



1791 Tullie Circle, N.E./Atlanta, GA 30329  
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**DRAFT**

## TC/TG/MTG/TRG MINUTES COVER SHEET

(Minutes of all Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/MTG/TRG No. TC 9.10 DATE April 26, 2023

TC/TG/MTG/TRG TITLE Laboratory Systems

DATE OF MEETING February 7, 2023 LOCATION Atlanta

VOTING MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	CORRESPONDING MEMBERS AND ADDITIONAL ATTENDANCE (INCLUDING VIRTUAL ATTENDEES)
Robert Weidner	2022	Mary Foutz	2019	Roland Charneux (CM)
Christine Reinders-Caron	2019	Lloyd Le	2019	Traci Hanegan (CM)
John Varley	2020			Doug Ross (CM)
Kelley Cramm	2022			Duncan Phillips (CM)
Ken Crooks	2021			Gordon Sharp (CM)
Glenn Friedman	2020			Matt Gaedtke (Guest)
Kishor Khankari	2020			Keith Hammelman (Guest)
Wei Sun (virtual)	2021			George Isherwood (CM)
Lou Hartman (virtual)	2022			Dave Rausch (CM)
Martin Stangl (virtual)	2019			Ben Fuller (CM)
Rachel Romero	2022			Rajendera Kapoor (CM)
Chris Kirchner	2022			Tom Smith (CM)
Charlie Henck	2022			Scott MacMurray (CM)
				Ryan Parker (CM)
				Jason Atkisson (CM)
				Walter George (Guest)
				John Castelvechi (CM)
				Otto Van Geet (Guest)
				Hoy Bohannon (CM)
				Kurt Monteiro (CM)

				Stephen Schoonbaert – (PCM)
				Matthew Lusardi (Guest)
				Michael Amstadt (CM)
				Gregory Marcus Gross (CM)
				Justin Garner (CM)
				Jim Coogan (CM)
				Victor Cincola (CM)
				Brendan Dingman (CM)
				Ken Kuntz (CM)
				Mark Malkin (CM)
				John Neubauer (CM)
				Victor Neuman (CM)
				Gaylon Richardson (CM)
				Ryan Soo (CM)
				Amanda Kirkeby (Guest)
				Bill Stump (CM)
				Duncan Green (PCM)
				Eddie Xue (Guest)
				Ian Li (Guest)
				Walker Jones (Guest)
				Ali Salim Shirazi (PCM)
				William Lin (PCM)
				Christine Benga (PCM)
				Jesse Fisher (Guest)
				Jordan Beardy-Singh (PCM)
				Deni Scar Sobek (Guest)
				Anne Juran (PCM)
				Danny Sanchez (CM)
				Patrick Carpenter (CM)
				Kyle Schumann (Guest)
				Larry Schoen (PCM)
				Mike Carl (PCM)
				Pierre Luc Baril (PCM)
				Brad Cochran (CM)

				Brent Fullerton (CM)
				Eric Ballachey (CM)
				Jacob Edmondson (CM)
				Guy Perrault (CM)
				Kristopher Geyson (PCM)
				Tyler Kee (PCM)
				Brendon Burley (CM)
				Wade Conlan (CM)
				Eric Fontaine (CM)
				Paul Lemestre (CM)
				Chris Malanga (CM)
				Kurt Rindoks (CM)
				Andrew Stout (CM)
				Mitch Swann (CM)
				Ryan Ellis (Guest)
				John Diekmann (Guest)
				Dylan Nev (Guest)
				Dave Vanweerdil (Guest)
				Mo Afshin (Guest)
				Michael Loeppky (Guest)
				Mark Richards (Guest)
				Kin Shifflet (Guest)
				Steven Graves (Guest)
				Joy Cox (Guest)
				Alex Balyeu (Guest)
TAC Section Head: Brad Cochran			SH9@ashrae.net	
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)			See ASHRAE email alias list for needed addresses.	
Mike Vaughn, Manager Of Research & Technical Services			MORTS@ashrae.net	

Note: These draft minutes have not been approved and not the official, approved record until approved by the TC.

## **CALL TO ORDER**

Bob Weidner called the meeting to order at 3:09 PM EST.

## **CODE OF ETHICS COMMITMENT**

*In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, inclusiveness and respect for others, which exemplify our core values of excellence, commitment, integrity, collaboration, volunteerism and diversity, and we shall avoid all real or perceived conflicts of interests.*

(Code of Ethics: <https://www.ashrae.org/about/governance/code-of-ethics>)

(Core Values: <https://www.ashrae.org/about/ashrae-s-core-values>)

## **TITLE, PURPOSE, SCOPE for TC9.10**

Our purpose is focused on laboratories.

*TC 9.10 is concerned with HVAC components for laboratory systems and their use therein. These components include but are not limited to air intakes, supply air conditioning systems, air distribution methods, laboratory fume hoods, biological safety cabinets, exhaust systems and exhaust discharge. The technical committee will address the unique requirements of all types of laboratories. These laboratories include but are not limited to nuclear, pharmaceutical/medical, general chemistry, and teaching. Additional TC 9.10 concerns are; (1) the reduction of energy usage in laboratory systems, (2) the monitoring of government regulations affecting laboratory operation.*

## **SELF INTRODUCTIONS**

Self-introductions were not conducted due to the large number of people in the room and in attendance virtually.

## **WEBSITE**

Jim Coogan reported that the website needs some updating. He asked all members to look at the website and let him know what needs updating.

## **MEMBERSHIP**

Guy took roll call for voting members. Twelve of 15 voting members are present. Quorum achieved. The following voting members will be rolling off June 30, 2023:

- Eric Ballachey
- Mary Foutz
- Christine Reinders-Caron
- Lloyd Le
- Martin Stangl

## **MEETING MINUTES**

Kelley Cramm moved, and Rachel Romero seconded to approve the meeting minutes from the last two meetings. The minutes were approved unanimously.

## **ANNOUNCEMENTS**

Kelley and Gordon were awarded the grade of Fellow.

Wade Conlan is set to be elected a Society Vice President.

Congratulations and a round of energetic applause was given to Kelley, Gordon, and Wade.

## **SECTION HEAD REPORT**

Brad Cochran, Head for Section 9 gave his report. There is a new Task Group, TG9.Space looking at habitats on the moon and mars. They are working on research and programs on the history of habitats on Apollo capsules, etc.

The Task Force on Building Decarbonization is planning to publish 6 publications. The first is now available for free download.

TAC has been discussing how we can expand the reach of our standards internationally. Would like to make them more applicable to international members. Need to understand how many international members (those outside of North America) are participating in TCs. The new TC sign-in sheet includes a column to identify yourself as an international member.

Another idea from the Board of Directors and Tech Council is to form communities inside ASHRAE. The idea would be to encourage working toward common goals. This may be easier for Section 9 than some others since section 9 is a fairly cohesive group. Brad plans to meet with Section 9 TC chairs to facilitate an open discussion and identify commonalities.

You can contact Brad at:

[SH9@ashrae.net](mailto:SH9@ashrae.net)  
[Asktac@ashrae.net](mailto:Asktac@ashrae.net)

### **PROGRAM SUBCOMMITTEE REPORT**

Christin Reinders-Caron provided a report. The committee met Jan. 30<sup>th</sup>. We have one sponsored and one co-sponsored session tomorrow.

Rachel gave a brief summary of the session abstract for Seminar 59. Forum 8 is at 9:45. Kishor is facilitating this session on air change rates. Everyone is encouraged to attend both sessions.

Tampa website is open for proposals. Deadline is February 27<sup>th</sup>. Conference paper timeline has been reduced from 9 months to 6 months.

Tracks and schedule for Chicago are in the minutes (attached). Chicago deadline is August 2<sup>nd</sup>.

Would like to consider a forum on energy savings you think you're getting but you're not. Idea is that a lot of calculations are done to show savings. Many times, the metrics used don't align between calculated and actual savings.

Consider a seminar on filtration and effectiveness. Particularly on room air cleaner effectiveness given various configurations and locations. Could co-sponsor this with another TC.

Design/Build vs. Design/Bid/Build Consider a forum for Chicago

Would like to put together a session on Three-D printing but have had trouble finding presenters.

Would like to identify some University case studies to put together a series of case studies for a seminar.

Rachel asked for volunteers who would like to chair or speak at future conferences.

Kishor is working on a conference paper on CFD modeling. He will be submitting it for Tampa.

See attached report for more information.

### **RESEARCH SUBCOMMITTEE REPORT**

Bob W gave a report: RP 1780 Test Method to evaluate cross contamination of total energy wheels. We are closing in on completion.

1835 TRP Characterizing the performance of induced flow stacks. The Ohio State University was awarded this project. This is just kicking off.

Subcommittee meetings were held virtually prior to the meeting. Everyone is free to join these meetings. They are listed in the ASHRAE 365 app.

RP 1833 Air change rates is in process.

TC 9.7 has proposed a research project on labs in higher education. A representative from TC 9.10 has not been able to attend their meetings yet.

See attached report.

### **STANDARDS SUBCOMMITTEE**

Justin is just getting his feet wet. Has no report at this meeting.

### **LAB CLASSIFICATION SUBCOMMITTEE**

Danny Sanchez gave a report. Danny shared some information about the work of the subcommittee. "Classification of Lab Ventilation Design Levels" was published in 2018 and is available for free download from the ASHRAE website. The committee is looking at some revisions to the document. They have a target deadline of 2025 but may need to align with other ASHRAE publications, which may increase the timeline.

The committee met last week. Trying to refocus the subcommittee efforts. They hope to re-organize the document to make it more practical. Tom Smith noted that the table that defines the attributes of the LVDL is a little difficult to use. Hope to re-sort the table to make it easier to follow and align it with the design guide.

Plan to do some outreach with other organizations. Looking also at DL program to help with education.

See attached report.

### **STANDARD 110**

Nathan Ho is the chair, but he was not present. Kurt Monteiro reported. They are looking at isopropyl alcohol or polypropylene as replacement for SF 6.

### **SPC 129 Measuring Air-Change Effectiveness**

The title has been changed to Ventilation Effectiveness. Tom Smith is chair and reported that they are getting ready to publish a three-part report which will include a CFD model and a field test. They hope to move this forward this year.

### **DESIGN GUIDE**

Ann Juran is the new chair of this subcommittee. The committee met last week and mostly focused on the general flow of the document and continuity of the chapters. A Table of Contents committee formed to look at this. Have performed a status update on all chapters. Chapter 6, Primary Air Systems needs a primary leader. and chapter 16 also needs a leader. Targeting a March 2025 completion date. Plan to meet every other month to stay on track. See attached report.

### **ASHRAE JOURNAL**

Roland Charneux reported that the Journal ran an article in the July 2022 issue on a Technology Award for a low energy lab titled "High Performance Lab, Low Energy Impact". There was also an article in the June 2022 edition titled "Factors influencing Face Velocity for Fume Hood Containment". Roland asked the committee to think about articles they could write for the Journal. The IEQ Column is a good opportunity.

### **YEA AND INTERNATIONAL MEMBER RECOGNITION**

Bob asked all YEA members to stand. The committee gave them a round of applause.

## **ALI COURSES**

Laboratory Design Course – The Basics and Beyond – John Varley reported that Sunday was the 9<sup>th</sup> Winter meeting for the course. Had 40 attendees. The course went well. John renovated and reorganized the course material. John would like for Chicago to be the transition to a new instructor.

Jim Coogan asked for John to write a brief description of what it takes to teach the course. It's a three-hour course so it's a time commitment.

Laboratory Exhaust Course – Safe and Energy Efficient Design – Brad said this course was not offered at this meeting.

Laboratory Controls Course – This has been proposed but have not received feedback from ASHRAE.

## **LIAISON REPORTS**

Bob stated he would like liaisons to provide a written report if possible so the TC can stay abreast of what's happening on other TCs.

TC 1.4 Control Theory and Application – Jim Coogan: No report other than Title 24 changes are affecting other reports.

TC2.2 Plant and Animal Environment- Henry is not present. No report.

TC 4.3 Martin Stangl was not in attendance. Ryan Porter reported that chapters 16 and 24 in the Fundamentals handbook will be updated. Airflow around buildings will also be updated.

TC5.1 Fans - Brent Fullerton was not present. Ken Kuntz reported that California Title 20 on fans and blowers will be taking effect soon. Induced flow fans are exempt from Title 20 but not from Title 24. DOE test procedure for industrial fans will be out soon.

TC5.3 Room Air Distribution– No liaison. Kishor stated there is nothing to report. Kishor agreed to be the liaison going forward.

TC7.6 Building Energy Performance – Pat Carpenter reported that there is not much going on related to labs. Decarbonization and energy efficiency are hot topics.

TC7.9 Building Commissioning – No liaison. Justin Garner was in the meeting but said there was no content related to labs. Justin agreed to be the liaison going forward.

TC9.2 Industrial Air Conditioning and Ventilation No liaison. No report.

TC9.6 Healthcare Facilities – Traci Hanegan said there's nothing new that hasn't already been reported. Tom Smith sat in on Standard 170 and there was discussion of stack discharge height. Accepted some changes to the description of the definition of stack height. He thinks this committee should review and comment on the standard when it comes out for public review. Brendon Burley said please talk to him about any comments you have on the standard.

TC9.7 Educational Facilities – Keith Hammelman reported that they have been busy. They issued a design guide for educational facilities. Have been reviewing the RTAR associated with lab classification. They have been discussing Maker Spaces and 3-D printing. Check out the TC website to learn what they discussed.

TC9.11 Clean Spaces – Roland Charneux reported issuing an RTAR on energy consumption in clean rooms. Working on a design guide for energy efficiency in cleanrooms.

MTG ACR – Kishor said Jim Coogan can report. Jim represents TC9.10 to this committee. There's a work statement being produced aimed at what else matters besides air change rates. What affect does ventilation effectiveness have? There's also a white paper being produced on air change effectiveness. Standard 241P on Pathogen mitigation – this MTG is involved in this effort.

62.1 Ventilation for Acceptable IAQ – Brendon Burley is the chair and reported that their agenda was dominated by requests for interpretation, particularly around space contaminants. Brendon is opposing changes to how labs are handled in the standard. If the institution has an EH&S officer guiding the ventilation strategy, they should not fall under 62.1. Tom suggested they use the same language in ANSI Z9.5 so the standards are aligned. Guideline 42.P, "Enhanced Indoor Air Quality in Commercial and Institutional Buildings" is out for public review. They also issued a revision to humidity requirements. They are maintaining the dewpoint limit. Added a requirement for control during occupied hours.

90.1 – Jason Atkisson reported that there's a bunch of addenda coming out on the 2022 standard. Task force for decarb is putting some requirements on 90.1. Looking into operating carbon reporting. This will be in an informative appendix but may become part of the standard for the next issue. 90.1 now has targets for energy projecting out to the future. This is due to carbon reduction targets. Also, will have renewable requirement in the future. Refer to attached report.

Epidemic Task Force – Brad Cochran reported they are winding down. Work will be distributed to appropriate TCs. Toronto was likely the last meeting for the ETF.

SMACNA – No liaison. No report

NFPA 45 – Ken Crooks reported that the new 2023 edition of NFPA 45 is delayed from the previously reported timeline due to a "Certified Amending Motion" being made. This motion will be reviewed at NFPA's Technical Meeting, late June in Las Vegas. The amending motion adds a new section with new text describing the materials of construction for "case furniture" and required flammability ratings. Release of the new 2023 edition should follow within months of NFPA's Technical Meeting.

NSF – Frank Spevak was not present. No report

ISPE – No liaison. No report

ANSI/ASSP Z9.5 – This has recently changed to ASTM. ASSP is no longer involved. There is an ASTM Z9 committee of which Z9.5 is a subcommittee. Jim Coogan is chair of Z9.5 subcommittee. Revised standard was published in April 2022. Jim Coogan was instrumental in getting this published. Jim thinks we should aim for an updated version to be published in 4 years, not ten years.

I2SL – Gordon reported that the I2SL annual conference will be in Anaheim in October. Everyone is invited. New this year will be Education Week which will be virtual and will use presentations from the conference in addition to new content. Hope to get some international participation. Education Week will be April 25-27. Call for papers for the main conference will be coming out soon. Decarbonization: I2SL has developed a tool called Labs2Zero to use as a benchmarking tool for carbon and energy reduction measures. I2SL is looking for volunteers to help with all aspects of the effort. You can sign up to help on the I2SL website.

Title 24 – Glen Friedman reported there is a prescriptive section that discusses covered processes. Laboratory requirements are covered here. There are several requirements. Committee members may want to review.

## **NEW BUSINESS**

None.

## **ADJOURN**

It was moved and seconded to adjourn at 5:47 PM EST



**ASHRAE TC 9.10 Laboratory Systems  
Program Sub Committee  
Monday January 30, 1:00-2:00 PM EST  
Meeting Minutes**

**Program Sub Committee Meeting, Atlanta Winter Meeting 2023**

**Attendees: (18)**

Christine Reinders	Tom Smith	Roland Charneaux
Rachel Romero	Glenn Friedman	Ken Crooks
Kevin Belusa	Chris Kirchner	Gary Goodson
Robert Weidner	Douglas Ross	Dillon Traphagen
Otto Van Geet	Rob Chopowick	Anu Tyagi
Jim Coogan	Pierre Luc Baril	Stefan Zandelin

**Programs**

**Sponsored Programs:**

**Seminar 59:** Kicking Out the Carbs: The Chemistry of Decarbonizing the World's Laboratories

**Chair:** Kelley Cramm

Wednesday, February 8 8:00 AM – 9:30 AM EST

Georgia World Congress Center, A402

**Co-Sponsored Programs:**

**Forum 2:** Air Change Rates: What Is it? Why Do We Need it?

**Chair:** Kishor Khankari

Wednesday, February 8 9:45 AM – 10:45 AM EST

Georgia World Congress Center, A406

**Future ASHRAE Conferences**

June 24 – 28, 2023 – Tampa, FL – Technical Chair – Bert Phillips

January 20-24, 2024 – Chicago, IL – Technical Chair – Suzanne LeViseur

June 22-26, 2024 – Indianapolis, IN – Technical Chair – Brian Fronk

**Future Programs Discussion**

**Tampa**

1. Safety Objectives & Operations & Effectiveness – By Safety topics or Job titles – Jim Coogan
  - a. Safety – EH&S
  - b. Engineering – Design Engineer
  - c. Operations - Facilities Operator
2. Forum on the energy savings you think you are getting but you are not
  - a. Jim - Chair, Tom Smith, Doug Ross
  - b. Exhaust Fan Flo, Energy Savings vs Fume Hood Flow & VAV sensitivity expectations, sensitivity, Controls Solution – Airflow Model
3. Airflow control performance – Jim Coogan
  - a. Submitted and not accepted. Rachel to assist with resubmit.
4. Panel on 29.5 standard update will be published – Jim Coogan Chair

**ASHRAE TC 9.10 Laboratory Systems  
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5. Portable air cleaners – ventilation effectiveness of filtration media, 3 presentations on challenging filtration, air tracer testing, ventilation effectiveness. Filter location, airflow patterns, space characteristics. Look at other committees – Tom Smith
6. BPI Air Cleaning Post COVID – Robert Weidner co-sponsor – Not yet submitted – perhaps in the future. Combine with Tom and Kishor?
7. Demand Control Ventilation in Labs to Reduce air flow rates
  - a. Kishor, Gordon Sharp? Tom Smith?

**Chicago:**

1. Unfamiliar Hazards - 3D Printing, Nano Science, (w/Environmental Health & Safety) – UL Group
2. Rachel – University of Chicago – University Lab Case Studies. With Ken Crooks to ask Northeastern again.

**Speaker Resources**

<https://www.ashrae.org/conferences/speaker-resources>

[https://www.ashrae.org/File%20Library/Conferences/Speaker%20Resources/SpeakersManual\\_0718.pdf](https://www.ashrae.org/File%20Library/Conferences/Speaker%20Resources/SpeakersManual_0718.pdf)

**Tampa Annual 2023 Conference Deadlines**

- **Friday, January 6, 2023** | Website opens for Seminar, Workshop, Panel, Debates and Forums
- **Friday, February 24, 2023** | Technical Paper Final Accept/Reject Notifications
- **Monday, February 27, 2023** | Debate, Panel, Seminar Form, Workshop Proposals Due
- **Wednesday, March 29, 2023** | Extended Abstract Paper Due and Conference Papers Due
- **Friday, April 14, 2023** | Debate, Panel, Seminar, Forum Workshop Accept / Reject Notifications
- **Wednesday, April 26, 2023** | Conference Paper Abstract Accept / Revise / Reject Notifications
- **Wednesday, May 10, 2023** | Revised Conference Papers, Technical Papers Due
- **Sunday, May 21, 2023** | Conference Paper Accept / Reject Notifications

**Tampa Tracks & Track Chairs June 2023**

1. **Fundamentals and Applications:** Brian Fronk - [Brian.Fronk@psu.edu](mailto:Brian.Fronk@psu.edu)
2. **HVAC&R Systems and Equipment:** NgYong Kong - [nyk@nyk.com.my](mailto:nyk@nyk.com.my)
3. **Research Summit:** Davide Ziviani - [dziviani@purdue.edu](mailto:dziviani@purdue.edu)
4. **Pathways to Net Zero Energy and Decarbonization:** Rafi Karim - [rkarim@aeieng.com](mailto:rkarim@aeieng.com)
5. **Future-Proofing the Built Environment:** Scott Peach - [sp@sp.engineering](mailto:sp@sp.engineering)
6. **Building Automation and Control Systems:** Raul Simonetti – [raul.simonetti@carel.com](mailto:raul.simonetti@carel.com)
7. **Professional Development and Education:** Ahmed Abdel-Salam - [ahaabdel salam@gmail.com](mailto:ahaabdel salam@gmail.com)

**ASHRAE TC 9.10 Laboratory Systems  
Program Sub Committee  
Monday January 30, 1:00-2:00 PM EST  
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**Chicago Tracks & Track Chairs January 2024**

1. **HVAC&R Systems and Equipment** – Ng Yong Kong
2. **Fundamentals and Applications** – Craig Bradshaw
3. **Refrigeration and Refrigerants** – Atilla Biyikoglu
4. **Decarbonization and Climate Change** – Som Shrestha
5. **Hydronic System Design** -- Joe Chow
6. **Ventilation, IAQ, and Air Distribution Systems** -- Ahmed H Abdel Salam
7. **Comfort, Indoor Air Quality, and Energy Efficiency** – Kristen Cetin
8. **HVAC&R Controls - how to make it all work** -- Alekhya Kaianathbhatta
9. **Design, Bid, Build and Design Build** -- Ehab Mamdouh Abu Taleb

**Chicago Winter 2024 Conference Deadlines**

- **June 14, 2023:** Website Opens for Program Proposals
- **June 28, 2023:** Conference Paper Abstracts Due
- **July 19, 2023:** Conference Paper Abstract Accept/Reject Notifications
- **August 2, 2023:** Program Proposals Due
- **October 16, 2023:** Conference Papers Due
- **November 8, 2023:** Conference Paper Accept / Revise / Reject Notifications

## ASHRAE 9.10 Research Subcommittee Winter 2023 Meeting Agenda (1/30/23)

### Minutes

1. **1780-RP Research Project** (*Test Method to develop a Methodology to Evaluate Cross Contamination of Gaseous Contaminants within Total Energy Recovery Wheels*) **Presentation: University of Saskatchewan – Easwaran Krishnan**
    - a. **Status of Research Project including Findings & Path Forward**
      - i. Final Draft issued and reviewed by PMS
      - ii. Final report to be completed by March 2023
      - iii. Hybrid Presentation: Tuesday 2PM in Atlanta
  2. **1835-TRP Update-1835-TRP** (*Characterizing the Performance of Entrained Flow Stacks*) – Brad C. (CPP)
    - a. Project was awarded to Ohio State University
    - b. Project Kick-off during 2023 Winter Meeting (Monday at Noon)
    - c. Brad update -
  3. **Research Projects still under consideration**
    - a. RTAR for “Survey of sources of contamination in existing labs” Roland C. and Tom Smith (Still on hold but getting to the point of moving forward).
    - b. 1573 (SF-6 Replacement Gas) **No further research needed**
    - c. **Ventilation Effectiveness for Labs** – Variety of Groups doing this work - I2SL, ASHRAE MTG ACR, SP 129; Kishor – Ventilation Effectiveness – RTAR is approved; have some industry support; **Work Statement in process.**
    - d. Using Analytics to help better operate buildings – **Future research**
    - e. *Demand Control Ventilation in labs to reduce air flow rates – Good idea to have forum; Kishor ready for Seminar – Need 2 more speakers – Gordon Sharp?, Overview of DCV – Tom Smith; What is it, How does it work? Avoid commercialism. Tom follow up! Move to program. Paul Fusson, Amanda, Rachel – Chair – Chicago – Chicago Program?*
    - f. Hourly data on lab plug loads needed; are metrics available? Database follow up from Labs21 may be helpful – **Future Program**
  4. **Review of pertinent on-going research outside 9.10**
    - a. RP 1833 – Air Change Rates – **Research Complete**; mid Feb project finish – **Future program** should come out of this.
    - b. Work Statement 1936 – Air Change Rates vs. Effectiveness – In preparation – co-funded by Price; MTG ACR – **Work Statement in development.**
    - c. 3D Printing Hazardous Issues (nano particles, chemicals, fumes, etc.) – TC 9.7 discussing; Roland to follow up and also Jason Atkisson
    - d. Labs being used in Higher Education (TC 9.7) – Jason Atkisson to confirm status
  5. **New Research Topics for consideration:**
    - a. Tom Smith – AIHA – Hazardous emissions in Vivariums; nuisance odors, air changes – historic design practices; advances in technology; **Defining Hazard Emission scenarios for airflow specifications! MTG – Discuss further in leadership meeting!**
  6. **Seminar Carbon Emissions within labs – White paper being worked on. Kelley, Rachel, Gordon – Wed @ 8AM – comments/feedback from seminar.**
-

**Attendees:**

- 1. Bob Weidner – Research Chair**
- 2. Tom Smith**
- 3. Tyler Kee**
- 4. Anupriya**
- 5. Brad Cochran**
- 6. Chris Kirchner**
- 7. Gary Goodson**
- 8. Glenn Friedman**
- 9. Jason Atkisson**
- 10. Guy Perreault**
- 11. Kishor Khankari**
- 12. Ken Crooks**
- 13. Pierre Luc Baril**
- 14. Stephan Sandelin**

## Lab Classification Subcommittee Report

From Danny Sanchez

### Introduction to LVDL Doc.

- Doc – Classification of Laboratory Ventilation Design Levels
- Rather new Doc and not very well know
- Idea was born about a decade ago
- First Edition Published in 2018
- Second Edition in the works (streamlining and practicability)
- Target deadline – 2025 (to align with other ASHRAE publications E.g. Lab Design Guide)
- Free PDF. Can be found in the ASHRAE Bookstore

### Sub-Committee work:

- Meeting every 1-2 months (next meeting scheduled for early March)
- Meeting minutes from last week's meeting posted in BaseCamp
- Current plan & priorities:
  - o Doc. re-organization (Tom S.)
    - Streamlining and practicability
  - o Outreach/PR campaign
    - Conferences: I2SL, SL, Lab Design Conf.
    - Presentations: Webinars, Distinguished Lecturer Program
  - o Integration with other publications:
    - Lab Design Guide, Handbook
    - Alignment with new ACH approach
  - o Renewed Membership
    - Focus on original intend:
      - ACS - American Chemical Society &
      - AIHA - American Industrial Hygiene Association
    - Call to volunteers

### Danny Sanchez, P.Eng., PMP

Senior Manager, Technical Services

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## TC 9.10 Laboratory Design Guide Subcommittee

Meeting Minutes  
31 January 2023  
Virtual (via WebEx)

### Attendees:

Bob Weidner  
Guy Perreault  
Anupriya Tyagi  
Brooks Stout  
Chris Kirchner  
Dan Frasier  
Danny Sanchez  
Dillon Traphagen  
Douglass Ross

Gary Goodson  
Glenn Friedman  
Jason Atkisson  
John Castelvechi  
Ken Crooks  
Kevin Belusa  
Kishor Khankari  
Mike Carl  
Otto Van Geet

Pierre Luc Baril  
Rachel Romero  
Roland Charneux  
Stefan Zandelin  
Tom Smith  
Tyler Kee  
Anne Juran

### Discussion:

1. There was general discussion on the flow of the entire document
  - a. It was recommended that there be a committee to review the entire flow (sort of like a master editor)
  - b. Technical editing from ASHRAE is limited.
  - c. Pointed out that its not meant to be a book that someone would read start to finish so the flow and duplication may not be so critical.
  - d. Recommended that there be a navigational flow chart (not quite an index) to help find things.
  - e. Folks volunteered to form the Table of Contents (TOC) Committee to work on this
2. We reviewed the status of each chapter. See "Notes" column in table below.
3. Remember who audience is:
  - a. Consulting engineers
  - b. Lab planners
  - c. O&M staff
  - d. Cx
  - e. Lab safety managers
4. This is also believed to be a fundamental document for the lab design course. The current instructor will be retiring from this position soon. We'll get more feedback on this topic in the future.
5. Goal is to complete the Guide by March 2025.

### Chapter status:

Ch	Title	Chapter Lead	Edit/Review Team	Notes
TOC			Tom Smith, Guy Perreault, Chris Kirchner, Doug Ross, Bob Weidner	-There are many comments in the document

				-Need a wholistic review of the entire document – chapter to chapter is lacking continuity -form committee to focus on outline & possibly reorganize & remove duplication / conflicts and check references
1	Introduction	Bob Weidner		Wait for end
2	Background	Bob Weidner		Wait for end
3	Design Process	Chris Kirchner	John Castelvechi, Wade Conlan, Doug Ross	
4	Laboratory Planning	Brooks Stout	Harris Sheinman, Danny Sanchez	-Needs more work – will review in the next month -incorporate / reference lab classification?
5	Exhaust Hoods	Kurt Rindoks	Larry Meisenzhal, John Castelvechi, Brooks Stout, Ken Kuntz, Tom Smith	
6	Primary Air Systems		Bob Weidner, Brendon Burley, Charles Murphy, Wei Sun, Pierre Luc Baril	-Need someone to take the lead – ask Tuesday
7	Process Cooling	Jason Atkisson	Brooks Stout, Charles Murphy	-Halfway done -Finished by summer mtg
8	Air Treatment	Bob Weidner	Rami Alkahlil, Charles Murphy	-Done by end of March
9	Exhaust Stack Design	Brad Cochran	Ken Kuntz, Glenn Friedman, Martin Stangl	-(need to reach out to Brad for an update)
10	Energy Recovery	Roland Charneux	Bob Weidner, Brendon Burley, Chris Kirchner, Glenn Friedman, Charles Murphy	
11	Controls	John Castelvechi	Guy Perrault, John Garrett Neubauer, Brendon Burley, Brad Cochran, Doug Ross, Ken Kuntz, Jim Coogan, Wei Sun	
12	Airflow Patterns and Pressurization	Wei Sun	Tom Smith, Salil Sansare, Dan Frasier, Jim Coogan	-Need subcommittee to figure out what's appropriate



13	O&M for Ventilation and Exhaust systems	Stefan Zandelin	Carol Donovan, Tom Smith, Harris Sheinman, Guy Perreault, Stefan Zandelin, Danny Sanchez	-Stefan will go through it first and then hold a subcommittee mtg
14	Laboratory Commissioning Process	Daniel Frasier	Carol Donovan, John Garrett Neubauer, Tom Smith, Wade Conlan, Glenn Friedman, Harris Sheinman, Mike Amstadt	
15	HVAC System Economics		Rajendera Kapoor, Tao Zhang	-Need to ask for help at the general meeting
16	Microbiological and Biomedical Laboratories	Daniel Frasier	Carol Donovan, Rami Alkahlil, Harris Sheinman, Wei Sun	
17	CFD Modeling of Laboratory Ventilation	Kishor Khankari	Brad Cochran, Chris Kirchner, Mike Carl	-Working on it
18	Sustainable Design	Rachel Romero	Brooks Stout, Chris Kirchner, Tao Zhang, Roland Charneux	-Has been reviewed -Should be closer to beginning of the guide? -TOC committee can assess location
19	????			-Seems like there won't be a Chapter 19 – TOC committee will assess
20	Ventilation Effectiveness	Kishor Khankari	Salil Sansare	-May be part of Chapter 17???
21	Testing	Tom Smith		-Covered in Cx & O&M – probably won't need to be a separate chapter
SG	Smart Guide	Christine Reinders	Rachel Romero	
NEW	Lab Classification – How to use Guide (placed in smart guide)	Danny Sanchez	Adam Bare	
Add to 5	Exposure Control Devices	Tom Smith	Salil Sansare, Harris Sheinman	-Done but needs to be incorporated into Chapter 5
Color code:	Completed	Ready for Review	Edits underway	Unknown

## Kelley Cramm

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**From:** Roland Charneux <rcharneux@pageaumorel.com>  
**Sent:** Tuesday, February 7, 2023 4:22 PM  
**To:** Kelley Cramm  
**Subject:** TC-9.10 Journal report

[EXTERNAL EMAIL]

Hi Kelley

<b>High Performance Lab, Low Energy Impact</b>								
<b>Authors:</b>	<b>Michael Radio, P.E., BEMP; Jonathan Friedan, P.E.; Tim Hagenbach,</b>							
<b>Citation:</b>	ASHRAE Journal. Vol. 64. no. 7. July 2022							
<b>Pages:</b>	8							
<b>Publish Date:</b>	<b>July 2022</b>							
<b>Publisher:</b>	ASHRAE							
<b>Factors Influencing Face Velocity for Fume Hood Containment</b>								
<b>Authors:</b>	<b>Kang Chen, Ph.D., Member ASHRAE</b>							
<b>Citation:</b>	ASHRAE Journal. Vol. 64. no. 6. June 2022							
<b>Pages:</b>	11							
<b>Publish Date:</b>	<b>June 2022</b>							
<b>Publisher:</b>	ASHRAE							

**Roland Charneux**, ing., M.Eng.  
PA LEED BD+C, HFDP, ASHRAE Fellow  
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Below are my liaison report notes to fill in for Martin for the updates from TC4.3 relevant for 9.10.

2025 Fundamentals Chapters are up for review. Please review the online versions and provide any feedback to Neetha, Marianne, and Ted.

Ch 16 - Ventilation and Infiltration. Lead Reviser: Ted Stathopoulos ( [statho@bcee.concordia.ca](mailto:statho@bcee.concordia.ca))

Ch 24 – Airflow Around Buildings. Lead Reviser: Marianne Touchie ( [marianne.touchie@utoronto.ca](mailto:marianne.touchie@utoronto.ca))

Comments can be sent to: [TC0403.HBK@ashrae.net](mailto:TC0403.HBK@ashrae.net)

-RTARs proposed:

1. Updating garage ventilation requirements for specific location vehicle type makeup due to improvements in vehicle emissions and electrification.
2. Providing more accurate default ventilation effectiveness value for Std 62.1 than the current 0.8 when in heating. Recent testing by Frank Godbout suggests the effectiveness is significantly lower ( $<0.25$ ).

Thanks,

Ryan



**Ryan S. Parker, PhD** | Senior Engineer

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TC 5.1 Fans  
Winter 2023

-Research Project 1835 characterization of induced flow fans  
Successful bidder selected (Ohio State) and project has kicked off

-California Title 20 appliance standard  
Efficiency standards for commercial industrial fans and blower becomes effective Nov. 16, 2023  
Induced flow fans are exempt

-DOE test procedure for industrial fans and blowers  
Final rulemaking expected to be published by March

## TC-9.10 Liaison report for TC-9.11

### From Roland:

1- RTAR in preparation to survey Cleanroom energy consumption to better understand where the energy is consumed and then where to take action.

2- Design guide on energy efficiency in cleanrooms is planned to be developed

# SSPC 90.1 Liaison Report / 2023

## Winter Mtg



Jason A Atkisson

Last updated Feb 5

I was able to attend the Saturday (2/4) morning Full Committee meeting of SSPC 90.1. The following topics were discussed during that meeting:

1. Reviewed updates from PNNL on their modeling efforts related to proposed addenda to the 2022 version. Updates of note are related to Renewable Energy System requirements and Thermal Bridging (Envelope).
2. Of particular importance for this committee is the request from the AES Working Group related to the review and recommendations for updates/modifications/addition to the prototype buildings.
  - PNNL believes that the current prototype buildings represent about 75% of the building stock utilizing the most energy
  - Specific discussion regarding the proposed inclusion of Agricultural Grow Facilities
3. Inclusion of Decarbonization Goals are a focus for the working groups with a goal of carbon neutrality as part of the Standard by 2031
  - There is a new Working Group on "Net Zero Operational Carbon Emissions" which includes Code Jurisdictional Option
  - This would be included as an Informative Appendix - ready for 2025
4. Key Initiatives of the SSPC:
  - Continued Development of New Compliance Paths
  - Reduction of Operational Carbon
  - Expansion of Renewables - on and off site
  - Improved Management of Energy Use (Storage)
  - Encourage Building Resilience Efforts
  - Carbon Emission Reporting
  - Transition to Net Zero
5. Updated Targets for future Standard Releases (when compared to the 2004 Std)
  - Energy Cost: 43% in 2022; 50% in 2025; 55% in 2028; and 65% in 2031

- Carbon Emissions: 48% in 2022; 65% in 2025; 83% in 2028; and 100% in 2031
- % of Energy Use from Renewables: 3% in 2022; 13% in 2025; 24% in 2028; and 35% in 2031

**Of particular importance or attention for TC 9.10** is the request to review the prototype buildings and make recommendations for the addition of new prototype buildings. The closest prototype building currently is a Hospital - which is not representative of a Laboratory Building.

- I would like full committee support to make a formal request to the 90.1 AES Working Group for the addition of a Laboratory Building to the prototype building set.
- In order to do so, I believe we will also need to recommend parameters that classify a building as a Laboratory Building
- My proposal is as follows:
  - "The definition of a laboratory building shall be any structure whose building program includes XX% or more of the defined program that is identified as "Laboratory or Lab", and where the design requirements for those spaces are that they be 100% exhausted and operated continuously." OR
  - "The definition of laboratory building shall be any structure where over XX% of the total building peak design supply airflow is categorized as outside air, and where the building operates continuously.

New boost

From Ken Crooks:

The new 2023 edition of NFPA 45 is delayed from the previously reported timeline due to a "Certified Amending Motion" being made. This motion will be reviewed at NFPA's Technical Meeting, late June in Las Vegas.

The amending motion adds a new section with new text describing the materials of construction for "case furniture" and required flammability ratings. Release of the new 2023 edition should follow within months of NFPA's Technical Meeting.