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ACGIH COVID-19 White Papers Update and New *Bioaerosols Air Sampling Instrumentation* Monograph

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Jack Springston, CIH, CSP, FAIHA

This week we welcomed Jack Springston, CIH, CSP, FAIHA - ACGIH Bioaerosols Committee Vice Chair, Neil Zimmerman, PhD, PE, CIH, FAIHA - ACGIH Industrial Ventilation Committee Member and Frank Mortl III, CAE - ACGIH Executive Director to IAQradio for an update on ACGIH COVID documents and the new Bioaerosols Monograph on Air Sampling Instrumentation. ACGIH's Bioaerosol Committee has developed a COVID white paper and as well ACGIH's Industrial Ventilation Committee has collaborated with ASHRAE on its most recent COVID white paper revisions. The Bioaerosol Committee also is in the midst of revising the 1999 Bioaerosols Assessment and Control book. The industry is anxiously awaiting this revision.

Guest Bios:

As Executive Director, Mortl is responsible for providing guidance and support to the Board of Directors while leading ACGIH®'s team of professionals who are committed to serving a membership that strives to deliver critically important industrial hygiene knowledge along a wide spectrum of topics ranging from air sampling instruments, bioaerosols, biological exposure indices, industrial ventilation, as well as threshold limit values (TLVs®) for chemical substances and physical agents.

Neil Zimmerman, PhD, PE, CIH, FAIHA is a Professor Emeritus of Industrial Hygiene, retired after a 32 year career (1981-2013) as a professor, researcher and educator in the Industrial Hygiene Program of the School of Health Sciences, Purdue University. Dr. Zimmerman is an active member of the AIHA's Academic

Accreditation Committee, which is responsible for ABET accreditation of university IH programs and is a past Chair. He currently is an active member of the ACGIH Industrial Ventilation Committee and was also an active participant in the development of ACGIH's recently released "ventilation for COVID-19" white papers. Dr. Zimmerman holds a BS in Mechanical Engineering from Northwestern University, and MS in Environmental Engineering and PhD in Air and Industrial Hygiene from the University of North Carolina, Chapel Hill. He is certified in the comprehensive practice of industrial hygiene (CIH). He has been affectionately referred to as Dr. Z by his many past students and is also known as "the Z-man"!

Jack Springston, CIH, CSP, FAIHA has over 34 years' experience in industrial hygiene and occupational health. He has been a Certified Industrial Hygienist (CIH) since 1993, and is one of less than 50 active CIHs who also hold a sub-specialty certificate in Indoor Environmental Quality (IEQ). He has also been a Certified Safety Professional since 1999. Jack is currently the Industrial Hygiene Services Manager, Branch Safety Officer, and Training Director for Atlas Technical in New York City, Albany, and Long Island.

Jack received a BS Degree in Environmental Biology from LIU/Southampton College and a MS Degree in Environmental and Occupational Health Sciences from Hunter College. He is a Fellow of the American Industrial Hygiene Association (AIHA) and past-Chair of AIHA's Indoor Environmental Quality, Biosafety & Environmental Microbiology, and Continuing Education committees. Jack currently serves as the Vice Chair of the American Conference of Governmental Industrial Hygienists' (ACGIH) newly reformed Bioaerosols Committee and has authored and co-authored several chapters for the upcoming 2nd Edition Bioaerosols Assessment and Control book.

Nuggets mined from this week's episode:

Frank Mortl –

- ACGIH is very busy creating publications, white papers, Bioaerosol Monographs, and educational courses.
- ACGIH is actively sharing its expertise with other organizations
- ACGIH is proactively reaching out and offering a free membership and free copy of TLV book to any fulltime college student studying occupation safety and health.

Jack Springston-

- Jack is employed by Atlas Technical in NYC.
- Atlas has 140 offices and employs 3500 people.
- Atlas is finding it challenging to recruit good qualified people.

Neil Zimmerman-

- Purdue's IH program continues to do well.
- IH program alumni examples: currently acting head OSHA and EHS leadership positions at NASA, Homeland Security, Disney World, etc.
- As an IH it's a great feeling knowing that you go to work each day and protect lives and health. Going to work is the 8th leading cause of death in the US. There is a work-related death due to a workplace injury every 99 minutes. In the US there are more than 50,000 deaths annually due to long term work related illnesses, translating into a death every 10 minutes.
- COVID has changed thinking about ventilation in industrial settings. Jonathan Hale coined the term "low and slow" ventilation as a displacement ventilation mechanism against the spread of COVID indoors.
- The CDC and WHO were very slow to accept the evidence that COVID was spread by aerosols in addition to fomites and spittle droplets .
- Traditionally ventilation people recommended HVAC systems designed for human comfort (e.g. control: temperature, RH and odors). Industrial ventilation approach is to control and remove trace toxic contaminants using local exhaust or general exhaust (including laminar flow). The paradigm shift is that now occupants are the source of high toxicity COVID. The new strategy is to use general exhaust with displacement low and slow near the ground, allowing it to rise on the warm air plume created by occupants and equipment where it is removed at the ceiling. Conditioned fresh air is utilized along with upgrade filtration (MERV 13, 14, sometimes 17).

Jack Springston-

- **Question: Is Atlas involved in many HVAC redesign projects in NYC?** No, however we are involved in COVID projects related to the safe occupancy of older buildings some of which lack forced air ventilation. Reconfiguring, retrofitting or replacing HVAC in existing buildings is a huge and costly challenge. There is a need for outside air and exhaust. Pulling in

unconditioned air has consequences. Tactics: Addition of portable HEPA air cleaners. It's not uncommon for forced air systems to have both ceiling mounted: supply and return registers.

Neil Zimmerman-

- Room configuration & Vertical displacement. More fresh air and filtration isn't a silver bullet. Tactics: reduce near field exposures by limiting occupancy, social distancing, masking. New design N95 mask is worn without straps relying on medical grade adhesive. Avoid horizontal airflows downwind from someone's fan. Run existing exhaust fans (e.g. kitchen, baths, LEV etc.) during occupancy and for a few hours before and after.

Frank Mortl-

- ACGIH's expertise is on full display.
- ACGIH has hundreds of expert volunteers like Jack and Neil.

Neil Zimmerman-

- Real time analysis of COVID virus in air is needed in addition to modeling. We need to sample.
- Smoke, nonpathogenic bacteriophage, computational fluid dynamics can be used to study near and far field transmission.
- Proper maintenance. When schools are under financial pressure, physical plant often gets shortchanged.
- Neil was asked to inspect the roof units on his synagogue and found that 5 out of 8 economizers (i.e. no outside air) were not working.

Jack Springston-

- Much COVID sampling shows as non-detectable and when COVID is detected in a hospital, RNA doesn't reveal if COVID is viable.
- Realtime instrumentation is biowarfare driven (Gulf War). Fluorescent Spectroscopy can determine if its Anthrax or not?
- The monograph still uses old techniques. Researchers are getting better instrumentation (e. g. elastic scattering is like a multidirectional viewing microscope, microfluidic techniques and real-time assay). The new research equipment is very costly and beyond the reach of practitioners.
- Practitioners are not really making progress. Jack has pulled away from Anderson, impinger, Burkhard 7 day impingers. Stan Baxter invented the

spore trap sampler. Samples are easy to collect and analyze. The analysis is questionable. Jokingly, “If you don’t like the results, send the sample to another lab.”

- Jack is merging the monograph and an old book chapter to create a new chapter that will be put in both books. Jack credits Cheri Marcham with keeping book on pace. Thus far 4 chapters are complete, 3-4 more are close to completion. Goal is to turn the completed book over to ACGIH in June of 2022.

Neil Zimmerman-

- **Question- How is Purdue handling COVID?** Neil is a proud “Boilermaker”. Purdue has initiated an extensive approach to dealing with COVID: the “Protect Purdue Program” where everyone takes personal responsibility with the “Protect Purdue Pledge”. Requirements include: masking mandate, proof of vaccination (or agreeing to frequent testing). Instituted contests in which compliant vaccinated students can win scholarship money and employees can win football season tickets. Focus of ventilation upgrades is on high density usage buildings, some even with MERV 17 filters.

Question: What is your opinion on the frequency of HVAC cleaning?

- **Neil Zimmerman-** There is no good recommendation on cleaning frequency. Efforts and expense expended with little or nothing to show for it.
- **Jack Springston-** HVAC disinfecting is a waste of money. Settled dust in ductwork is settled dust, unless the duct is disturbed the dust will remain settled. Cleaning exhaust ducts in kitchens to prevent fires and cleaning to remove soil obstructing airflow makes sense.

ROUNDUP-

- **Neil Zimmerman-** Get vaccinated, get an N95 mask, eat outdoors at restaurants, focus on airflow patterns.
- **Jack Springston-** Covid isn’t over!
- **Frank Mortl-** There are many ventilation experts with ACGIH. ACGIH has excellent courses on: Basics of Industrial Ventilation (On-Demand), Fundamentals in Industrial Ventilation, Advanced Industrial Ventilation, and Computational Fluid Dynamics.

Z-Man signing off

Trivia Question-

In what year did the ACGIH adopt its first list of 148 exposure limits, then referred to as Maximum Allowable Concentrations?

Answer: 1946 Answered by: Phil Rauscher, Port Clinton, Ohio