SAIOH news

As part of our service to members, in this newsletter we provide feedback on the latest developments within the Southern African Institute for Occupational Hygiene (SAIOH). SAIOH exists for its members and is reliant on them to continue to serve this noble profession ethically. Therefore, we invite your inputs and feedback on any matters communicated below.

SAIOH PRESIDENT'S ADDRESS

Naadiya Mundy: SAIOH President
e-mail: president@saioh.co.za

Naadiya Mundy
Photograph: courtesy of SAIOH

We are living in truly extraordinary times and 2024 will, I am sure, be no different. I would like to take this opportunity of welcoming you into the new year and reminding you that we are where we are because of you – thank you.

Exhaling clarity on electronic nicotine delivery systems (ENDS): considering occupational hygiene management in our daily lives

Occupational hygiene, which is an essential discipline within the broader field of occupational health and safety, is committed to managing and mitigating workplace hazards to protect the wellbeing of employees. It involves a systematic approach to identifying, assessing, and controlling various activities that may pose risks and hazards to workers' health. One prevailing concern, demanding attention within the realm of occupational hygiene, is the use of electronic nicotine delivery systems (ENDS), commonly known as e-cigarettes or vaping devices. Traditional combustible tobacco cigarettes present substantial risks to human health, extensively documented and comprehensively understood, with many of these health effects manifesting only after prolonged cigarette smoking over decades.

Direct scientific comparisons with combustible tobacco cigarettes are challenging, regarding most health effects.[1] Electronic nicotine delivery systems employ a battery-powered heating element to vaporise a liquid solution, often containing nicotine.[1] Housed within metal or plastic tubes, these devices incorporate a cartridge filled with liquid (typically propylene glycol, vegetable glycerine, flavourings, nicotine, humectants and, in some instances, metals),[2] which, upon heating, produces an aerosol. Users inhale this aerosol by drawing on the device, akin to the action of smoking a conventional tobacco cigarette, subsequently exhaling the aerosol into the surrounding environment. As ENDS have gained popularity as an alternative to traditional tobacco products, their presence in workplaces introduces new challenges for occupational hygiene practitioners. The evolving landscape of nicotine consumption, coupled with the potential health impacts of ENDS aerosols, demands a nuanced discussion within the framework of occupational hygiene.

The National Institute for Occupational Safety and Health (NIOSH) in the United States of America (USA) recommends that employers *"establish and maintain smoke-free workplaces that protect those in workplaces from involuntary, second-hand exposures to tobacco smoke and airborne emissions from e-cigarettes and other electronic nicotine delivery systems".*[3] The World Health Organization (WHO) advises against the indoor use of electronic smoking devices (ESDs), particularly in smoke-free settings.[4] These recommendations aim to reduce the potential risk, for bystanders, of inhaling the aerosols emitted by these devices, and to uphold the effectiveness of smoke-free regulations. The issue of aerosol exposure is a significant concern for environmental health, primarily due to the particles' ability to deeply infiltrate the respiratory system and cell membranes.[5] They have the potential to translocate from the airways into the bloodstream[6] and deposit in various organs, including the brain, carrying with them condensed toxic compounds.[7] The quality of indoor air is a critical concern for human health, as individuals typically spend much of their time indoors where particle concentrations are often elevated.[8]

Nicotine contributes to central and peripheral nervous system effects and causes dependence and addiction; *"exposure to nicotine from e-cigarettes likely elevates cardiovascular disease risk in people with pre-existing cardiovascular disease(s)".*[1]

There has been limited research on the health effects of ENDS aerosols; however, some contain heavy metals such as lead (Pb), nickel (Ni), and chromium (Cr), which occur from the contamination of e-liquids or leaching from elements of ENDS devices.[9] The discovery of potentially harmful metals in e-liquids raises concerns as these metals have the capacity to transfer to the aerosol and be inhaled. Lead, Cr, copper and Ni have adverse effects on human health even at low levels of exposure. Lead is a toxicant that can contribute to neurological damage, particularly in developing brains; high levels of Ni and Cr are linked to short-term health effects such as decreased lung function, bronchitis, and asthma, and long-term risks of cancer.[9-11]

The integration of occupational hygiene with ENDS presents a challenge in maintaining workplace health and safety standards. As ENDS continue to reshape the landscape of nicotine consumption, it is evident that a comprehensive approach within the framework of occupational hygiene is essential to safeguard the wellbeing of the workforce. The chemical complexity of ENDS aerosols demands a thorough understanding of their composition and potential health effects. Occupational hygiene practitioners play a crucial role in assessing, monitoring, and controlling these exposures to effectively mitigate risks. Ventilation systems and engineering controls are critical in the arsenal of occupational hygiene strategies. Effectively managing the dispersion of ENDS aerosols, through well-designed ventilation systems, contributes significantly to maintaining

a healthy indoor air quality. Moreover, the implementation of clear workplace policies, supported by robust education and training programmes, is paramount in fostering worker awareness and ensuring compliance with safety guidelines.

REFERENCES

1. National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice; Committee on the Review of the Health Effects of Electronic Nicotine Delivery Systems. Public Health Consequences of E-Cigarettes. Eaton DL, Kwan LY, Stratton K, editors. Washington, (D.C.): National Academies Press (US); 2018 January 23. doi: 10.17226/24952.
2. Neu HM, Lee A, Brandis JEP, Patel V, Schneider A, Kane MA, et al. Cigalike electronic nicotine delivery systems e-liquids contain variable levels of metals. Sci Rep. 2020; 10(1):11907. doi: 10.1038/s41598-020-67789-7.
3. Castellan RM, Chosewood C, Trout D, Wagner GR, Caruao CC, Mazurek J, et al. Promoting health and preventing disease and injury through workplace tobacco policies. Current Intelligence Bulletin 67. National Institute for Occupational Safety and Health (NIOSH) Publication No. 2015-113. Morgantown, WV: NIOSH; 2015. Available from: https://www.cdc.gov/niosh/docs/2015-113/pdfs/fy15_cib-67_2015-113_v3.pdf (accessed 26 February 2024).
4. World Health Organization Framework Convention on Tobacco Control. Electronic nicotine delivery systems. Document FCTC/COP/6/10. Geneva: WHO; 2014 July 21. Available from: https://apps.who.int/gb/fctc/PDF/cop6/FCTC_COP6_10-en.pdf (accessed 26 February 2024).
5. Schins RPF, Lightbody JH, Borm PJA, Shi T, Donaldson K, Stone V. Inflammatory effects of coarse and fine particulate matter in relation to chemical and biological constituents. Toxicol Appl Pharmacol. 2004; 195(1):1-11. doi: 10.1016/j.taap.2003.10.002.
6. Fuoco FC, Buonanno G, Stabile L, Vigo P. Influential parameters on particle concentration and size distribution in the mainstream of e-cigarettes. Environ Pollut. 2014; 184:523-529. doi: 10.1016/j.envpol.2013.10.010.
7. Brown DM, Wilson MR, MacNee W, Stone V, Donaldson K. Size-dependent proinflammatory effects of ultrafine polystyrene particles: a role for surface area and oxidative stress in the enhanced activity of ultrafines. Toxicol Appl Pharmacol. 2001; 175(3):191-199. doi: 10.1006/taap.2001.9240.
8. Block AC, Schneller LM, Leigh NJ, Heo J, Goniewicz ML, O'Connor RJ. Heavy metals in ENDS: a comparison of open versus closed systems purchased from the USA, England, Canada, and Australia. Tob Control. 2023. doi: 10.1136/tc-2023-057932.
9. Verstraeten SV, Aimo L, Oteiza PI. Aluminium and lead: molecular mechanisms of brain toxicity. Arch Toxicol. 2008; 82(11):789-802. doi: 10.1007/s00204-008-0345-3.
10. Bellinger DC, Stiles KM, Needleman HL. Low-level lead exposure, intelligence and academic achievement: a long-term follow-up study. Pediatrics. 1992; 90(6):855-861.
11. Petrosino V, Motta G, Tenore G, Coletta M, Guariglia A, Testa D. The role of heavy metals and polychlorinated biphenyls (PCBs) in the oncogenesis of head and neck tumors and thyroid diseases: a pilot study. Biometals. 2018; 31(2):285-295. doi: 10.1007/s10534-018-0091-9.

NATIONAL COUNCIL FEEDBACK

Naadiya Mundy: SAIOH President
e-mail: president@saioh.co.za
Deon Jansen van Vuuren: SAIOH General Manager
e-mail: deon.jvvuuren@gmail.com

Membership fees

SAIOH is aware that, in the current economic climate, many of our members find it difficult to renew their memberships and, in our bid to proactively respond to this, we found it hard to justify a substantial increase in professional membership fees. Your membership and participation are what builds SAIOH, and we have, therefore, increased the 2024 membership fees by only 3%. We call on all our members to timeously renew their memberships, upload their CPD points, and participate in our exciting plans for 2024.

Strategic plan

The SAIOH strategy for 2023–2027 was circulated to all SAIOH members in October 2023, after being launched at the SAIOH annual general meeting. The SAIOH Council is meeting in May to ensure that targets are being met and to explore further strategic developments for the Institute and its members.

Ethics

SAIOH's memorandum of incorporation (MoI) has been concluded by the legal team and submitted to members for their information. SAIOH's legal advisors will soon begin the task of reviewing the SAIOH ethics policy and procedure(s), enabling the Ethics Committee to start its work in earnest. The ethics plan forms an important part of the SAIOH strategy (strategy #3).

Please note

As from 1 January 2023, all SAIOH-certified members are required to provide proof that they have completed an acceptable occupational hygiene ethics training course.

SAIOH branch activities

The Gauteng branch hosted its third meeting on 4 August 2023 at the National Institute for Occupational Health (NIOH) offices in Johannesburg. Prof. Anja Franken (from North-West University) discussed 'Invitro permeation of platinum group elements.' On 1 December, the branch held its last meeting for 2023, online, during which a call was made for nominations for new Gauteng branch committee members.

The Mpumalanga branch hosted its second meeting on 11 August 2023 at Seritiza Coal in Middelburg. Two presentations were made by personal protective equipment (PPE) providers and one by Trysome, regarding the new technology to control indoor air quality (IAQ) in heavy-duty mining vehicle cabs. On 24 November, the branch held its third and final meeting of 2023, at Exxaro Matla. This was a hybrid event.

The KwaZulu-Natal branch hosted its second hybrid meeting on 31 August 2023. Prof. Jérôme Lavoué (University of Montreal, Canada) presented on industrial hygiene statistics and the use of ExpoStat in occupational hygiene.

The Western Cape branch hosted a hybrid meeting on 15 September 2023. Tobias van Reenen (Council for Scientific and Industrial Research (CSIR)) presented the new building regulations draft, SANS 10400-0, covering indoor ventilation.

The final Western Cape branch meeting took place on 17 November 2023, in person, and was followed by an election of the new branch committee members and a lawn bowls social competition.

IOHA and OHTA feedback

Deon Jansen van Vuuren, in his role as SAIOHs interim caretaker, attended three online International Occupational Hygiene Association (IOHA) National Accreditation Recognition Committee (NARC) meetings on 17 August, 19 October, and 7 December 2023.

The IOHA Board of Directors held its autumn meeting in Cape Town, hosted by SAIOH, on 22 October 2023. This coincided with the SAIOH 2023 Conference. SAIOH and the Professional Certification Committee (PCC) were represented by Corlia Peens (PCC Chairperson), as an observer, and Deon Jansen van Vuuren.

SAIOH also hosted a formal dinner for the IOHA Board Directors and SAIOH Council on 23 October 2023 at the African Gold Restaurant. It was a huge success and enjoyed by everybody.

SAIOH Technical Committee feedback

The SAIOH Technical Committee's research on 'Welding fumes, the measurement and the analyses thereof' is in limbo. To help kick-start this research, the Occupational Hygiene Approved Inspection Authorities (OH AIA) Association co-hosted an interactive session at the SAIOH mini-conference on 31 July 2023, at the CSIR's International Conference Centre (ICC). The session was coordinated and chaired by Mr Lloyd Askham, who discussed welding fume measurements, sampling media and, specifically, the use of the Institute of Medicine (IoM) samplers. To keep the momentum going, a sub-committee will be formed by SAIOH and the OH AIA Association to develop a position paper on its research.

SAIOH's second Technical Committee started developing technical procedures and a SAIOH position paper on heat stress management. This Committee will continue doing research on heat stress with a focus on developing a technical paper and enabling SAIOH to provide comprehensive and relevant proposals to strengthen the newly launched Physical Agents Regulations (PAR) – the 'old' Environmental Regulations for Workplaces.

The Council Technical Co-ordinator, Wessel van Wyk, is finalising a position paper on real-time monitoring. As soon as this is approved by the SAIOH PCC Executive Committee's sub-committee, it will be circulated to all SAIOH members and stakeholders.

Dr Ivan Niranjan (SAIOH PCC Vice-Chair) was co-opted to preside over a more active Technical Committee, commencing with peer reviewing of heat stress and real-time monitoring. Research emanating from this Committee will be shared in future communications.

SAIOH Annual Scientific Conference

The hybrid SAIOH 2023 Annual Scientific Conference, with close to 600 attendees, took place from 23 to 26 October 2023, and was extremely successful. The Botswana Association of Occupational Hygiene (BAOH) will host the 2024 SAIOH Annual Scientific Conference in Gaborone, Botswana. The Conference Committee has already had several meetings as it begins its preparations for the conference.

Image: courtesy of SAIOH

Communications

SAIOH continues to communicate daily with its members and stakeholders, using various platforms.

FROM THE PROFESSIONAL CERTIFICATION COMMITTEE (PCC)

Lee Doolan: SAIOH PCC Administrator
e-mail: lee@saioh.co.za
Deon Jansen van Vuuren: SAIOH General Manager
e-mail: deon.jvvuuren@gmail.com
Corlia Peens: PCC Chairperson
e-mail: corlia.peens@sasol.com

Certification assessments

A summary of results for 2023 assessments is provided in Table 1. Assessment dates for 2024 are provided in Table 2.

PCC assessment improvements

The PCC technical teams continue to revise the PCC oral assessment format and questions in line with the occupational hygiene self-assessment tool. Sixteen of the 17 OH modules are already completed.

Two PCC technical teams are working in parallel. The first is updating the SAIOH self-assessment tool and revising the PCC oral assessment format, and the second is developing questions and the required answers. Improvements in the assessment format will ensure that the growing field of occupational hygiene is covered, and that the assessment format and tools still are relevant and current.

The PCC Chief Examiner is busy improving the application and written format.

Occupational Hygiene Skills Forum (OHSF)

The OHSF took part in the first OHTA Approved Training Provider forum meeting in August 2023. The second meeting took place on 31 January 2024.

Table 1. SAIOH PCC certification assessment results, 2023

	Written assessments				Oral assessments			
Certification category	**Assessed**	**Passed**	**Failed**	**Pass rate**	**Assessed**	**Passed**	**Failed**	**Pass rate**
	n	**n**	**n**	**%**	**n**	**n**	**n**	**%**
OH assistant	203	183	20	90.1	203	183	20	90.1
OH technologist	69	42	27	60.9	52	27	25	51.9
Occupational hygienist	48	29	19	60.4	40	28	12	70.0
Total	**320**	**254**	**66**	**79.4**	**295**	**238**	**57**	**80.7**

Table 2. SAIOH PCC registration and assessment dates,2024

Assessment type	Application closing date	Payment deadline	Assessment date
Written	12 January	16 February	15 March
Oral	12–19 April		
Written	26 April	31 May	28 June
Oral	26 July–2 August		
Written	2 August	6 September	4 October
Oral	15–22 November		
Written assessments (universities)			November/December

The OHTA W201 Multiple-Choice Question (MCQ) Consortium, comprising SAIOH, Workplace Health Without Borders (WHWB), the American Industrial Hygiene Association (AIHA), and the Australian Institute of Occupational Hygienists (AIOH) met in September 2023. This working committee developed and verified MCQs, which were placed in a database that will be accessible to all assessment paper developers to use in the 201OHTA papers and, in SAIOH's case, also for the occupational hygiene assistant papers.

Another function of the OHSF is to evaluate applications from tertiary institutions for recognition of their occupational hygiene-related qualifications. The OHSF is progressing well with these accreditations, and is currently evaluating the Cape Peninsula University of Technology's (CPUT) occupational health qualification. All tertiary institutions that offer occupational hygiene qualifications are encouraged to contact the PCC administrator for information regarding application for recognition: lee@saioh.co.za.