storie LLP. The focus of his practice is workplace safety and insurance and occupational health and safety. He is also the co-author (with Jason Mandlowitz) of the "Contractor's Guide to Workplace Safety and Insurance", ECAO's companion manual to its WSIB Seminars.

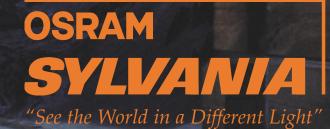




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# **WSIB's SIEF and CAD-7**

## A Question of Fairness

By Gary Robertson

The bidding was tight, very tight, but you were successful in securing the contract due, in part, to your exemplary safety record. You assembled your project team and prepared to start the job. The call went out to the union ball for 10 electricians and the job commenced.

All went well, the job was completed after 4 weeks, under budget, ahead of schedule and with no incidents or accidents. The client was extremely pleased and so impressed with your safety performance, that they said they would like you to quote more work to them directly.

All is right with the world. Or so you thought



Two months after completion of the job, you receive a letter from the WSIB advising you that one of the electricians who you hired for the project, and subsequently laid-off, is claiming a work-related accident. You immediately contact your WSIB

"Essentially, SIEF is an internal WSIB mechanism used to transfer all or part of the costs of a claim away from one particular employer, into the general account of the rate group."

account rep. to inquire about the claim, especially since there were no reported incidents on the job (you are extremely vigilant on the reporting of incident/acci-

dents). You are informed that the worker sought medical treatment for a problem with his right wrist, 2 weeks after completion of the job, has been diagnosed with Carpel Tunnel Syndrome (CTS) and will require surgery.

The WSIB then informs you that medical reports indicate the worker has been suffering from this problem for several years and it is due to long-term wear and tear on the wrist from 10 years working as an electrician. The worker will incur a loss of earnings while he recovers from the surgery. Since you were the last employer of record, your company is responsible for the claim.

However, the WSIB then informs you that, due to the fact that the worker suffered from a major pre-existing condition and there was no significant initiating factor while in your employ, you will be receiving 90% cost relief. In other words, you will only have to take responsibility for 10% of all costs related to this claim; the remainder will be transferred to the WSIB's Second Injury Enhancement Fund (SIEF).

You breathe a sigh of relief. After all, that sounds fair. And you inform the WSIB representative that you really didn't relish the thought of having to inform your customer that you incurred a Lost-Time Injury while at their work-site. Unfortunately, at this point the WSIB rep. informs you that your company WILL have an LTI recorded against it, even though 90% SIEF is applied. This, you realize, will negatively impact your frequency index resulting in a reduction of Experience Rating rebate (penalty) of approx. \$20K. You drop the phone and ask yourself, "Is this fair?"

The scenario above is fictitious, but the circumstances can, and do, occur.

# What is The Second Injury & Enhancement Fund (SIEF)?

WSIB Operational Policy #08-01-05 states:

"If a prior disability caused or contributed to the compensable accident, or if the period resulting from an accident becomes prolonged or enhanced due to a pre-existing condition, all or part of the compensation and health care costs may be transferred from the accident employer to the SIEE."

"The objectives of this policy are to provide employers with financial relief when a pre-existing condition enhances or prolongs a work-related disability. It thereby encourages employers to hire workers with disabilities."

Essentially, SIEF is an internal WSIB mechanism used to transfer all or part of the costs of a claim away from one particular employer, into the general account of the rate group. The guiding principle behind



# This <u>isn't</u> the time to be thinking about "loss prevention".





the SIEF is that the individual employer ought not to be charged with the costs of a claim when accident or injury is caused or prolonged by a medical condition unrelated to the work.

The purpose of SIEF is to encourage employers to employ disabled workers who might otherwise have difficulty securing employment by reducing the employer's financial risk. This limitation on costs is designed to remove the financial disincentive to hiring workers who may be perceived to be at higher risk of having accidents or aggravating pre-existing conditions. This injects an element of "fairness" into the allocation of claims costs.

Employers take their workers as they come. The Ontario Human Rights Code limits or prohibits the employer's ability to enquire into a worker's medical history. They are not able to monitor or prevent possible recurrences to pre-existing conditions, since workers do not have to declare prior conditions. As a result, employers do not feel that they should be subjected to the full cost of such a claim. SIEF attempts to remedy this type of situation.

Experience Rating (ER) rewards employers who reduce their accident costs through rebates, and penalizes those with excessive accident costs through surcharges. The clear intent of the ER program is to focus assessment costs on those employers who have the worst accident experience.

Employers, therefore, view SIEF as an equity measure because they only accept the consequences and costs of a compensable accident if those consequences and costs are directly attributable to the work being performed while the worker is in their employ.

For employers whose ER programs are based solely on costs, a 90% reduction in claims costs is significant and meets the intended outcome of fair and equitable allocation of those costs. It does not unduly penalize them for hiring a worker with a pre-existing condition or disability.

> Construction employhowever, ers are unique in that they are rated under CAD-7, which is the only ER program that gives equal weight to both costs and Lost-Time Injury (LTI) frequency. Claims costs of more than \$1 outside of health care trigger a Lost-Time Injury frequency count. Under SIEF, even though they are relieved of a substantial portion of claims costs, they still

incur an LTI, which can, and often does, result in a significant penalty.

The nature of construction work exposes workers to conditions that could result in the development of "repetitive strain" type injuries. Because this type of injury develops over a span of time that is greater than is usually spent with one employer, it is vital that construction employers receive assurance that, if these pre-existing conditions lead to a claim, the SIEF Policy will allocate the costs fairly. Applying an LTI frequency to an individual employer's record on claims that receive significant cost relief under SIEF creates an environment that could seriously impede the free movement of labour in the construction industry.

This puts workers, who are entitled to benefits as a result of working many years in the industry, at risk. For, while the employer community generally accepts that workers should be entitled to benefits for injuries/diseases resulting from work, they feel that there must be a fair and equitable allocation of the costs for these type of claims to the industry as a whole. When an individual employer is penalized for hiring a worker with a pre-existing condition or disability, the only way the employer can avoid that penalty is to argue that the worker is not entitled to benefits. Also, employers may become extremely wary of hiring any employee who might have such pre-existing conditions.

ECAO is currently seeking a course of action that restores the element of fairness in the application of SIEF by the WSIB. If you have experienced hardship or difficulty resulting from a similar situation, please contact me.

Gary Robertson is the HR Specialist at ECAO.

# **Write to: Earle Goodwin, Managing Editor**

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# **Moving Safety Forward**

#### By Rick Mei

In developing and maintaining an active safety program, the ability to cover every contingency remains a constant challenge.

The Workers Health and Safety Act is very clear that you are to "take every precaution reasonable in the circumstances for the protection of a worker".

Many feel that this is a statement of impossibility. It would entail being able to conceive of every possible cause of an accident and put measures in place to prevent them. And merely complying with the letter of the law will not be a valid defence if an accident occurs. Does this give you license to ignore the problems and hope for the best? No.

As owners, directors or managers, there are prudent steps you can take to move safety forward.

As a starting point, spend some time reviewing your company's safety program. The following can be used as a guide as you begin your review process. You may wish to begin by asking:

# How is our record, to date with respect to:

- deaths, lost time, medical aid, first aid, near misses?
- WSIB ratings and costs?
- Rebate position (negative/positive)?
- Ministry orders?
- Is our program:
- current (to legislative requirements)?
- communicated and understood?
- adequately and *consistently* providing documentation?

Even if you are satisfied with the results of the above short review, remember, where health and safety is concerned, improved efforts pay.Add to the list above, take action and move safety forward.

Here are some other areas that you may wish to address or consider.

The Occupational Health and Safety Act requires that you review your Health and Safety Policy Statement and Program annually and that your Statement is currently dated, signed and posted in the workplace. Have you laid out a safety plan, including your objectives, a time frame to meet the objectives, and assigned responsibility to an individual(s) by name, not title? Is there a process in place to measure your progress? If you have a Safety Committee or Worker Representative(s), have they been involved? Remember that one of your key objectives should be to identify hazards, remove hazards, to eliminate their causes and to communicate every step of this process within your company.

You should provide a full company indoctrination to all new employees. This process should cover all office/shop employees, as well. If you have long term employees, it may be a good idea to provide a full indoctrination for them on a regular basis. How valid is an indoctrination done five or ten years ago? If you hire subcontractors, they should also be indoctrinated (site specific, at least). And remember to keep records of all indoctrinations. When employees are moved from site to site, a site specific indoctrination is required and, once again, a record kept.

If you hire a company or individual to perform work at your office (cleaning, lawn, windows), who may work alone or at night, you should provide safety instruction. Do they have liability insurance or WSIB coverage?

Are emergency plans in place at your site location(s)? How about your office, shop and storage areas? Are they visibly posted?

Do you meet all the required legislated training requirements within all areas of your company (e.g., first aid, CPR, fall protection, man lifts, propane, fork lifts, explosive actuated tools, WHIMIS, WHIMIS review)? Has current training in the Occupational Health and Safety Act and applicable regulations been taken by management and supervisors? Who, within your company, is trained in workplace inspections, accident/incident investigation, safety committee/worker representative? Do you, your supervisors and managers meet the definition of "competent" under the Act?

Do you have employees trained in confined space, tagging and lockout, fire protection, emergency procedures, material handling, hot or live work, signs and barricades, personal protection or suspended access equipment? Do you review employees' responsibilities, and do you also review their four basic rights (right to know, right to participate, right to refuse work and right to stop work under certain circumstances) under the Act?

Before work starts on a project, is a project safety analysis conducted?

Do you conduct job task analysis during a project or where risk factors are high?

Do you perform valid workplace inspections, planned or unplanned, by management, supervisors, committee or safety representative(s)? How about your office, shop and storage areas?

Do you conduct accident/incident investigations for lost time and medical aid? How about non-disability first aid, property damage, fire, explosions, chemical spills/releases, chronic/acute occupational illness or near misses? Do you compile an annual accident analysis for review?

Do you have a claims management program that includes monitoring injured workers' progress, alternative work opportunities and assigned responsibility (by name) for program management?

At this point, you may have recognized areas where your current health and safety program could be improved.

Here are some other areas for your consideration:

Environmental policy

Drug and alcohol policy

Discipline policy

Tools and equipment training

Fleet safety training

Once again, can you add to this list? Safety programs, just like production processes, can usually be made better. By constantly reviewing situations, questioning existing practices and taking action you can move safety forward.

Rick Mei is a representative of Quality Connection, the Joint Electrical Promotion Plan's occupational health and safety program.

# Underground Economy Continues to be a Problem

### By Bob Collins

### Annual Losses of \$1.3 Billion

The underground economy maintains a strong presence in Ontario's construction industry. Research by the Ontario Construction Secretariat (OCS), conducted by Prism Economics, shows that the underground accounts for an estimated \$1.3 billion in lost revenues to government and government agencies and around 25 percent of the industry's total employment. Its' presence has serious impacts on the construction industry and creates even more devastating concerns for selected regions and trades which are more vulnerable to underground practices.

### **Recent Trends**

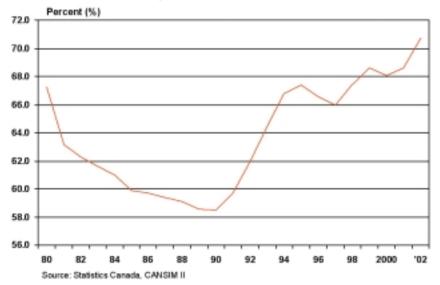
Measuring the size of the underground economy in construction is a complex process. Statistics Canada and other research groups have developed several broad based measures, most of which are difficult to update. However, there are two important indicators that can be updated and neither suggests any significant decline in underground activity.

The first indicator is the increase in the number of reported self-employed construction workers over the past decade. Self-employment in itself is a legitimate practice; however, research has shown a strong correlation between self-employment and income concealment and tax evasion. Self-employment is seen as a first step for individuals to participate in underground activities. Therefore, any significant increase in the rate of selfemployment can act as a gauge for the likelihood of increased underground activity.

Exhibit 1 shows that the number of selfemployed to total employment for construction occupations has been on a general increase since the early 1990s. Based on Statistics Canada labour force statistics, carpenters share of self-employed increased from an average of 25% of total employment in the late 1980's to 48% in 2001. Painters increased from an average 38% in the 1980s to 53% in 2001.



Exhibit 2 Ratio of Currency Outside Charter Banks to Personal Expenditure on Goods and Services



In the late 1980's self-employment averaged around 24 percent of total employment compared to 34 percent in the late 1990s. For trades such as carpenters and painters, which commonly report higher frequency of self-employment, the rates are much higher. Key forces driving these increases were the introduction of the Goods and Services Tax (GST) in 1991 and a prolonged recession through the mid-1990s.

While Exhibit 1 shows a marginal decline in the rate of self-employment in 2000 and 2001, the actual number of self-employed workers continued to increase. The number of hourly-paid workers, however, increased at a greater rate than selfemployed, causing the self-employed share of total employment to decrease. Consequently, there is no reason to suspect any significant decline in the level of underground activity.

The use of cash is a second key measure. Payment for services in the underground requires the elimination of audit trails leading to the preference for the use of cash. Therefore, an increase in cash purchases is widely associated with increases in the underground economy.

Exhibit 2 shows that the ratio of currency outside banks in relation to total expenditures by households on goods and services continues to increase. Prior to 1991 there was a downward trend in the use of cash. However, post 1991 (with the introduction of GST), there has been a steady rise in the use of cash.

The combined effect of increased selfemployment and the use of cash has led researchers to trace the growth of the underground economy over the past decade. In it's 1998 report, the OCS concluded that underground economy practices have become embedded in the construction industry and there is little evidence of any significant decline.

### **\$2.4 Billion in Unreported Income**

The OCS has undertaken several studies that estimate the size of government revenue losses associated with activity in the underground economy. The 1998 study (updated in 2001), estimated that the underground economy accounted for roughly 25 percent of total construction employment. The highest incidence of employment was in the residential renovation market where 67 percent of total employment in that sector was associated with underground activity. An average of 34 percent of all residential employment was linked to the underground where as 11 percent of non-residential construction employment was work being done through underground practices.

Recent measures of underground employment translate to \$2.4 billion of unreported income annually or 19 percent of the total industry income. The share of income is lower than the employment share because underground workers typically work at a discounted labour rate. Unreported income has major ramifications for both government revenues and maintaining a level playing field for all workers and contractors in construction.



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### **Lost Government Revenues**

It is estimated that federal/provincial government and government agencies lose approximately \$1.3 billion dollars per year as a result of underground economy. Most of the loss, \$808 million (or 64 percent) is the loss of income tax resulting from unreported income. Losses related to GST and provincial sales tax to out-of-province contractors average around \$187 million while CPP losses are \$178 million annually. The Workers' Safety and Insurance Board (WSIB) loses an average of \$28 million per year.

### **Impacts Spread Beyond Financial**

The affects of the underground economy can be felt across all construction sectors, governments and society as a whole. Losses to industry go beyond pure financial, major impacts include:

- lost revenues to governments and government agencies;
- higher tax burdens on legitimate contractors and workers;
- weakened health and safety practices;
- lower labour standards and erosions of construction standards;
- weakened apprenticeship training and skills development program; and
- unfair competition for legitimate contractors and workers.

In addition to offering lower wages, contractors working through the underground economy can typically save between 15 - 20 percent by not paying statutory contributions and payments such as CPP, EHT, and WSIB. This is a growing concern for legitimate contractors that must be addressed.

The Ontario Construction Secretariat continues its work on the underground economy. On-going research is exploring ways that industry can work with government agencies to curb underground activity and work toward a level playing field for all contractors. What was once believed to be a residential renovation problem has now spread to all sectors and threatens the activities of many legitimate contractors.

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

### Employment Associated with Underground Economy Activity Ontario ('000)

	Avg. Employment	Underground Employment		
	1998-2000	Best Estimate	Rate	
New Residential				
New Housing	106.9	16.0	15%	
Renovations	59.1	33.1	56%	
Total New Residential	166.0	49.1	30%	
Repair Residential	187.5	14.4	67%	
Total Residential Construction	187.5	63.5	34%	
New Non-Residential				
Buildings	51.3	7.7	15%	
Engineering	40.9	1.6	4%	
Total Non-Residential New Const.	92.1	9.3	10%	
Repair Non Residential	25.3	3.5	14%	
Total Non-Residential Const.	117.5	12.9	11%	
Total Construction	304.9	76.4	25%	

Source: Ontario Construction Secretariat, Estimates of Revenue Losses as a result of Underground Practices in Ontario Construction Industry (2001).

#### Income Generated by Underground Economy Activity Ontario (Millions Current \$)

Avg. Income	Underground Income	
1998-2000	Best Estimate	Rate
\$4,062	\$518	13%
\$2,010	\$957	48%
\$6,072	\$1,475	24%
\$730	\$416	57%
\$6,801	\$1,890	28%
\$2,411	\$307	13%
\$2002	\$68	3%
\$4,413	\$34	9%
\$1,088	\$129	12%
\$5,501	\$505	9%
\$12,302	\$2,395	19%
	1998-2000 \$4,062 \$2,010 \$6,072 \$730 \$6,801 \$2,411 \$2002 \$4,413 \$1,088 \$5,501	1998-2000 Best Estimate   \$4,062 \$518   \$2,010 \$957   \$6,072 \$1,475   \$730 \$416   \$6,801 \$1,890   \$2,411 \$307   \$2002 \$68   \$4,413 \$34   \$1,088 \$129   \$5,501 \$505

Source: Ontario Construction Secretariat, Estimates of Revenue Losses as a result of Underground Practices in Ontario Construction Industry (2001).

#### Income Generated by Underground Economy Activity Ontario (Millions Current \$)

		Total Industry
		Avg. Annual Loss
Provincial Sales Tax Loss to Out-of-Prov	ince Contractors	\$11
GST Loss on New Housing		\$47
GST Loss on Residential Repair		\$129
GST Loss on Residential Renovation		\$187
GST Loss		
Income Tax Loss		\$808
CPP Loss		\$178
El Loss		\$44
EHT Loss		\$5
WSIB Loss		\$28
	Total Revenue Losses	\$1,259
Sources Optania Construction Secretariat Estimat	too of Dovonius Langes on a requilt	of Underground Drastings in Ontaria

Source: Ontario Construction Secretariat, Estimates of Revenue Losses as a result of Underground Practices in Ontario Construction Industry (2001).

## Ontario Construction Secretariat, The Underground Economy in Ontario' Construction Industry (1998) and Estimates of Revenue Losses as a result of Underground Practices in Ontario Construction Industry (2001).

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# **Upcoming Events**

# **Ideal Supply Trade Show 2003**

### Solutions for Success

Ideal Supply will be hosting its Corporate Trade Show this year on Wednesday April 30th and Thursday May 1st from 3:00 to 9:00 p.m. both days. The show is held at the Orangeville Agricultural Fair Grounds with over 30,000 square feet of floor space to showcase over 160 vendors and is open to all wholesale customers in Ideal Supply's automotive, electrical and industrial markets.

Ideal held their first show in Hanover in 1986 and every year since the attendance by suppliers and customers has grown. The show now attracts over 1,900 customers during the two days.

Ideal Supply is a privately owned wholesale distributor, founded in Listowel, Ontario in 1926. The Electrical, Industrial and Auto Parts Divisions serve Central and Southwestern Ontario through 22 branch locations. Ideal provides products and services for plant floor automation, the data communications market, as well as the efficient transmission, distribution and control of electricity.

# Westburne Ruddy Showcase 2003

Westburne Ruddy Electric will be hosting its annual Tradeshow and Conference on June 12, 2003 at the Civic Auditorium in Oshawa. The show will feature product demonstrations, seminars and displays from all facets of the electrical industry; automation, distribution, lighting, data communications, wire and cable, and utility. Over 70 manufacturers will be represented, including Rockwell Automation and their associated Encompass Partners, Cutler-Hammer Distribution, GE Lighting, Bussmann Fuses, Fluke Testing Equipment, Lithonia Lighting, Thomas and Betts, Hubbell, Leviton, Hoffman, and Woodhead.

Manufacturers' representatives will be on hand to display the latest products and discuss applications. As in past shows, Westburne Ruddy Electric will be offering several seminars throughout the day on topics ranging from industrial automation, power quality, and lighting control to residential communication systems. Each seminar is an hour in length and is intended to provide a condensed update on the latest technology innovations, trends, concepts and maintenance techniques.

Food and refreshments will be available, and door prizes will be drawn throughout the day.Various vendors will also be hosting hourly contests.

The show runs from 11:00 a.m. to 9:00 p.m. and is by invitation only. Please contact Sarab Voll at 905-576-7100 ext. 3237 for more information or e-mail at volls@westburneruddy.com. *Further information about the "Solutions for Success" trade show or Ideal Supply is available at www.idealsupply.com or call 519-291-1060 and ask for extension #261.* 

### Hannover Fair April 7-12, 2003 Hannover, Germany Tel: (800) 727-4183

EFC Annual General Meeting and Executive Evening April 9, 2003 Mississauga Convention Centre Tel: (905) 602-8877 ext. 238 Web Site: www.electrofed.com

Electrical Showcase 2003 "Energizing The Future" *April 15-16, 2003* Winnipeg Convention Centre The Manitoba Electrical League *Tel: (204) 783-4125 Web Site: www.meleague.net* 

"Solutions for Success" Ideal Supply Trade Show April 30 - May 1st, 2003 Orangeville Agricultural Fair Grounds Orangeville, Ontario Tel: (519) 291-1060 ext. 261 www.idealsupply.com

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

### Metering Billing CRM/CIS Americas Conference and Exhibition

May 4-8 2003 Chicago Illinois USA www.metering.com/events

### Electrical Showcase 2003 – Nanaimo May 8, 2003 Nanaimo, BC

Tel: (604) 291-7708 Web Site: www.bcea.bc.ca

Westburne Ruddy Electric Tradeshow and Conference June 12, 2003 The Civic Auditorium Oshawa, Ontario Tel: (905) 576-7100 ext. 3237 e-mail: volls@westburneruddy.com

### The Electrical Supply & Distribution Annual Conference

Setting Channel Strategy -Where the river meets the sea *June 4-7, 2003* Fairmont Le Manoir Richelieu Charlevoix Region, Quebec *Web Site: www.electrofed.com* 

Canadian Electrical Contractors Annual Conference June 18-22, 2003 The Fairmont St John's, Newfoundland

IEEE Power Engineering Society July 13-17, 2003 Toronto, Ontario

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



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