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FORUM

Jeff Mallany, MSc, ROH

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President's Message

It has been almost one year since I became president of OHAO. I would like to thank the organization for giving me the opportunity. I would also like to thank the board of directors for their vision, commitment and service to OHAO and for supporting me in my role. Some of our board members will be leaving the board after the March AGM. To them, I would like to extend my gratitude on behalf of OHAO. Following the AGM, some new board members will be elected to various positions, I would like to both thank them for volunteering and welcome them to the board.

This year has been an exciting one on the Board of Directors. We took some steps this year to focus our strategic plan for the organization. Although we have had a strategic plan for a number of years, this year as a board we ran a workshop to really dive into our vision for OHAO and to put some tangible goals on our initiatives. I am happy to report that we were successful at achieving the goals that we set out to accomplish.

The goals that we set for OHAO this year included a number of initiatives designed to raise the profile of OHAO and to promote the field of Occupational Hygiene in the province. I believe that strengthening our relationship with partner organizations, academic institutions, and by increasing our presence at industry events, we can continue to grow the membership of the organization and be seen as a leader in the field of Occupational Hygiene at a local, national and even international level. We have also tried this year to focus the work of the board on value to our members which translated into the launch of our first webinar in fall 2019, a series of excellent symposia, PDCs, regional meetings and renewed focus on recruiting and supporting the volunteers who keep OHAO moving forward.

As a volunteer run organization, OHAO is always looking for members to take an active role in the organization. There are many ways to make a contribution to OHAO or to the field of Occupational Hygiene. So, volunteer for a committee. Become a mentor. Contribute to the forum. We are always looking for new topics for PDCs and symposium, please make a suggestion, or better yet, volunteer to speak on a topic. For those of you who take time out of your personal and professional lives to contribute to OHAO in some fashion, thank you and I look forward to a great 2020.

Thank you and have a safe day.

Jeff Mallany, MSc, ROH

Editor's Message

I hope this issue finds you well. It has been a very busy few months into 2020. Changes in Ontario regulations may have had some workplaces scrambling to comply with the January 1st effective date. I am looking forward to how it will shape the focus/approach of businesses, with the hierarchy of controls and respiratory protection sections made more clear and definitive.

Personally, I have recently taken over the role of RSO for our company (having been Alternate RSO for the last 8 years). For the past month, I have been busy putting together the package for our radiation licence renewal. If any of you have had to do this, you feel my pain. Also, it is my first time doing this, so I feel the pressure to get everything right.

In my preparation, in addition to taking the RSO course again (thank you to the company who shall remain nameless for squeezing me in), I also listened to a recent CNSC webinar ("Meet the Regulator") which was very helpful, as it was geared to RSOs. For more information, visit the CNSC website at http://cnsc-ccsn.gc.ca/.

Safe and well,

Negin Ghanavatian, MHSc.

Email articles to: neginghanavatian@gmail.com

OHAO Updates

OHAO COVID-19 Statement:

OHAO is concerned about the spread of the COVID 19 virus. We encourage Ontario employers to monitor and implement the controls outlined by public health authorities to reduce the spread of this virus in Ontario workplaces.

For hygienists providing guidance to their employers or clients, we recommend relying on credible sources of information to make professional judgments such as those posted on the Infection and Prevention Control Canada (IPAC Canada) website https://ipac-canada.org/.

Save the Dates Fall 2020:

The OHAO 2020 Fall PDC will take place on Wednesday, October 21, 2020 and the 2020 Fall Symposium will take place on Thursday, October 22, 2020 at the Centre for Health and Safety Innovation, Mississauga.

Renew Online Today:

If you have not already renewed your OHAO membership for 2020 simply log in to your profile on the OHAO website, under the "Members Only" dropdown menu click on "2020 Member Renewal" to renew your membership.

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Enquiries or suggestions should be directed to:

Editor - OH Forum
c/o OHAO
6700 Century Ave Suite 100
Mississauga, Ontario L5N 6A4
Tel: (905) 567-7196
Fax: (905) 567-7191
www.ohao.org

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Mission Statement

To advance the profession of occupational hygiene and to serve the interests of our members by:

- sponsoring professional development and training;
- promoting public and legal recognition;
- developing partnerships with stakeholders;
- providing public education;
- fostering communication and networking.

rev. May 2010

Noisy News: The Health Canada Study on Wind Turbines Noise Effects

Alberto Behar

Introduction

Wind turbines together with solar panels are the latest green source for electricity. A wind turbine, also known as a windmill, is a device that converts the wind's kinetic energy into electrical energy. The first known practical wind power plants were built in Persia (now Iran), during the 7th century. The first electricity-generating wind turbine was a battery charging machine installed in July 1887 by Scottish academic James Blyth to light his holiday home in Scotland.[1]

Today, utility-scale land-based wind turbines that reach 120 meters in height with rated power above 2.5 megawatts (MW) are commonplace. Off-shore turbines can be double this size and have already exceeded 8 MW outputs. As of today, the world's largest offshore wind turbine is 260m high and has a rated power capacity of 12 MW. Presently, in Ontario, 96 wind farms with some 2,500 turbines generate over 5,000 MW equivalent to almost 10% of the electricity demand.[2]

Their obvious presence on the landscape and their tendency to be installed in relatively quiet rural areas has meant that hosting communities have sometimes voiced strong objections to wind energy developments. Some of the objections are attributed to claimed impacts on health from exposure to wind turbine emissions, either visual (e.g. shadow flicker, blinking lights, visual intrusion) and/or acoustical. Wind turbines have been blamed for a myriad of adverse health effects that include, but are not limited to, cancer, impacts on sleep, cardiovascular disease etc.[3]

One of the more severe objections to their existence deals with noise. Wind turbines generate noise from several sources. Aerodynamic noise originates from the motion of air around the blades. Mechanical noise generates from mechanical and electrical components within the wind turbine nacelle.

In Ontario (and in several countries in the world), the minimum distance turbines are authorized to be installed is 550 m from non-participating dwellings. At this setback, sound pressure levels are typically below 40 dBA.[4] Ontario restricts both the setback and the sound pressure level, but limits on the allowable sound pressure levels are scaled based on wind speed. The basic idea, which is not always borne out under certain meteorological conditions, is that higher wind speed will make wind turbine noise less audible.

Noise generated by wind turbines is complex. This may, at least partially, explain why it appears to be more annoying than other types of noise (transportation, industrial, etc.) at equivalent sound levels. Moreover, they tend to be installed in rural areas where there may be a greater expectation for—and value placed on—peace and quiet. According to its characteristics, wind noise can be:

1. Tonal: Tonal sound is defined as sound at discrete frequencies. It is caused by components such as meshing gears, non-aerodynamic structural resonances, or unstable flows over holes or slits or a blunt trailing edge. Tonal sound does lead to higher annoyance; however it is not usually a problem in modern turbines.
2. Broadband: This is sound characterized by a continuous distribution of sound pressure with frequencies greater than 100 Hz. It is caused by the interaction of boundary layer turbulence with the trailing edge of the turbine blades and is also described as a characteristic "swishing" or "whooshing" sound. The variation in sound level and character is called "modulation" or "amplitude modulation" and is probably the most predominant source of noise in modern wind turbines. Even low amplitude modulation can make wind turbine noise perceptible and thus contribute to annoyance.
3. Low Frequency: Low frequency sound contains frequencies in the range 20 to 100 Hz and is mostly associated with downwind rotors (turbines with the rotor on the downwind side of the tower which are no longer common). It is caused when the turbine blade encounters localized air stream disturbance from the tower.
4. Infrasound: Infrasound includes energy at frequencies below 20Hz. It is generated by air turbulence impinging on the blade leading edge, but probably more

so by flow perturbation over the blade as it passes in front of the tower. The dominant sources of infrasound continue to be a source of investigation, because infrasound is well below even the most sensitive thresholds of audibility.

5. Impulsive: Impulsive sound can be described as regular short acoustic impulses or a "thumping" sound occurring at the rate of about one per second (the blade passing frequency for a 3-bladed turbine with a rotation rate of 20 RPM). It is caused by the interaction of wind turbine blades with disturbed air flow around the tower of a downwind machine.

Wind Turbine Noise (WTN) Effects on Human Health

Many studies have been undertaken all around the world to answer the basic questions of whether there are harmful effects from the noise generated by the turbines and, if yes, what are they and what risk do they represent.

As a way of adding to the science base in the area, in 2012, Health Canada with Statistics Canada launched a study to provide federal advice in acknowledgement of the community health concerns. The main objectives were as follows:

- Investigate the prevalence of health effects or health indicators;
- Derive exposure response relationships between WTN levels and self-reported and objectively measured health outcomes; and,
- Investigate the contribution of low frequency noise (LFN) and infrasound as a potential contributing factor towards adverse community reaction.

The study was performed in Ontario and Prince Edward Island, because there were a sufficient number of homes within the vicinity of wind turbine installations. The study consisted of three parts:

- An in-person questionnaire to randomly selected participants living at varying distances from wind turbine installations;
- Collection of objectively measured outcomes that assess hair cortisol, blood pressure and sleep quality; and,
- Over 4000 hours of WTN measurements to support the calculation of WTN levels at residences captured in the study scope.

In total, 1238 dwellings near 400 turbines where studied, which makes the study one of the largest ever performed.

Summary of Results

Health Canada has published several journal articles on the study along with a Summary of Results on the Government of Canada website.[5] Briefly, results of the study show that there was no statistically significant association between calculated long-term outdoor A-weighted wind turbine noise levels and any of the self-reported and objectively measured outcomes. This included, but was not limited to: migraines, dizziness, tinnitus, sleep disorders, perceived, stress levels, chronic pain, heart disease, blood pressure, heart rate, hair cortisol levels, actigraphy measured sleep outcomes (awakenings, motility levels)

This conclusion means that there was no pattern between reported health effects of people living close to wind turbines. However, people that lived in areas with higher WTN levels were more likely to be highly annoyed by several wind turbine features including the noise, shadow flicker, visual impacts, vibrations and the blinking lights on top of turbines that serve as aircraft warning signals.

Although the Health Canada study remains the largest conducted to date in Canada, more recently, scientists at the University of Waterloo conducted interesting research that examined the potential impact that WTN may have on objectively measured sleep. Publications from the study show that there was no association between WTN and sleep. Specifically, their measures of sleep taken prior to and after the wind turbines became operational, where statistically equivalent.

Of Interest:

Conferences on Wind Turbine noise are conducted biennially by the European branch of the International Noise Control Engineering (INCE – Europe, https://www.inceeurope.org/). The post-conference report of latest one, Wind Turbine Noise 2019 can be found at the following site: https://www.windturbinenoise.eu/content/conferences/8-wind-turbine-noise-2019/.

1. https://en.wikipedia.org/wiki/Wind_turbine
2. https://canwea.ca/wind-energy/ontario-market-profile/
3. Chapman has collected 247 symptoms attributed to wind turbines (https://ses.library.usyd.edu.au//bitstream/2123/10501/5/Wind_Disease_List.pdf).
4. https://www.ontario.ca/page/noise-guidelines-wind-farms
5. Health Canada (2014) Wind Turbine Noise and Health Study: Summary of Results https://www.canada.ca/en/health-canada/services/health-risks-safety/radiation/everyday-things-emit-radiation/wind-turbine-noise/wind-turbine-noise-health-study-summary-results.html

Professional Judgment, Common Sense & Legal Quicksand

E.A. Sullivan, PhD, CIH, ROH, CChem

Professional judgment is the hallmark of a competent professional. Sometimes, however, judgment gets clouded and common sense overlooked. Legislators and enforcement agencies never intend to violate common sense in interpretations, policies and practices, but it can happen even for government professionals, as illustrated by Michael Grey[1] in a recent issue of OH Forum. The Canada Labour Code requires safety equipment as prescribed and the regulations specify 'a respiratory protective device that is listed in the NIOSH Certified Equipment List'. NIOSH lists no respiratory protection against radiological hazards, such as tritiated water vapour of concern to Atomic Energy of Canada Limited (AECL).

AECL opted for a military respirator appropriate for protection against radiological gases and vapours under battlefield conditions. Labour Canada – a predecessor to Human Resources and Skills Development Canada (HRSDC) – had been aware of this ambiguous regulatory situation since the 1970s, yet, only in 2011 cited AECL for contravening the letter of the Code and Regulations. At appeal,[2] the Tribunal ruled against HRSDC: for an obligation to be compellable, it is not sufficient to have only a statement of requirement; achievability is essential, so that compliance can be sought and compellability ensured.

In testimony, an HRSDC professional opined that 'if AECL was correct that there were no [NIOSH-certified] respirators for its intended use(s), they could simply appeal the direction'. Default to 'letting the court decide' is a staple of TV crime drama, but abdicates professional responsibility and borders on negligent enforcement. In an object lesson for professionals in enforcement – and uncritical 'checklist' enforcers – the Tribunal Appeals Officer ruled that the 'enforcement authority of a health and safety officer is not a "prove me wrong exercise".

That authority entails the obligation to act responsibly in requiring a party to comply, to do something that it is really obliged to do. This entails, on the part of the enforcing party, acquiring knowledge of the obligation or obligations one is seeking to comply with, and this goes beyond the mere consideration of the words expressing the obligation(s) sought to be complied with.' In this example, common sense, professional judgment, management oversight and legal expertise appeared wanting. The legislation was amended in 2019.[3]

Strict adherence to the law was integral to a very recent case at the Supreme Court of Canada. In 2009, at a Montreal Metro subway station, Bela Kosoian was arrested, handcuffed, detained for about 30 minutes, searched, and charged by the municipal police for ignoring an escalator sign marked: CAUTION Hold Handrail, and for obstruction of police. The (by)law[4] seemed clear: '…it is forbidden for any person to…disobey a directive or pictogram, posted by the Société' (de transport de Montréal, STM); however, in 2012, a Municipal Court judge dismissed the charges saying it was not clear that holding the handrail was a legal obligation. Ms. Kosoian, subsequently sued the City of Laval, STM, and the arresting officer – acting as agent for the STM – for damages, pain, suffering and inconvenience.

The suit was rejected[5] (2015). In superlative terms, the judge praised the officer's conduct as exemplary and irreproachable, demonstrating professionalism to the highest standards of the police profession and following in all respects the instructions and training given to the police; the regulation was said to be 'very adequate' (contrary to the prior ruling of the Municipal Court judge!) and its implementation irreproachable. Ms. Kosoian's behaviour was castigated as 'inconceivable, irresponsible and contrary to the basic rules of citizenship of our society'. That decision was upheld (2-1) by the Quebec Court of Appeal[6] (2017), describing Ms. Kosoian as 'the author of her own misfortune'. The case progressed to the Supreme Court of Canada which ruled (2019) unanimously (9-0) that the STM bylaw created no offence…the yellow sign was a warning, not a directive, and Ms. Kosoian bore none of the blame.[7,8] The court was scathing of the arresting officer, the STM and the lower court rulings.

Incredibly, it took four trials and 13 judges over a decade to establish definitively that advisory statements are not mandatory requirement—a distinction that even the

newest Ministry of Labour, Training and Skills Development inspector is trained to appreciate. As one commentator put it: 'The insanity of this whole situation should be immediately obvious to any right-minded observer.'[8] Insanity perpetuated by professionals.

These two cases illustrate a number of self-evident issues:

- Employers (or people) cannot be compelled to comply with orders (which are unlawful or with which it is impossible to comply);
- Legislation can be ambiguous, deficient or wrong;
- Professional training, although well intentioned, can be misguided;
- Common sense is crucial to interpretation and enforcement; and
- Management should promptly address ambiguity or conflict in enforcement.

Compliance with legislation requires sensitivity to the ramifications of interpretation and requirements by all parties – employers, OHS consultants and enforcement agencies. It can be costly, time consuming and humbling to ignore common sense.

References

1. M Grey. Respiratory protection for tritiated water vapour. OHAO. OH Forum, 2019. 42(3):5,6.
2. Occupational Health and Safety tribunal Canada. 2013-07-24. Case No.2012-04. http://www.canada.ca/content/dam/ohstc-tsstc/documents/pdf/programs/decisions/2013/021-ohstc-13-021.pdf
3. Canada Occupational Health and Safety Regulations. Part XII, SOR/86-304, s.12.13(3).
https://laws-lois.justice.gc.ca/eng/regulations/SOR-86-304/page-35.html#docCont
4. Regulation R-036 s.III(4)(e) http://www.stm.info/fr/a-propos/gouvernance-d-entreprise/les-reglements-et-politiques/reglement-r-036
5. Cour du Québec. Kosoian v. Laval (Ville de) No.540-22-013703-094, 11 August 2015. https://www.canlii.org/fr/qc/qccq/doc/2015/2015qccq7948/2015qccq7948.html
6. Québec Cour d'Appel. Kosoian v. STM. No.500-09-025644-154. 5 December 2017. https://www.canlii.org/fr/qc/qcca/doc/2017/2017qcca1919/2017qcca1919.html
7. Kosoian v. STM. 29 November 2019. https://www.scc-csc.ca/case-dossier/cb/2019/38012-eng.aspx
8. https://www.msn.com/en-ca/news/politics/commentary-an-important-victory-for-bela-kosoian-and-the-rights-of-all-canadians/ar-BBXzjMe?ocid=spartandhp
Online references accessed 10 January, 2020

Health Physics

—Column Editor—
Michael Grey, CHP, ROH
SAIC Canada

Nyonoksa Radiation Accident

On August 8, 2019, Western monitors detected a large explosion at a Russian military test site near Severodvinsk on the coast of the White Sea, almost 1200 km due north of Moscow. Two days later, Russia's State Atomic Energy Corporation (Rosatom) said that the accident involved "isotopic power sources," and that the blast had caused the death of five employees. On August 26th, Russia's Federal Service for Hydrometeorology and Environmental Monitoring, Roshydromet, revealed that the Comprehensive Test Ban Organization (CTBO) air monitoring station at Severodvinsk detected a mixture of short-lived (half-lives of hours or days) isotopes of barium, lanthanum and strontium in the hours after the accident . Soon afterward, the monitoring station was taken offline.

In a speech to the United Nations General Assembly on October 10, 2019, Thomas DiNanno, US Deputy Assistant Secretary of State for Defense Policy said that the explosion had occurred on one of the vessels involved in an attempt to recover a nuclear power cruise missile lost in a failed test in 2018. The Russian delegation did not respond to his claim in their presentation. DiNanno expanded on his claim in an interview reported by the Washington Times on October 20th. In that story he is quoted as saying "The explosion was caused by the Skyfall experiencing a criticality accident, an uncontrolled nuclear reaction that released a burst of radiation while Russian personnel retrieved it from the seafloor" . Later in the same story, the Washington Times reports "The blast was set off after the fuel in the missile reactor was no longer cooled by seawater" but it does not attribute this information to DiNanno. Finally, the article states, directly quoting DiNanno, "The blast was measured to be 2.4 magnitude on the seismic scale, he said" (the energy released by an earthquake of this magnitude is equivalent to the explosion of 107 kg of TNT). It is not immediately obvious to the reader that all of these statements can be reconciled.

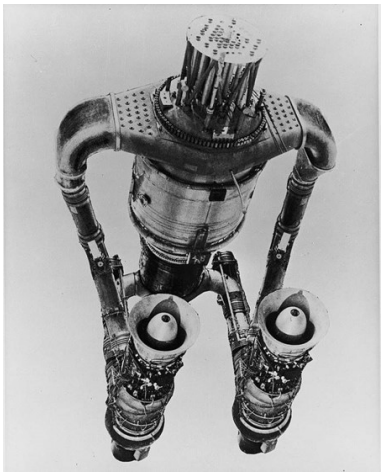
A 'Criticality Accident' is an uncontrolled and unintended chain reaction during which nuclear fission releases heat, neutrons and gamma radiation. There have been close to 100 criticality accidents reported since 1944, and many of them did result in fatalities, but the effects are localized and there is no explosive release of energy so they cannot be detected by a seismometer. Year-old nuclear fuel produces significant heat due to radioactive decay so loss of cooling, by seawater for example, could cause the fuel to melt, but this, by itself, would not produce an explosion and aged fuel would not release short-lived fission progeny detected by the CBTO monitor but a criticality accident would produce these isotopes. Despite these inconsistencies it does appears that most western analysts now agree that an explosion did occur during the attempted recovery of a 9M730 Burevestnik ('Petrel') nuclear powered cruise missile, designated as the SSM-9 'Skyfall' by NATO, lost during a test flight over the White Sea in the summer of 2018.

The core of a nuclear reactor (without its biological shielding) can be surprisingly small, and several countries have investigated the use of nuclear power for aircrafts on and off since 1947. In the 1950s the US Air Force conducted a series of 47 test flights with a B-36 bomber carrying an operating nuclear reactor. Two types of aircraft engines have been considered: the nuclear turbojet and the nuclear ramjet.

A nuclear turbojet replaces the combustion chamber in a standard turbojet with a heat exchanger that transfers heat from the reactor coolant to the compressed air in the heart of the turbojet. The USAF worked on developing nuclear turbojets for 14 years and ground tested a nuclear turbojet before the project was cancelled in 1961 due to cost. Prior to the project shutdown, the HTRE-3, a prototype of one of the reactor designs being evaluated for a nuclear turbojet, suffered a criticality accident on 31 October 1956. There were no fatalities in this accident.

A nuclear ramjet does away with both the compressor and the combustion chamber of a standard turbojet. The forward motion of the aircraft drives air into a scoop that is shaped to passively compress the air. The compressed air flows through the reactor core where it is heated so that it expands before being expelled through the jet nozzle to drive the missile forward. The nuclear ramjet is a much smaller and simpler engine than the nuclear turbojet but its minimal shielding means that it is only suitable for use on unmanned aircraft like cruise cv0063 missiles. Another problem is that the aircraft must be travelling fast enough for the air scoop to function, so it must be launched by a conventional rocket. Most descriptions of the Skyfall cruise missile say that it is launched by a solid fuel rocket that is jettisoned after launch.

An obvious concern is the fate of the reactor in the event of a crash. Most countries have abandoned all work on flying reactors but Russia is the exception. The Russian nuclear program doesn't have a very good safety record even under the best of circumstances (I described another recent accident in my last column) and the present state of the Russian economy doesn't give much reason to be optimistic about the future. Consequently, the prospect of poorly designed and built nuclear reactors flying around the world for long periods of time is grounds for concern.



Heat Transfer Reactor Experiment-3. A nuclear powered jet engine developed as part of the Aircraft Nuclear Propulsion program.
From: Proving the Principle by Stacy, Susan M., U.S. Department of Energy, Idaho Operations Office. ISBN 0-16-059185-6, chapter 13. Available from inl.gov.

1. http://thebarentsobserver.com/en/security/2019/08/isotopes-composition-proves-reactor-was-involved-nenoksa-accident-expert-says
2. http://www.washingtontimes.com/news/2019/oct/20/skyfall-nuclear-cruise-missile-explosion-covered-r/

VENT 2021

Glenn Wood CIH, ROH

In preparation for the ***13th International Conference on Industrial Ventilation (VENT 2021)***, which is currently in planning and is to be held in Toronto August 15 – 18, 2021, a scientific committee has been formed to establish and eventually oversee the technical program. The local contact for this committee is Dr. Howard Goodfellow, Department of Chemical Engineering and Applied Chemistry, University of Toronto. The conference is being sponsored and organized by ASHRAE and a degree of support is being requested from OHAO. This conference started in 1985 in Toronto and has been held every 3 years since. OHAO provided support for the initial conference back in 1985, and the organizers hope that OHAO will be able to "support" and to help to promote this global conference in 2021.

For the inaugural conference support from or by OHAO was $1000 seed money which was matched or augmented by $1000 from U of T. For VENT 2021, ASHRAE is to be the lead organizer and financial support from OHAO is not anticipated to be required.

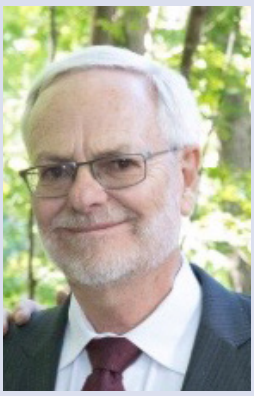
The conference, as currently being planned, will be a topical conference organized by local and national ASHRAE with support to the VENT 2021 Scientific Committee from the ACGIH Industrial Ventilation Committee. The role for OHAO is anticipated to be as an Endorsing Sponsor with possible support in marketing and promoting the conference as a whole, scientific committee participation, seeking and providing/submitting technical papers, providing chair persons, etc. and possibly a booth to promote OHAO.

Dr. Goodfellow will keep OHAO informed on discussions with ASHRAE at both the national and local chapter level. It is a good opportunity for collaboration between the different professional organizations. For further description of the conference see the link below. Stay tuned.

https://www.ashrae.org/conferences/topical-conferences/ventilation-2021

In Memory of Tim Kelsall

Alberto Behar



It is with deep sadness that I would like to share the news that our dear friend and colleague Tim Kelsall is gone after fighting cancer for almost a year.

A well known OHAO member, former Director and Forum's Noisy News Editor, he was well known as an acoustician and hearing conservationist. He was also frequent speaker at OHAO meetings and courses.

Tim did both his Bachelor and Masters at the University of Toronto. He has a Bachelor of Science in Physics, and his Masters is in Aeroacoustics Engineering.

After working for a few years at the Ministry of the Environment, he had a distinguished 42 year career with Hatch, as the Director of Noise and Vibration. There, he carried out noise consulting for industry, energy, and infrastructure clients. He participated in numerous organizations, including CSA, where he served on several standards committees. He did so, similarly, as a member of ISO, the International Standard Organization.

In his spare time, he liked to sail, ski, read, and visit the family cottage. Most of all he loved to spend time with his family.

We will sadly miss Tim as a dear friend and exceptional acoustician!

Nanotechnologies and CSA-Z12885-12

Wagish Yajaman CIH, CRSP

As occupational hygienists, we hear of nanomaterials as they start to appear in consumer products and industrial applications. The number of new nanomaterials developed on a weekly basis along with new formulations and products is mind boggling. There are paints for cars that heal themselves after getting scratched. Window coatings that allow infrared in the cold winter months to heat your parked car have the same material, that in warmer summer months, blocks out the infrared spectrum and keeps your car cool. There are sun screens and cosmetics that blend so well that they are not visible or reflect light to reduce wrinkles, medications that target areas of the body and release the active ingredient, and even nano drills that can be manipulated to function remotely. These are just a few examples of what these materials can do for us.

That's the fun and interesting part. However, the health implications and the toxicology of these materials are not as well understood. In the absence of this data, the Canadian Standards Association (operating as CSA Group) and the International Organization for Standardization (ISO) have been proactively developing guidelines in the area of health and safety of engineered nanomaterials. The CSA S369 Nanotechnologies OHS Technical Committee in particular has been working to bring standards into Canada to provide guidance and direction to employers and safety professionals = that will help protect employee health.

The CSA fact sheet titled CSA-Z12885-12 Nanotechnologies-Exposure Control Program for Engineered Nanomaterials in Occupational Settings offers some valuable information and guidance that you should know.

First, nanotechnology is a multidisciplinary grouping of materials, applications and concepts, physical, chemical, biological, engineering, and electronic processes. The defi¬ning characteristic is size: nanotechnology involves developing and using materials typically in the range of 1 to 100 nanometers (one nanometer is one billionth of a meter).

Second, the potential application of nanomaterials seems to be limitless. Unique properties exhibited at the nanoscale are being applied in a range of product areas including computers, healthcare, packaging, textiles, and energy. However, the use of engineered nanomaterials as primary and intermediate components in manufactured products may raise worker and workplace safety concerns.

The current edition of CSA Z12885 contains valuable knowledge on occupational safety and health practices related to nanotechnologies. The ¬first in a series of standards being adopted into Canada related to the use of nanotechnologies in new processes, products and systems, CSA Z12885 is an adoption, with Canadian deviations, of ISO Technical Report 12885 — Nanotechnologies — Health and Safety Practices in Occupational Settings Relevant to Nanotechnologies.

CSA Z12885 is aligned with the Plan-Do-Check-Act (PDCA) continuous improvement model as found in occupational health and safety management systems (OHSMS) such as the CAN/CSA-Z1000 standard on Occupational Health and Safety Management.

The document also:

- clearly outlines responsibilities and accountability of senior management and encourages worker participation;
- describes elements of hazard identification and risk assessment processes;
- reviews preventative and protective measures;
- outlines proper work procedures and sufficient training needs; and
- includes comprehensive tables, graphs and illustrations.

CSA Z12885 provides workplace safety guidance to manufacturers, material processers, researchers, laboratories, and others in the use of nanomaterials, by supplementing recognized approaches to risk management with a focus on information and issues specific to nanotechnologies.

This guidance will help users to:

- understand potential hazards associated with nanomaterials;
- engage in risk assessment procedures and implement preventative and protective measures;
- improve health and safety within their workplaces;
- increase worker engagement through participation in injury and illness prevention strategies; and
- assess and determine appropriate training requirements and integrate into existing processes.

Other CSA Group standards that you may be interested in include:

Z13329 Nanomaterials - Preparation of safety data sheets (SDSs)

Z12901-2 Nanotechnologies-Occupational risk management applied to engineered nanomaterials – Part 2: Use of the control banding approach

ISO 13121 Nanotechnologies - Nanomaterial risk evaluation

Your Board At Work

OHAO has been busy this year reaching out to students, new and existing members, and other like-minded organizations. Below is a summary of some of the good work being done by OHAO.

- An outreach project is underway between OHAO and three Ontario universities with the goal of introducing students to the field of occupational hygiene and to OHAO.
- OHAO Launched its first webinar in Nov 2019. Looking forward to posting additional material in 2020. Visit the website for details.
- Registration is underway for Spring Symposium/ AGM and PDC.
- The mentorship program is looking for new mentors to meet mentee demand.
- The Public consultations committee has responded to the EACO DSS Draft Guidelines based on member input.

WSPS's Occupational Health & Safety Legislation Tracker

WSPS's Occupational Health & Safety Legislation Tracker is an easy-to-use tool, available at no cost to users, and is a source to keep you informed of legislative changes as they happen, what they mean for your firm, and how they affect your health and safety responsibilities.

The tracker enables users to receive information about new bills, amendments and consultations. Use the tracker http://www.wsps.ca/Information-Resources/Legislation/Home to search in these three ways:

1. Click on one of the popular pieces of legislation shown in the revolving carousel to find out more. For example, "OHS Set Fines Increase" connects you to recent amendments to the Provincial Offences Act. that came into effect on April 4, 2018.

2. Type a keyword into the search engine. For example, "harassment" links you to information about Bill 192, Speaking Out about Workplace Violence and Workplace Harassment Act, 2017.

3. Search by jurisdiction (Ontario, federal, or both) and status (first reading, Royal Assent...). A list of relevant legislation will appear. Just click on the one you are interested in.

OHAO Spring Symposium 2020

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The spring symposium this year was different than other years. In the wake of COVID19, it was difficult for all interested members to attend the symposium/PDC. For those able to attend, it was a great series of presentations with a wide variety of topics.

After the President's Welcome from Jeff Mellany, there was a very informative presentation by Erin Kenneally of EACO. She presented the new guidance document from EACO on conducting designated substance surveys. The purpose of this document was to bridge the gap between legislation/regulation, best practices, and industry. It is meant to provide consistency in industry practice, provide clarification for building owners and their responsibility, and provide protection for workers. It has a wide range of usability for groups such as building/property owners, as well as abatement, construction, and demolition industries. The guidance document provides procedure for common scenarios only and is not suitable for all applications. Having said that, the procedures have no exemptions (e.g. time of build, etc.) and comply with various acts and regulations. Erin shared the details of the EACO designated substance survey guidance document in her presentation. She has graciously shared her presentation with the OHAO membership.

The next topic was "Exposure Matters in Hazard Assessment: Examples from the IARC Monographs" which was presented by Amy Hall. This was a unique opportunity for the attendees to receive some insights into the operation of IARC. IARC is an international collaboration of volunteers that work towards the classification of agents, based on degrees of carcinogenicity. IARC monographs evaluate chemicals, complex mixtures, occupational exposures, physical and biological agents, and personal habits. They provide information of known or suspected carcinogens, which can be used as support for actions (by government, regulatory bodies, etc.) to prevent the occurrence of cancer. Amy shared two IARC monograph examples with us: Welding and Shift Work. Shift work was first evaluated 12 years ago and was recently re-evaluated. The monograph with be available in the next few months. Monographs typically take one year to complete. The public is always invited to suggest agents to be assessed. Amy has kindly shared her presentation with the OHAO membership. After the morning break, Rob Read provided an overview of the new 2019 E2 regulations. There are currently 249 substance listed in Schedule 1 (33 were added in 2019). Rob discussed the regulations, as well as what is required in an E2 plan. The presentation was very informative and we appreciate Rob sharing his presentation with the OHAO membership.

The final morning topic was the Canadian Society of Safety Engineering (CSSE) and the Global Sustainability Initiative, presented by Peter Strum. Peter shared that both lost-time injuries and fatalities have been increasing in the recent years (data available from 2015 to 2018). He discussed the recent movement from compliance to management systems and sustainability. Peter gave us a lot to think about. His presentation is also kindly shared with the membership.

The afternoon sessions began with Warren Clements and Jessica Barua, who presented "Ontario Designated Substances Assessment – Practical Guidance". Warren provided an overview of various designated substances and examples of materials that include them. Jessica guided us through their workbook for designated substance assessments. The workbook contains 3 major sections; application, assessment, and conclusions. The presentation was very practical and a good introduction to how to go about conducting a designated substance assessment.

The final presentation was about CSA Standards Updates, by Dave Shanahan. CSA research, as well as updates to the following standards were covered:

CSA Z94.4 Selection, Use and Care of Respirators
CSA Z180.1 Compressed Breathing Air and Systems
CSA Z316.5 Fume Hoods and Associated Exhaust Systems (to be released in August 2020)
CSA Z460 Control of Hazardous Energy
CSA Z1008 – New Standard on Management of Work Impairment (draft available for public review on May 2020, scheduled for release in January 2021)

The updates were detailed and very informative. The standards can be purchased through the CSA at https://store.csagroup.org/

Overall, it was a very successful Spring Symposium, despite the reduced number of attendees. The topics covered were very interesting and informative. Due to the ever-growing concerns about COVID-19, a small workgroup of the attendees convened after the closing of the symposium. The OHAO statement concerning COVID-19 that is on the website and included in communications came out of that meeting:

OHAO is concerned about the spread of the COVID 19 virus. We encourage Ontario employers to monitor and implement the controls outlined by public health authorities to reduce the spread of this virus in Ontario workplaces.

For hygienists providing guidance to their employers or clients, we recommend relying on credible sources of information to make professional judgments such as those posted on the Infection and Prevention Control Canada (IPAC Canada) website https://ipac-canada.org/.

OHAO Spring PDC 2020

Rhiannon Filip ROH, CIH, CRSP

Avoiding IAQ Problems & V in HVAC: What, Why, Where, How and How Much

As Occupational Hygienists, we are often called upon to recognize, evaluate and control the hazards related to indoor air quality and may be asked to contribute to or assess building ventilation systems.

This spring OHAO hosted two half-day sessions on Wednesday, March 11, 2020: V in HVAC: What, Why, Where, How and How Much Avoiding IAQ Problems

These courses were presented by Hoy R. Bohanon, P.E., a past chair of SSPC 62.1 Ventilation of Acceptable Indoor Air Quality, a member of ASHRAE's Environmental Health Committee, ASHRAE 62.2 Ventilation and Acceptable Indoor Air Quality in Residential Buildings and an ASHRAE Distinguished Lecturer. Forty-four OHAO members participated in the PDC's following appropriate social distancing measures which had been implemented for the event.

The V in HVAC session started with a review of fundamental IAQ principals and ASHRAE Standard 62.1-2019 with emphasis on the changes in the latest update.

Avoiding IAQ Problems introduced a free downloadable IAQ Guide available from www.ashrae.org: Indoor Air Quality Guide: Best Practices for Design, Construction, and Commissioning. The guide was developed to clarify design and construction strategies to improve IAQ relative to current practice and minimum codes and standards, provide a comprehensive, practical resource for building professionals on achieving good IAQ, and provide a rational framework for evaluation of IAQ.

Participants gained an understanding of common causes of IAQ problems in buildings, how to limit moisture and mould in buildings, identifying types of outdoor and indoor contaminants and control measures, recognizing how design and installation details can lead to unexpected IAQ problems in HVAC systems, an ability to assess the accuracy and applicability of various outdoor air monitoring and control methods, and knowing how to apply filtration and gas-phase air cleaning to address specific contaminant sources.

Participants left with excellent information, tools, and resources to evaluate and improve their own professional performance.

On behalf of OHAO, Thank you Hoy Bohanon for your interesting and informative sessions.