

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

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| <p><b>CCOH Executive &amp; Members 2007</b></p> <p><i>Each geographic area / local provincial organization is represented by a director at the CCOH.</i></p> <p>Directors/Assistant Directors:</p> <p>Leslie McCormick<br/>(British Columbia)</p> <p>Terry Demianenko /<br/>Kurt Dieckmann (Yukon)</p> <p>Dale Hills<br/>(Northwest Territories /<br/>Nunavut)</p> <p>Sheldon Weatherby /<br/>Shivi Thusoo (Alberta)</p> <p>Herb Wooley<br/>(Saskatchewan)</p> <p>Jane Maslowski /<br/>Edward Gatey<br/>(Manitoba)</p> <p>Lorraine Shaw - President /<br/>Richard Quenneville<br/>(Ontario)</p> <p>Alain Houle /<br/>Marie-Eve LePage (Quebec)</p> <p>Clive MacGregor - Treasurer<br/>(Atlantic)</p> <p><u>Website Committee:</u><br/>Chuck Pilger<br/>Sheldon Weatherby</p> <p><u>Newsletter Committee</u><br/>Yang Ting Shek (editor)<br/>Michal Zitnik</p> | <p><b>Letter from the Editor....</b><br/>Yang Ting Shek, ROH, CIH<br/>Editor – CCOH Newsletter</p> <p>Welcome to another edition of the CCOH newsletter. Over the past couple months, CCOH members have been busy preparing for the October 10 webinar in our series. Within this issue, you will find a recap of this webinar (CSA Z1000, Health and Safety Management System Summary). This second webinar in the CCOH/CCOHS series attracted 14 hub locations and represents a significant success to the joint initiative.</p> <p>In addition, you will find articles on diverse subject matters such as size selective air sampling, potable water and hexavalent chromium. In my opinion this is a good reflection of the diverse nature of our roles as occupational hygienists.</p> <p>And as always, as part of CCOH's committee to disseminate information on occupational hygiene and occupational health issues, you will find information on changing regulations and Upcoming Events across Canada.</p> <p>Happy Readings!</p> <p><b>In this issue...</b></p> <table><tr><td>Letter from the Editor</td><td>Page 1</td></tr><tr><td>Recap of Webinar on CSA Z1000, Health and Safety Management System Summary</td><td>Page 2</td></tr><tr><td>Changing Horses – A discussion of Problems Associated With Changes in Size Selective Sampling</td><td>Page 2-3</td></tr><tr><td>Vessel Potable Water Safety on the East Coast - Samples of Opportunity</td><td>Page 4-6</td></tr><tr><td>Hexavalent Chromium–Cr (VI) – A Review of the US Regulatory (OSHA) Approach</td><td>Page 6-11</td></tr><tr><td>Summary of OHS Legislative Change</td><td>Page 11-14</td></tr><tr><td>Upcoming Events across Canada</td><td>Page 14</td></tr></table> | Letter from the Editor | Page 1 | Recap of Webinar on CSA Z1000, Health and Safety Management System Summary | Page 2 | Changing Horses – A discussion of Problems Associated With Changes in Size Selective Sampling | Page 2-3 | Vessel Potable Water Safety on the East Coast - Samples of Opportunity | Page 4-6 | Hexavalent Chromium–Cr (VI) – A Review of the US Regulatory (OSHA) Approach | Page 6-11 | Summary of OHS Legislative Change | Page 11-14 | Upcoming Events across Canada | Page 14 |
| Letter from the Editor  | Page 1   |                        |        |  |        |   |          |  |          |   |           |                                   |            |                               |         |
| Recap of Webinar on CSA Z1000, Health and Safety Management System Summary  | Page 2   |                        |        |  |        |   |          |  |          |   |           |                                   |            |                               |         |
| Changing Horses – A discussion of Problems Associated With Changes in Size Selective Sampling   | Page 2-3   |                        |        |  |        |   |          |  |          |   |           |                                   |            |                               |         |
| Vessel Potable Water Safety on the East Coast - Samples of Opportunity  | Page 4-6   |                        |        |  |        |   |          |  |          |   |           |                                   |            |                               |         |
| Hexavalent Chromium–Cr (VI) – A Review of the US Regulatory (OSHA) Approach   | Page 6-11  |                        |        |  |        |   |          |  |          |   |           |                                   |            |                               |         |
| Summary of OHS Legislative Change   | Page 11-14   |                        |        |  |        |   |          |  |          |   |           |                                   |            |                               |         |
| Upcoming Events across Canada   | Page 14  |                        |        |  |        |   |          |  |          |   |           |                                   |            |                               |         |

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

---

## **Recap of Webinar on CSA Z1000, Health and Safety Management System**

Yang Ting Shek, CIH, ROH

As part of the Canadian Council of Occupational Hygiene (CCOH)'s continuing commitment to foster educational forums for Canadian occupational health and safety professionals, the second webinar in the series was held on Oct. 10, 2007. As before, this was a joint initiative with the Canadian Centre for Occupational Health and Safety (CCOHS). This second webinar in the series discussed the Canadian Standards Association (CSA)'s Z1000 standard on *Health and Safety Management System* and was presented by Mr. David Zimmerman, Project Manager for the CSA Technical Committee on OH&S Management.

Mr. Zimmerman guided participants through the requirements for implementing an OHS Management System within an organization using the Plan-Do-Check-Act methodology as outline in the standard. This same methodology is found in other popular management system standards such as the ISO 9001 and the ISO 14001.

Eight group hub stations were established across Canada from Burnaby, BC to Dartmouth, NS. In addition, six other private hub stations were established through CCOHS, making a total of 14 hub stations. This was a resounding success for webinar series!

As certification points are important to our audience, a Continuing Education certificate can be obtained from the CCOHS (\$25). This certificate can be used as proof of attendance when claiming maintenance credit for the webinar.

Overall CCOH would like to thank all participants and looks to continue the webinar series in the future with CCOHS at an interval

of twice per year. This frequency appears to be reasonable given the amount of preparation required to develop each webinar and to avoid conflicts with established programming at the provincial organization level.

## **Changing Horses – A discussion of Problems Associated With Changes in Size Selective Sampling**

Lorraine Shaw, B.Sc., CIH, ROH

In doing some research, I came across an article in the December 1993 issue of the *Annals of Occupational Hygiene* by Dr. David Muir, the former Director of McMaster University's Occupational Health Program, entitled "Changing Horses". The article began with the quotation from Abraham Lincoln in June 1864: "It was not best to swap horses when crossing a stream" and discussed the problems associated with converting data from one method of sampling to another. In particular Dr. Muir discussed the "new set of dust sampling criteria which will identify 'alveolar', 'upper airway' and 'nasal' dust", in other words respirable, thoracic and inhalable dust and the difficulties associated with converting data from one method of sampling to another in different environments. He asked the question: "How are TLVs and control limits to be adjusted?"

Fast forward to 2007, the inhalable, thoracic and respirable dust sampling methods are beginning to be used by industrial hygienists; the American Conference of Governmental Industrial Hygienist Threshold-Limit Values (ACGIH TLVs) and provincial Occupational Exposure Limits (OELs) include contaminants with respirable, thoracic and inhalable designations. For example, the current edition of the Ontario OELs and the 2007 edition of the ACGIH TLVs and BEIs include TLVs for nickel and molybdenum measured as inhalable particulate and chromium measured as total dust and iron oxide measured as respirable dust. These different sampling criteria unfortunately eliminate the ability to take one sample, run a metal scan by ICP/MS and measure all metals in one sample.

# CCOH Newsletter

Canadian Council of Occupational Hygiene  
Autumn 2007

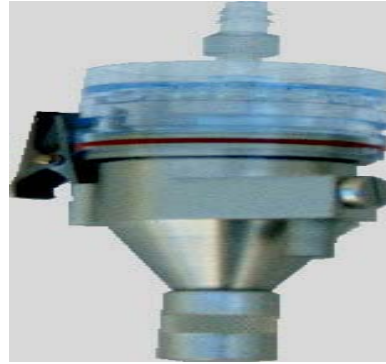
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Three sampling trains must be set up, one for total dust, one for inhalable and one for respirable dust.

Other difficulties arise in the flour dust and sawmill industries. The flour dust and wood dust TLVs have been simultaneously lowered and switched from total to inhalable dust measurements. Inhalable dust samplers collect much greater amounts of dust than total dust samplers, the ratio of which is dependent on the particle size. These industries are presently taking samples to evaluate exposures using the new inhalable criteria.

In addition to these challenges, many industrial hygienists are grappling with the idea of inhalable dust compared with total dust. "Total" by definition implies all of the dust in the air. At first, many people are surprised to find that inhalable dust samplers collect more particulate than total dust samplers, in the range of 5 to 50 times more dust. The "total dust" sampling cassette has no defined sampler acceptance curve or collection efficiency. The inlet acts as a type of critical orifice and limits the particles collected to those less than about 30 - 40 microns. The inhalable dust sampler, by contrast, has a defined sampler acceptance curve, collects particles up to 100 microns in diameter and has a 50 % cut point at 100 microns.

Thoracic TLVs have been listed for metalworking fluids and sulphuric acid. Thoracic samplers are designed to collect particles that collect in the alveolar and bronchial regions. The 50 % cut point for collection efficiency for thoracic samplers is 10 microns. At the present time, only a few thoracic samplers exist. One of these is the BGI 2.69 cyclone. Since this sampler is made is stainless steel, some hygienists are reluctant to use it for sampling corrosive atmospheres of sulphuric acid.



*Fig. 1 Photo of the BGI 2.69 Cyclone (courtesy of the BGI website).*

The whole idea of converting TLVs from total dust to size selective values, as Dr. Muir says, "requires most careful thought." What values should be used? Will the size selective TLVs be better able to protect workers?

I am confident that in the future, the problems associated with size selective sampling will be overcome. Parallel sampling studies are taking place which will provide conversion factors between the different types of size selective sampling and the total dust sampler. Industrial hygiene is an ever evolving field, with improvements in sampling methodology being constantly developed.

*Note: this article is not intended to be an all inclusive discussion of size selective sampling or to promote any particular sampling device, but more to provoke thought on the problems associated with the size selective sampling methods*

#### References:

Muir, D.C.F (1993): "Editorial – Changing Horses". The Annals of Occupational Hygiene, Volume 36, No. 6, pp.591-592.

ACGIH (2007): Threshold Limit Values for Chemical Exposures and Physical Agents & Biological Exposure Indices.

Ontario Ministry of Labour: "Control of Exposure to Biological or Chemical Agents", Occupational health and Safety Act., R.R.O. 1990, Regulation 833, Amended to O. Reg. 607/05.

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

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## Vessel Potable Water Safety on the East Coast - Samples of Opportunity

Clive MacGregor, Senior Marine Chemist, M.Sc., ROH  
MacGregor and Associates (Halifax) Ltd

### Introduction

Safe Potable Water supplies onboard vessels is both regulated by Marine Occupational Health and Safety (MOSH) and industry practice (Centre for Disease Control Vessel Sanitation Program). This requirement is generally approached individually by vessel with some guidance from their fleet. By extension, similar challenges may also be encountered in remote workplaces which rely on private wells on company-owned land or facilities which bunker potable water from other sources (e.g. municipal sources) and in non-occupational settings (e.g. remote northern communities).

One common misconception of potable water is that it only applies to “drinking water.” Most people can make the leap that this should include cooking water but in some circumstances, workers live at the work locations (e.g. vessels, offshore platforms, work camps) and require water for personal use such as showering, brushing their teeth and washing their hands before meals. In some jurisdictions, such as the Canadian offshore petroleum boards, water of potable water quality is required for personal use. Aside from these “personal” uses of water, eyewash and emergency showers are often plumbed into these same potable water systems.

For over three years MacGregor & Associates has been testing and sometimes auditing potable water systems on vessels of opportunity on the East Coast. This article focuses on the marine vessel experience and points to opportunities for improving the management of potable water systems aboard vessels on the East Coast.

### Methods

MacGregor & Associates conducts auditing based on the standards set out by the Center for Disease Control (CDC) Vessel Sanitation Program (VSP) Ch 5.0 Potable Water August 2005 guidance (<http://www.cdc.gov/nceh/vsp/default.htm>).

Testing has included the important on site free chlorine tests to confirm that disinfection levels were sufficient to kill pathogens. During some site visits audits including full chemistry testing were also carried out, but most testing was coliform and free chlorine.

### Results and Discussion

#### *Disinfection - Free Chlorine Levels*

In 2005 49 potable water samples of opportunity were tested for free chlorine aboard 11 vessels on the East Coast. Twenty five (25) samples (51%) had insufficient free chlorine to protect their potable water system against the accidental ingress of bacterial contamination. One sample (2%) showed Total coliform contamination and was unacceptable potable water.

In 2006 51 potable samples of opportunity were tested for free chlorine aboard 8 vessels on the East Coast. Twenty six (26) samples (51%) had insufficient chlorine to protect their potable water system against the accidental ingress of bacterial contamination. One sample (2%) showed Total coliform contamination and was unacceptable potable water.

For these samples in 2005 and 2006 only one vessel out of the 11 (5%) and 8 (12%) respectively achieved safe potable water, including disinfection, continuously.

Shipboard potable water records of free chlorine varied considerably in completeness since in many cases no recording form was provided with the work instruction. Where forms did exist remedial actions after determining low free chlorine levels and the successful result of any remedial action were not consistently being recorded. At one time or other all vessels that practiced chlorination had

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

---

problems effectively chlorinating potable water with either automatic or manual systems.

Some shipboard persons made errors in testing by using the wrong cuvettes or using the total chlorine test instead of free chlorine. Training of these shipboard persons was spotty with no organization having a consistent potable water training program.

## *Other Observations*

Sampling and control of potable water was generally left up to the vessel. Sampling coverage was spotty from once a year to four times a year. Only one of three fleets sampled tested more than just coliform. Testing of free chlorine was often haphazard and could vary from being very good to very poor on the same vessel in the space of a year.

Only one fleet carried out any testing of other contaminants. Of particular interest would be Volatile Organic Compounds that might leach from freshly applied or touched up potable water tank coatings. There have been two instances in the past four years where vessel potable water systems have been taken out of service due to excessive leaching of potable water coatings such as ethyl benzene and xylene.

Fleet managers should carry out better potable water quality oversight reviewing results of tests and audits for common areas of concern. On some vessels return sampling would show the same insufficiencies year after year indicating that little effective oversight was occurring. The lack of effective internal audits of potable water systems has also lead fleets to believe effective potable water control is occurring when it was not.

## **Conclusions and Recommendations**

The following conclusions have been made based on information collected since 2004.

1. Free chlorine levels were not being sufficiently maintained in Potable Water aboard vessels of the East Coast.
2. Records of free chlorine levels and task management to maintain free chlorine levels were generally insufficient.
3. All vessels had problems at some time maintaining free chlorine levels in their potable water systems, if they maintained it at all.
4. There was a lack of refresher training at officer and crew levels in free chlorine testing, dosing and monitoring of potable water systems.
5. Vessels were generally insufficiently sampling (e.g. for coliform or chemistry) and onboard testing (e.g. free chlorine) their potable water systems. Not all vessels carried out annual audits (internal or external).
6. Volatile Organic Compound (VOC) levels and other chemicals should be checked (some fleets do) to determine if other levels are present at acceptable levels (e.g. leaching from potable water coatings). Guidance on appropriate levels of chemical, biological and radiological parameters is also provided by *Health Canada's Canadian Drinking Water Guidelines*.
7. In general there was insufficient managerial review of information collected with feed back to the ships for their learning and benefit. This could lead to the unwarranted belief that the fleet potable water was acceptable.

The following recommendations are presented for consideration:

1. Require free chlorine testing of at least three locations weekly on all vessels all the time, including when along side. Free chlorine should exceed 0.5 mg/L at all locations all the time. This should be periodically checked externally as part of potable water quality control.
2. Provide a free chlorine log form with direct instructions on how to report free chlorine levels, quality control checks and other

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

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- changes as necessary to establish uniform reporting throughout the fleet.
3. Revise or provide work instruction to require appropriate sampling, analyses (onboard and lab), documentation, out of service decisions, preventative/corrective actions and review.
  4. Provide training on system management, not just technical operation, stressing the importance of system integrity (i.e. closed system concept) and documentation.
  5. Plan an annual oversight review of its Potable Water operations in all vessels to assure that safe Potable Water is being provided. This can be full potable water audit (CDC/VSP) or an internal audit. Note that International Safety Management (ISM) (audits are not sufficiently exact to uncover errors in control of potable water quality.

In some unique instances, retrofit of the potable water system may be required. However, the recommendations above have focused on actions that do not involve substantial capital outlays but do require changes to procedures, additional training and report review by Fleet management.

## Hexavalent Chromium–Cr (VI) – A Review of the US Regulatory (OSHA) Approach

Robert W. Lockhart, Ph.D., CIH, ROH  
Golder Associates

Chromium is a naturally occurring element found in rocks, animals, plants, soil, and in volcanic dust and gases. Found in the environment in several different forms, Chromium is both a necessary element for life, and potentially a serious health concern in many industrial operations. Chromium in the valence state (III) occurs naturally in the environment and is an essential nutrient that helps the body use sugar, protein and fat. Chromium (VI) and chromium (0) are generally produced through industrial processes.

Chromium in valence state (VI) has long been recognized as toxic. Early studies and workplace observations demonstrated associations with ulceration and perforation of nasal septa, allergenic contact dermatitis, eye and respiratory irritation, dermal irritation, rhinitis, occupational asthma, kidney and liver damage, gastric pain and discolouration / erosion of teeth. In addition, there is evidence in animals that Chromium (VI) can cause reproductive injury. The evidence in humans is equivocal.

Chromium (VI) can be found in products and processes within the following industries: electroplating, paint manufacture and application (anticorrosive agents), wood preservation (copper-chrome-arsenate preservatives), boiler maintenance (refractory brick and boiler ash), manufacture and use of Portland cement, manufacture of chromium dyes and catalysts, glass manufacturing, and welding. Chromium (VI) exposures may occur when welding because it is used in some stainless steel products and may also be produced by oxidation of other forms of chromium during welding.

Regulations to control worker exposures to Chromium (VI) in the above noted industries were largely based on concerns over organ damage,

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

---

occupational asthma and other health effects as noted above.

Over the past 20 years, evidence that exposures to elements containing Chromium (VI) can cause cancer has been mounting. The International Agency for Research on Cancer (IARC) has determined that Chromium (VI) is a proven cause of lung, nasal and sinus cancers. Studies in many of the industries using Chromium (VI) support this conclusion, including demonstrations of respiratory cancer in the chrome plating industry (Sorahan et al, 1987; Royle, 1975); respiratory cancers including nasal cancer in chromate production (Enterline, 1974; many other studies); lung cancers in chromate pigment production (Davies, 1984; Hayes; 1989; many others); and respiratory and bladder cancers amongst masons (Rafnsson et al, 1986). While respiratory cancers have been demonstrated in stainless steel welders exposed to Chromium (VI), these workers were also exposed to nickel, another known carcinogen (Becker et al, 1991; Simonato et al, 1991).

Ambient exposures to Chromium (VI) in the Canadian urban environment to are exceeding low. Environment Canada (1991) demonstrated mean air concentration of chromium in 12 Canadian cities to be in the range 0.003 – 0.009  $\mu\text{g}/\text{m}^3$ . While the proportion of Chromium VI was not determined in this study, studies (California Air Resources Board, 1985).of US cities showed Chromium (VI) to comprise 3% – 8% of airborne chromium. Assuming that the proportions are the same, the ambient urban air concentration of Chromium (VI) in Canadian cities is approximately 0.00025  $\mu\text{g}/\text{m}^3$ . The Agency for Toxic Substances and Disease Registry (ATSDR) has set a *de minimus* risk level of 0.02  $\mu\text{g}/\text{m}^3$ , suggesting that exposures to Chromium (VI) in the ambient environment are not a concern.

Occupational exposures to Chromium (VI) can occur through inhalation (lung, nasal and sinus cancer risk, occupational asthma), dermal contact (allergenic contact dermatitis, dermal

irritation) or ingestion (kidney and liver damage, gastric pain, erosion and discolouration of teeth) with a range of health outcomes depending on the route of exposure. Recent regulatory changes in the USA have focused on prevention of exposures by inhalation.

The American Conference of Governmental Industrial Hygienists (ACGIH) has established a Threshold Limit Value (TLV) of 50  $\mu\text{g}/\text{m}^3$  (as Cr) for water-soluble chromium (VI) compounds and 10  $\mu\text{g}/\text{m}^3$  for water-insoluble compounds. The National Institute for Occupational Health and Safety (NIOSH), on the other hand, has a Recommended Exposure Limit (REL) of: 1  $\mu\text{g}/\text{m}^3$  (all forms). This recommendation is based partly on the recognition of cancer as a significant health outcome.

In Ontario, the Occupational Exposure Limit (OEL) is based on the ACGIH TLV. Alberta has set an OEL of 50  $\mu\text{g}/\text{m}^3$  for both water-soluble and water-insoluble compounds. British Columbia has adopted the TLVs of most chemicals; however, since the historical OEL for water-soluble compounds in B.C. was: 25  $\mu\text{g}/\text{m}^3$  this value has been retained. The OEL for water-insoluble compounds is 10  $\mu\text{g}/\text{m}^3$ . Most other Provinces and the Federal Government base their OEL for Chromium (VI) on TLV established by the ACGIH.

The US Occupational Safety and Health Administration (OSHA) Permissible Exposure Limit (PEL) was 100  $\mu\text{g}/\text{m}^3$  as chromate or 52  $\mu\text{g}/\text{m}^3$  as chromium. Following a 1993 petition to OSHA, and subsequent law suites in 1993 and 1997, the Court of Appeals ordered OSHA to prepare a final standard on Chromium (VI) by February 2006.

OSHA originally proposed a standard of 1  $\mu\text{g}/\text{m}^3$ ; however, following public review, a new PEL of 5  $\mu\text{g}/\text{m}^3$  with an Action Level of 2.5  $\mu\text{g}/\text{m}^3$  was established. The new Standard is based partly on the technical feasibility of both measurement and engineered controls. Based on the new PEL, three new industry-based Standards were established:

- 1910.1026: General Industry
- 1926.1126: Construction

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

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## ➤ 1915.1026: Shipyards

These Standards are similar, but not identical. The following discussion reflects the common characteristics of the three Standards. All three Standards are prescriptive and the primary characteristic is the requirement for industry to achieve compliance using engineered controls. Special provisions, again based on control feasibility, were established for the aeronautics industry. In this industry, engineered controls are required to reduce exposures to 25 µg/m<sup>3</sup>. Respiratory protection may be used to further reduce worker exposures to 5 µg/m<sup>3</sup>.

For large employers, engineering controls were required to be implemented by no later than November 27, 2006, while small employers were given until May 31, 2007, to implement appropriate controls.

The Standards cover occupational exposures to all forms of Chromium (VI) and its compounds, except during the application of pesticides and work with Portland cement. In addition, an employer is excused from the requirements of the Standards if the employer has objective data demonstrating that a material containing chromium or a specific process, operation, or activity involving chromium cannot release dusts, fumes, or mists of Chromium (VI) in concentrations at or above 0.5 µg/m<sup>3</sup> as an 8 hour time weighted average (TWA) under any expected conditions of use.

The National Institute for Occupational Safety and Health (REL, 1 µg/m<sup>3</sup>) has recently indicated that it will undertake a review of the existing recommended exposure limit.

### **Exposure Determination**

Each employer who has a workplace or work operation covered by this OSHA Regulation shall determine the 8-hour TWA exposure for EACH employee exposed to Chromium (VI). This determination shall be made in accordance by either scheduled monitoring or

performance-based demonstration of exposure control. Performance-based demonstration of acceptable control allows use of historical monitoring data provided that the data quality meets the requirements of the new regulation. Employers must also allow worker representatives to observe all exposure monitoring which is undertaken.

Based on initial monitoring results, the following monitoring schedule must be implemented:

- Exposures above PEL: Monitor every 3 months
- Exposures at or above Action Level: Monitor every 6 months;
- Exposures below Action Level: Monitoring can be discontinued.

Statistically representative monitoring of worker groups is acceptable; however, very specific and detailed records must be developed and retained (for 30 years). In addition to keeping air monitoring results; records of sampling and analytical methods and evidence of their accuracy; and characteristics of the operation or process being sampled; employers are responsible for retaining information of the individuals sampled and how they represent the work group, the characteristics of Chromium (VI) containing products to which workers were exposed during monitoring, and other objective data.

### **Methods of Compliance**

Exposure controls are required if potential exposures are above the Action Level (2.5 µg/m<sup>3</sup>). Control of exposure to atmospheric contaminant must be achieved by engineered means rather than reliance on use of respirators or rotation of workers. In the regulation preamble, it is noted by OSHA that only the best of available engineering designs will be effective. If engineering controls are not enough, short-term use of respiratory protection is allowed. If respirators are used a respirator program is required and each worker must be fit tested. Respirators specified are N95 or better.

As part of the control program, employers must designate a 'regulated area', not unlike the "hot zone" of under US OSHA Regulation CFR

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

---

1910.120 for control of worker exposures to hazardous chemicals when they are working on contaminated properties. The Regulation states that the regulated area must be kept as small of possible by use of high efficiency fume capture technologies. The Regulation also states that when skin or eye contact is likely protective clothing must be provided. Employers must ensure that the protective clothing is used by all workers in the regulated area, and that all protective clothing be removed at end of shift or end of task, whichever comes first. Employers must store and transport protective clothing in sealed and labeled containers. Clothing maintenance is a designated responsibility of the employer as no employee may remove from the workplace protective clothing that has been used in the regulated area.

Again, when skin contact with Chromium (VI) is probable, and in a manner similar to the hazardous waste regulation, employers must provide to employees dirty and clean change rooms, washing facilities and designated eating and drinking areas. Workers are not allowed to take food or drink into the potentially contaminated area.

## Medical Monitoring

Similar to the hazardous waste regulation, medical monitoring of workers exposed to Chromium (VI) must be made available to employees, at no cost, and at a reasonable time and place. All workers who are, or may be, exposed at, or above, the Action Level ( $2.5 \mu\text{g}/\text{m}^3$ ) for 30 or more days per year, those workers experiencing signs or symptoms of chromium (VI) and all workers who are exposed to Chromium (VI) during an emergency must be provided with medical monitoring.

The medical monitoring must be provided within 30 days of work assignment and annually thereafter.

## Communication

As part of the worker training required for compliance with this Regulation, the employer shall ensure that all exposed employees can demonstrate knowledge of the content of the Regulation and knowledge of the purpose and a description of the medical surveillance program.

## Air Monitoring

One of the challenges faced by OSHA when establishing this new Regulation was the sensitivity of existing air monitoring procedures. For example, NIOSH Method 7600 is unable to measure Chromium (VI) at  $1 \mu\text{g}/\text{m}^3$ . With a PEL at  $5 \mu\text{g}/\text{m}^3$ , both the NIOSH Method 7600 and OSHA Method ID-215 are viable monitoring methods for determination of worker exposures to Chromium (VI). Galson Laboratories (2006) has also demonstrated that at the Action Level or above there is a good correlation between results collected using these two methods. Even so, Carr (2007) has reported technical challenges when sampling for Chromium (VI) including the source of the PVC filter media, debris and turbidity on filter blanks causing background interferences, and the suitability of different filter extraction solvents for NIOSH Method 7600.

In some environments, such as welding, there will be major challenges in assessing worker exposures to Chromium (VI). First of all, a sample separate from that used to assess worker exposures to other elements will be required. In addition, welding fume exposures are highly influenced by differences in welding methods, techniques and production rates. The implications are that statistically representative sampling may not be acceptable, and that the evaluation of the exposures of every worker may be required.

There will also be many logistical and monetary constraints on the monitoring that is mandated under this regulation. For those employers with large numbers of workers to assess, screening tools may be of value. One such screening tool is NIOSH Method 7703. This method of Chromium (VI) exposure assessment relies on sample collection on PVC filters just as for NIOSH Method 7600 and OSHA Method ID-215. However, instead of submitting samples to a laboratory for

# CCOH Newsletter

Canadian Council of Occupational Hygiene

Autumn 2007

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analysis, a skilled technician can screen the samples for Chromium (VI) using a field-portable spectrophotometer. The Method required the extraction of the sample filter using a buffer solution, filtration through an anion exchange column and generation of a magenta chromium complex of 1,5-diphenyl carbazide. All steps can be completed in a clean workplace environment using portable equipment. Validation of the Method showed 93-98 % recovery of Chromium (VI) from PVC filters.

## Conclusions

U.S. Industry has been challenged with a new, very costly exposure control requirement. Even so, the OSHA cost analysis has demonstrated that the saving in lost work-days, medical costs and shortened lives warrants this investment. The Regulation is prescriptive with a major emphasis on the implementation of engineered exposure controls and air monitoring. As a result, some employers and perhaps some industries may be driven out of business of off-shore. Controls mandated are not dissimilar from those currently in existence for work at contaminated sites.

Other Regulators, such as Human Resource and Skills Development Canada (HRSDC) and individual Provinces may initiate reviews of existing OELs. On the other hand, the ACGIH does not have a review of Chromium (VI) on its current list for intended review. Those Regulators which rely on ACGIH TLV for determination of OELs may, however, consider other means of tightening control on worker exposures to Chromium (VI). In B.C., for example, the Regulation mandates that exposure risk assessments be conducted by a competent person. The widely published and well documented cancer health risk associated with Chromium (VI) exposures may become a factor in establishing control requirements within B.C. and other individual Canadian Provinces.

Practices of exposure assessment in Canada may also be impacted by this new US Regulation without the need for regulatory changes. Most Canadian Regulators already specify that occupational hygiene sampling must be representative. While this requirement may not have been enforced historically, it is probable that Regulators will place more emphasis on assessment of whether or not sampling of worker exposures to Chromium (VI) truly represents the exposures of individual work groups.

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# CCOH Newsletter

Canadian Council of Occupational Hygiene  
Autumn 2007

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## Summary of OHS Legislative Changes July to November 2007

By Michal Zitnik, ROH, CIH

### Federal

#### Proposed Amendments to COHS Regulation Incorporate Provisions for Ergonomics-Related Hazards

Proposed amendments to the Canada Occupational Health and Safety (COHS) Regulations, published June 27, will include provisions for ergonomics related hazards.

Part XIX "Hazard Prevention Program" of the current regulation requires the employer to develop, implement and monitor an appropriate program for the prevention of hazards. Under the proposed amendments, employers must ensure that ergonomics-related hazards are identified and eliminated, as much as is reasonably possible, by the use of engineering controls, provision of protective equipment, clothing, devices, or

materials, and management of the exposures and work patterns.

Proposed Regulations Amending the Canada Occupational Health and Safety Regulations, pursuant to Part II of the *Canada Labour Code*, were published in the June 23, 2007 edition of *Canada Gazette Part I*.

More information can be obtained at Human Resources and Social Development Canada website: <http://www.hrsdc-rhdsc.gc.ca>

#### Canada Shipping Act, 2001 in Effect July 1

The *Canada Shipping Act, 2001* (CSA 2001) which took effect on July 1 replaces the earlier act to become the principal legislation governing the safety of marine transportation. According to the government, the new act:

- promotes safety in marine transportation and provides better protection for the marine environment through new and enhanced regulations;
- shifts from an inspection-based regime to a compliance-based regime where vessel operators are encouraged to take a more active approach to safety; and
- introduces a regime to impose administrative monetary penalties on noncompliant ship owners and operators.

CSA 2001 applies to Canadian vessels operating in all waters and to foreign vessels operating in Canadian waters, ranging from canoes and kayaks to cruise ships and tankers.

More information can be obtained at Transport Canada website:

<http://www.tc.gc.ca>

### Alberta

#### Building, Fire, and Plumbing Codes Approved and in Force September 2

Alberta's Safety Codes Council (SCC) announced in June that the 2006 Alberta building, fire, and plumbing codes have been approved for adoption by regulation and the codes came into force September 2nd of this year.

# CCOH Newsletter

Canadian Council of Occupational Hygiene  
Autumn 2007

---

More information can be obtained at the Alberta Safety Codes Council website:  
<http://www.safetycodes.ab.ca>

## Director's Approval for Residential Roofer's Fall Protection Expired October 31, 2007

As of October 31, 2007, all employers in the roofing industry must comply with the fall protection provisions in Part 9 of the OHS Code. This follows a six month transition period that followed the expiration of the OHS Code's Part 38, (Residential Roofing). This provided roofing industry employers the opportunity to incorporate traditional fall-protection options into their operations.

More information can be obtained form Workplace Health and Safety Contact Centre  
Toll-free: 1-866-415-8690

## Proposed Legislation Will Prohibit Smoking in the Vicinity of All Public Places and Workplaces

Alberta's Bill 45, *Smoke-free Places (Tobacco Reduction) Amendment Act, 2007* which passed second reading June 13 amends the province's *Smoke-free Places Act* to prohibit:

- smoking in all public places, workplaces, public vehicles, or within a prescribed distance from a doorway, window, or air intake of a public place or workplace;
- tobacco product displays in retail outlets; and
- tobacco sales in pharmacies and on post-secondary campuses.

Workplace is defined as all or any part of a building, structure or other enclosed area in which employees perform the duties of their employment and includes reception areas, corridors, lobbies, stairwells, elevators, escalators, eating areas, washrooms, lounges, storage areas, laundry rooms, enclosed parking garages, and work vehicles.

The regulation is scheduled to take effect January 1, 2008.

More information can be found on Alberta Health and Wellness website:

<http://www.health.gov.ab.ca>

## **British Columbia**

### New BC Guideline for Farm Labour Contractors Defines Health, Safety and Transport Responsibilities

In response to an increased incidence of injuries to BC agricultural workers both on the job and in transit to job sites, WorkSafeBC issued a new guideline July 5 for farm labour contractors and growers. The guideline takes immediate effect.

*G3.1-2 Farm labour contractors and growers - Responsibilities and OHS programs* describes circumstances in which the contractor has an obligation to establish a formal occupational health and safety program and lists the elements that would typically be covered in the programs. The guide also:

- identifies circumstances in which informal programs are required and what elements they would include;
- discusses the occupational health and safety responsibilities of growers who use contractors to provide services of farm workers in their operations; and
- provides five examples (worker transport vehicles, personal protective equipment, first aid, protection from hazardous materials, and training) of how the responsibilities of farm labour contractors apply to the protection of farm workers, in comparison to the responsibilities of the grower.

Farm labour contractors (FLCs) are considered employers because of the nature of their contractual arrangements with farm workers. As such they have all the responsibilities of employers under the *Workers Compensation Act* and the Occupational Health and Safety Regulation.

More information can be found on WorkSafe BC website:

<http://www.worksafebc.com>

# CCOH Newsletter

Canadian Council of Occupational Hygiene  
Autumn 2007

---

## Proposed Legislation Will Prohibit Smoking in the Vicinity of All Public Places and Workplaces

In June 2007, British Columbia's Ministry of Health launched public consultations of a regulation under its proposed Tobacco Control Regulation under the *Tobacco Control Act* (approved in March 2007). The regulation will limit the promotion and sale of tobacco products and ban smoking in all indoor public and workplaces, including smoking within three metres of most doorways, windows that open, and air intakes. Designated smoking rooms will no longer be permitted.

The regulation is scheduled to take effect January 1, 2008.

More information can be found at the BC Ministry of Health website:  
<http://www.gov.bc.ca/health>

## **Ontario**

### Asbestos abatement training requirements in force November 1

New provisions dealing with asbestos abatement training programs will require that workers and supervisors involved in Type 3 operations must successfully complete an asbestos abatement worker training program approved by Ontario's Ministry of Training, Colleges and Universities.

Moreover, section 20 of O. Reg 278/05, Designated Substance-Asbestos on Construction Projects and in Buildings and Repair Operations, stipulates that every employer shall ensure that every worker and supervisor involved in a Type 3 operation has successfully completed the appropriate Asbestos Abatement Training Programs approved by the Ministry of Training, Colleges and Universities

Section 8 of O. Reg 278/05, *Ongoing asbestos management in buildings after transitional period* also came into force November 1, 2007.

More information can be obtained at the Ontario Ministry of Labour website:  
<http://www.labour.gov.on.ca>

### Ontario Government Proposing New/Updated OELs for 21 Workplace Substances

Ontario's Minister of Labour, Steve Peters, announced July 23 that the government is proposing new/updated occupational exposure limits (OELs) for 21 hazardous workplace substances. The comments on the proposed changes were due September 28, 2007.

More information can be obtained at the Ontario Ministry of Labour website:  
<http://www.labour.gov.on.ca>

## **Saskatchewan**

### Amendments to Saskatchewan's Occupational Health and Safety Regulations Take Effect October 2007

Saskatchewan's Minister of Labour, David Forbes, announced, July 27, that amendments to the province's Occupational Health and Safety Regulations will take effect October 2. The amendments, published in the August 10 edition of *The Saskatchewan Gazette*, include changes to the requirements for: fall protection; powered mobile equipment; explosion risks in the oil and gas industry; contamination limits; and respiratory protective devices.

The revisions follow a review of the occupational health and safety legislation by the Occupational Health and Safety Council

More information can be obtained from the Saskatchewan Department of Labour website:  
<http://www.labour.gov.sk.ca>

### Changes to Act to Address Harassment in the Workplace

# CCOH Newsletter

Canadian Council of Occupational Hygiene  
Autumn 2007

---

Saskatchewan's Bill 66, *The Occupational Health and Safety (Harassment Prevention) Amendment Act, 2007* received royal assent May 17 and comes into force on proclamation. The bill, among other things, expands the definition of harassment in the province's *Occupational Health and Safety Act, 1993*, to address personal harassment in the workplace.

For more information contact: Saskatchewan Labour, Occupational Health and Safety website: <http://www.labour.gov.sk.ca>

## Upcoming Events across Canada\*

\*Where provided to CCOH, information requiring costs and maintenance points are shown. Where such information is not provided, readers are advised to contact course providers for verification.

### Manitoba

AIHA Manitoba Section - Annual General Meeting Keynote address Emerging Issues in Radon with Dr. Harry Johnson.  
January 18, 2008, CanadaInn PoloPark  
<http://www.aiha.org/LocalSections/html/manitoba/index.htm>

### Ontario

ALARA Industrial Hygiene Services - **Indoor Environmental Quality Evaluation Workshop**. This course will provide participants with the practical skills and theoretical knowledge required to conduct meaningful and effective IAQ/IEQ investigations. CRBOH and ABIH award 2 maintenance points for attendance.  
Nov. 22-23, 2007  
Toronto, Ontario  
<http://www.alara.ca/ieq1.html>

### Québec

L'Association québécoise pour l'hygiène, la santé et la sécurité du travail (L'AQHSST) – **Le Grand Rendez-Vous**

Le 21 et 22 novembre 2007 à Montréal  
<http://www.grandrendez-vous.com/accueil.asp>

L'Association québécoise pour l'hygiène, la santé et la sécurité du travail (L'AQHSST) – **Le Forum santé et sécurité du travail**

Le 9 avril 2008 à Québec  
<http://www.aqhsst.qc.ca/>

### Atlantic Canada

Atlantic Provinces Section of the American Industrial Hygiene Association - **What's New in Occupational Health Disease?**

November 9, 2007  
Saint John's Newfoundland  
<http://www.aihaaps.ca/main/main.html>