

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING  
ENGINEERS, INC.  
1791 TULLIE CIRCLE, N.E./ATLANTA, GA 30329  
404-636-8400**

**TC/TG/TRG MINUTES COVER SHEET**

TC/TG/TRG NO	9.10	DATE	June 25 <sup>th</sup> , 2019
TC/TG/TRG TITLE	Laboratory Systems		
DATE OF MEETING	June 25 <sup>th</sup> 2019	LOCATION	Kansas City

Members Present	Term Expires	Members Absent	Term Expires	Ex-officio members and additional attendance
Jim Coogan	2019	David Rausch	2019	C. Reinders-Caron
Carol Ann Donovan	2019	Adam Bare	2020	R. H. Weidner
Guy Perreault	2019	Eric Ballachey	2022	K. Khankari
Nathan Ho	2020			J. Varley
Wade Conlan	2020			B. S. Dlngman
Traci Hanegan	2020			J. Castelvechi
Jason A Atkisson	2021			C. Kirchner
Patrick Carpenter	2021			G. Augustini
Kenneth W Kuntz	2021			R. Parker
Tom Smith	2021			R. Romero
Brad Cochran	2022			D. Ross
Brent Fullerton	2022			K. Shifflett
Jacob Edmondson	2022			D. Hammond
				J.S. MacMurray
				P.R. Lemestre
				H. Bohanon
				T. Wheeler
				B. Stout

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## DISTRIBUTION

<i>All Members of TC/TG/TRG plus the following:</i>	
TAC Section Head: Vance Payne	
TAC Chair: Tom Justice	
All Committee Liaisons As Shown On TC/TG/TRG Rosters:	

Standards liaison: Roger Hedrick	
Manager of Research & Technical Services Mike Vaughn	
Research liaison: Paolo Tronville	

### **Call to order 3:30**

Brad Cochran called the meeting to order. Quorum is met, 13 of 16 members are present. (12 at roll call)

Brad gave a review of the history of the TC.

Brad reviewed the TC 9.10 Website – need more FAQs

Quorum – 12 of 16 to meet Quorum. 4 people

Rolling off – Carol Donovan, Jim Coogan, Guy Perreault, and David Rausch. Rolling on - Christine Reinders-Caron, Martin Stangl, Mary Foutz, Lloyd Lee, Guy will be taking over as the chair after a year off. Four more people roll on in July of 2020.

### **Introductions**

Brad requests that everyone present introduce themselves to the group and sign the attendance sheet.

### **Membership Update (Brad Cochran/ Guy Perreault)**

Brad mentions the voting members rolling off after the Kansas City Meeting and the new members who will be rolling on in Orlando.

Rolling off June 30<sup>th</sup> 2019, (after Kansas City meeting)

Guy Perreault

David Rausch

Jim Coogan

Carol Donovan

Rolling on July 1<sup>st</sup> 2019 (First meeting Orlando)

Christine Reinders-Caron

Martin Stangl

Mary Foutz

Lloyd Lee

### **Approval of Houston meeting minutes (Brad Cochran)**

Minutes from the Atlanta meeting were emailed previously. Update the header to the minutes.

Unanimous

Minutes from the meeting were reviewed.

Moves to approve: Jim Coogan

Vote: Minutes approved unanimously

### **Section Head Report (Vance Payne)**

- ASHRAE looking to shrink the technical program and absorb some of the smaller TCs
- ASHRAE encourage having online meetings before the conference to reduce the number of rooms to be organized. People are not attending the sessions.
- TC9.10 Website looks good

### **Research Subcommittee (Bob Weidner)**

- See sub-committee report on attachment.
- RP1573 – SF6 replacement gas – Tom will give an overview. Research is completed. Finalized by September 2019. Extended through July 1<sup>st</sup>. No cost extension.

Vote for 6 month extension – 10 approved, 2 abstentions (Brad and Tom)

- Work statement – Energy Recovery Wheels by Roland who has completed the work statement. Will go out to rebid to get it under 200k cost and get more bidders per ASHRAE comments. Fine tune the work statement by Sept.
- Work statement 1835 – Entrained flow stacks. Need a vote to get it out to bid.

Vote to send back to RAC – 11 approved, 1 abstained, 0

- RTARS in consideration – Source of contamination in existing labs
- RTAR on Airchange rates with MTG
- 9.7 RTAR – Research on labs in higher education
- Research on duct velocity in fume hood exhaust

Vote for : 11 for, 0 against, 1 abstain (Tom Smith)

### **Program Subcommittee (Christine Reinders-Caron)**

- See sub-committee report on attachment. August 11 is the deadline for Seminars

Summary of Seminar 8 – New publication on classification of lab level

Summary of Seminar 24 – Art and Science of reducing

### **Handbook Subcommittee (Lou Hartman absent)**

- No report – no handbook

### **Standards (Wade Conlan, Gaylan is absent)**

- Standard 110 met today. Working on the timeframe for rewriting. Nathan Ho will be the new chair
- New Revision will handle the new tracer gas.

### **Laboratory Design Guide (Ken Kuntz)**

- Chapter 3, 5, 11 are being worked on and edits.
- Additional chapter suggestions
- Smart guide – videos, etc can add to the electronic portal
- Ideally all chapters done in 5 years -

### **Journal (Roland Charneux- absent)**

- Roland – no new journals in 6 months. Recommend transferring work to a journal

### **ALI - Laboratory Design Course (John Varley)**

- It the first time that the Laboratory Design Course is not offered in KC
- Brad Cochran submitted a course to ALI on Laboratory Exhaust – 15 attendees
- John Castelvechi has prepared the basis for a laboratory controls course. John is to lead the project. Abstract has not been submitted. John and Jim will coordinate.

### **Liaison Reports**

TC 1.4 Control Theory and Applications – (Jim Coogan reported)

- TC1.4 – Maintaining guideline 36. Have 1 written addenda.

TC 2.2 Plant and Animal Environment (Henry Hayes)

- A lot of discussion on indoor agricultural. ASABE and ASHRAE co-developing a standard for indoor plant production without sunlight.
- MTG developed design systems and equipment – tall buildings for vertical structures

TC 4.3 Ventilation Requirements and Infiltration (Martin Stangl not here/ John Carter CPP)

- New research ideas and voted to move RTAR

TC 5.1 Fan Design and Application (Brent Fullerton)

- Voted to move the research project

TC 5.3 Room Air Distribution (no report) – remove from the list

TC 7.6 Building Energy Performance (Patrick Carpenter)

- No work directly related – tag pat carpenter

TC 7.9 Building Commissioning – (John Castlevech)

- Volunteers from 9.10 to help on Lab commissioning guide

TC 9.2 Industrial Air Conditioning (Bill Kumpf – absent)

- Nothing specific to report

TC 9.6 Healthcare Facilities (Traci Hanegan absent )

- Standard for testing equipment – Email tracy for updates

TC 9.11 Clean Spaces (Roland Charneux)

- Presentation on new clean room design guide

MTG / ACH – Jim Coogans / Kishor

- MTG approved it. Research project award is expected. Literary research report. Kishor commented that committee members are volunteering to put in time and efforts to perform the research without the cost from ASHRAE.

90.1 See report in the Standards S-C section. (Jason Atkinson)

- Getting ready to publish 2019 version – nothing on labs

62.1 (Nathan Ho)

- Kishor gave a presentation at 62.1 on airchange rates and reduce volumes to reduce airflows.
- Separation distance between supply and exhaust – calculation based on a research project

ASSE Z9.5 (Jim Coogan for Tom Smith)

- No report.

I2SL (Gordon Sharp)

- Benchmarking program is moving along – beta testing on the interface.
- The Annual Conference will be in Denver October 20<sup>th</sup>-23<sup>th</sup> 2019

### **Old business (Roland Charneux)**

- TC mergers
- Work rooms for subcommittee meetings to promote collaboration between TCs
- Establish performance goals for the working groups to stay productive
- Standards sub-committee is a rehash of liason reports – no need for separate meeting
- Personal Service awards in Orlando

### **New business**

- Brad commented that the meetings have not changed in 20 years. Need to make some changes to the way our meetings are done.
- Need to start using base-camp – need a volunteer to manage basecamp – website
- Lab Design guide is a focal point for this TC and should make it a priority
- Brad bring new young members
- Coordinate a TC9.10 social

**Main Meeting adjourned at 5:25 pm.**

## **ASHRAE 9.10 Research Subcommittee Meeting Agenda (with current work status)**

Kansas City - June 23, 2019

### **Research Projects:**

*RP 1573 – SF6 Replacement Gas Project Status (Tom Smith – 3Flo)*

1. Overview of Project Status – Tom Smith
2. Research completed
3. Report to be completed by September 2019

### **Work Statements:**

*WS 1780 (Test Method to develop a Methodology to Evaluate Cross Contamination of Gaseous Contaminants within Total Energy Recovery Wheels) – Roland C.*

1. All bids and totals were not provided in time for Atlanta 9.10 Meeting Vote. PES Chair Bob Weidner determined that there was not sufficient time to properly evaluate the bids and discuss with PES prior to TC meeting.
2. Review Summary: There was only one bidder and the price exceeded the work statement cost of \$200,000. Average of votes exceeded 80% mark.
3. Post Winter Meeting: After further discussions with Research Liaison and ASHRAE Mike Vaughn, it was very unlikely that the research would be approved due to a single bidder with a high price tag (despite average scoring being above 80%). Too many levels of approval to go through.
4. Bob Weidner to do follow up conference call with PES post summer meeting to address minor work statement items as suggested by RAC and PES in an effort to secure multiple bidders.
5. We would be interested in any insight to additional bidders for this project.
6. As per TC Chair breakfast, PES should meet and do their recommendation.

*WS 1835 (Characterizing the Performance of Entrained Flow Stacks) – Brad C. (CPP)*

1. There was 2 vote against in TC-5.1, RAC requested that to be sorted. WS was adjusted and now TC-5.1 voted to approve the WS.
2. The following fan manufacturers accepted to be co-funders: Greenheck, MK Plastic, Loren Cook and Strobic air.
3. AMCA wants to be a one of the bidders.
4. Updated Work Statement should go to TC-9.10 for a vote at Main Meeting.
5. **11-0-0 to move to RAC at 9.10 Board Meeting on 6/25/19**

### **RTARS in progress, initiated or under consideration:**

1. RTAR to “Survey of sources of contamination in existing labs” Roland C. and Tom Smith (on hold)
2. RTAR on Air Change Rates: MTG committee encompassing several TC’s looking into the why’s and where’s of Air Change Rates

3. 9.7 Higher Education – working on RTAR looking for TC9.10 to Co-sponsor specifically research for “labs being used in higher education”. Waiting on 9.7 This is in relation with ASHRAE bEQ and benchmarking
4. 1573 Follow-up Research Project to address additional scope not addressed in SF-6 Replacement Study (Bob Weidner and Tom Smith to develop RTAR post SF6 Research)
5. Research on duct velocity of fume hood exhaust.
6. Correlation between exhaust flow and supply airflow. Sensitivity of modulation. Mechanism to challenge systems. Terminal unit reset. Commissioning tools.

ASHRAE KANSAS CITY	
TC-9.10 RESEARCH	
June 23 <sup>rd</sup> 15h30	
NAME	E-MAIL
ROLAND CHARNEUX	RCHARNEUX@PARAUMOREL.COM
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BRAD COCHRAN	bcochran@cppwind.com

**ASHRAE TC 9.10 Laboratory Systems  
Kansas City Program Sub Committee  
Sunday June 23, 2019 4:15pm  
Meeting Minutes**

**Program Sub Committee Meeting, Annual Meeting Kansas City 2019**

**Attendees:**

Christine Reinders	Tom Smith	Karl Aveard
Ken Kuntz	Kishor Khankari	Brad Cochran
Jason Atkisson	Martin Stangl	Eric Ballachey
Brendan Dingman	Mark Hydeman	Wenhong(Eddie) Xue
Henry Hays	Jim Coogan	

**Kansas City Programs**

**Sponsored Programs**

**Sunday 9:45 to 10:45 a.m.**

KCCC Room 2101

*Seminar 6* – Diet and Exercise for Healthy High-Performance Buildings

Chair – Christine Reinders

Speakers – Kelsey Leslie, Vanessa Friedberg, Morgan Hilke

KCC Room 2105

*Seminar 8* – What’s New in Laboratory Ventilation: ASHRAE’s New Publication “Classification of Laboratory Ventilation Design Levels”

Chair – Kelley Cramm

Speakers – Tom Smith, Ellen Sweet

**Monday 8:00 to 9:30 a.m.**

KCCC Room 2013C

*Seminar 24* – The Art and Science of Reducing Flow to Improve Safety and Stop Wasting Energy in Labs

Chair – Carol Donovan.

Speakers – Tom Smith, Kishor Khankari, Philip Sloan

**Short Courses**

**Tuesday 8:00 to 11:00 a.m.**

KCCC Room 2206

*ALI Short Course* – Laboratory Exhaust Stacks: Safe and Energy Efficient Design

Instructor – Brad Cochran

**Future ASHRAE Conferences**

February 3-5, 2020 – Orlando, FL – Technical Chair – Melanie Darby

June 27- July 1, 2020 – Austin, TX – Technical Chair – Bing Liu

January 25-27 2021 – Chicago, IL – Technical Chair – Maggie Moninski

June 26-30, 2021 – Phoenix, AZ – Technical Chair – Christine Reinders

**Orlando Submissions**

1. Conference paper on air change rates - Kishor
2. Impact of Volume on Dilution at various air change rates
  - a. Chair – Carol Donovan
  - b. Speakers – Kishor, Tom, Cliff

**ASHRAE TC 9.10 Laboratory Systems  
Kansas City Program Sub Committee  
Sunday June 23, 2019 4:15pm  
Meeting Minutes**

3. Labs Design Guide & Smart Guide Forum
  - a. Chair – Ken Kuntz
  - b. Speakers –
4. Fume Hood Containment Strategies / Techniques to improve safety of Laboratory Fume Hoods
  - a. Chair – Jim Coogan
  - b. Speakers – Larry, Kurt, (+2 more?)
5. Static Pressure Control & Reponse Rate
  - a. Chair – Christine Reinders
  - b. Speakers – Jim Coogan, Guy Perreault
6. Smart Labs Accelerator
  - a. Chair – Eric Ballachey
  - b. Speakers – Tom Smith, Rachel Romero
7. Results of Tom's research project – Submit for Austin 2020

**Orlando Tracks**

**1. HVAC&R Fundamentals and Applications:**

**Track Chair:** Maggie Moninski  
[maggie.moninski@gmail.com](mailto:maggie.moninski@gmail.com)

**2. Systems and Equipment:**

**Track Chair:** Rick Hermans  
[herma015@umn.edu](mailto:herma015@umn.edu)

**3. Refrigeration and Refrigerants:**

**Track Chair:** Stephen Idem  
[sidem@tntech.edu](mailto:sidem@tntech.edu)

**4. Cutting Edge Approaches:**

**Track Chair:** Marianna Vallejo  
[marianna.vallejo@jacobs.com](mailto:marianna.vallejo@jacobs.com)

**5. High Efficiency Design and Operation:**

**Track Chair:** Ryan MacGillivray  
[ryan.macgillivray@dwel.com](mailto:ryan.macgillivray@dwel.com)

**6. Big Data and Smart Controls:**

**Track Chair:** Leticia De Oliveira Neves  
[leneves@gmail.com](mailto:leneves@gmail.com)

**7. Ventilation, IAQ and Air Distribution Systems:**

**Track Chair:** Robert Cox  
[bob.cox@jacobs.com](mailto:bob.cox@jacobs.com)

**8. Standards, Guidelines and Codes:**

**Track Chair:** Lee Riback  
[lee.riback@gmail.com](mailto:lee.riback@gmail.com)

**Orlando Deadlines**

**Monday, March 18, 2019:** Conference Paper Abstracts, Technical Papers and Paper Session Requests Due

**Monday, April 22, 2019:** Conference Paper Abstract Accept/Reject Notifications

**Friday, June 7, 2019:** Website Opens for Seminar, Workshop, Forum, Debate, and Panel Proposals

**Monday, July 8, 2019:** Final Conference Papers Due - Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment); Request for Conference Paper Sessions Due

**Friday, July 26, 2019:** Conference Paper Accept/Revise/Reject Notifications

**Friday, August 2, 2019:** Seminar, Workshop, Forum, Debate, and Panel Proposals Due

**Friday, August 9, 2019:** Revised Conference Papers/Final Technical Papers Due

**Friday, August 26, 2019:** Conference and Technical Paper Final Accept/Reject Notifications

**Friday, October 4, 2019:** Seminar, Workshop, Forum, Debate, and Panel Accept/Reject Notifications

**Speaker Resources**

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

**ASHRAE TC 9.10 Laboratory Systems  
Kansas City Program Sub Committee  
Sunday June 23, 2019 4:15pm  
Meeting Minutes**

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

**Extended Abstracts to continue at Annual Conference Research Summit Tracks**

For the first time, ASHRAE is making available to authors an extended abstract option for the 2019 Annual Conference Research Summit track only.

**Austin 2020 – June 27-Jul 1**

**Monday, August 12, 2019:** Conference Paper Abstracts, Technical Papers and Paper Session Requests Due

**Friday, August 30, 2019:** Conference Paper Abstract Accept/Reject Notifications

**Monday, December 2, 2019:** Conference Papers Due - Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment)

**Friday, December 20, 2019:** Conference Paper Accept/Revise/Reject Notifications

**Wednesday, January 8, 2020:** Website Opens for Seminar, Workshop, Panel, Debate, Forum and Extended Abstract Proposals

**Monday, January 13, 2020:** Revised Conference Papers/Final Technical Papers Due

**Monday, February 10, 2020:** Program (Seminar, Forum, Workshop, Debate and Panel) and Extended Abstract Paper Due

**Tuesday, February 18, 2020:** Conference and Technical Paper Final Accept/Reject Notifications

**Monday, March 2, 2020:** Extended Abstracts Accept/Reject Notifications

**Monday, March 16, 2020:** Debate, Panel, Seminar, Forum, Workshop Accept/Reject Notifications

**Friday, May 1, 2020:** Upload of presentation open for review

**Monday, June 1, 2020:** Presentation submissions due

**Austin Tracks**

- |   |   |
|---|---|
| <p>1. <b>Fundamentals and Applications:</b><br/><a href="mailto:Rupesh_iyengar@yahoo.com">Rupesh_iyengar@yahoo.com</a></p> <p>2. <b>HVAC&amp;R Systems and Equipment:</b><br/>a. Ashu Gupta<br/><a href="mailto:Ashu.energy@gmail.com">Ashu.energy@gmail.com</a></p> <p>3. <b>Research Summit:</b><br/>a. Kristen Cetin<br/><a href="mailto:kcetin@iastate.edu">kcetin@iastate.edu</a></p> <p>4. <b>Professional Development:</b><br/>a. Devin Abellon<br/><a href="mailto:devin.abellon@yahoo.com">devin.abellon@yahoo.com</a></p> <p>5. <b>Grid-Interactive Efficient Built Environment:</b><br/>a. Vikrant C Aute - <a href="mailto:vikrant@umd.edu">vikrant@umd.edu</a></p> <p>6. <b>Multifamily and Residential Buildings:</b><br/>a. Sonya Pouncy</p> | <p><a href="mailto:sonyapouncy@gmail.com">sonyapouncy@gmail.com</a></p> <p>7. <b>Resilient Buildings and Communities:</b><br/>a. Christine Reinders-Caron<br/><a href="mailto:christinereinders@gmail.com">christinereinders@gmail.com</a></p> <p>8. <b>Zero Energy Buildings and Communities: Opportunities and Challenges.</b><br/>a. Raul Simonetti<br/><a href="mailto:raul.simonetti@carel.com">raul.simonetti@carel.com</a></p> <p>9. <b>Building Myths:</b><br/>a. Kimberly Pierson<br/><a href="mailto:kdpwildcat@gmail.com">kdpwildcat@gmail.com</a></p> |
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**ASHRAE TC 9.10 Laboratory Systems  
Atlanta  
Tuesday January 15rd , 2019  
Meeting Minutes**

**ASHRAE TC 9.10 Laboratory Systems  
Kansas City, MO  
Sunday, June 23, 2019**

**Standards Committee Minutes**

**-No Meeting**

DRAFT

**ASHRAE TC 9.10 Laboratory Systems Kansas City**  
**Laboratory Design Guide Sub-Committee**  
**Tuesday June 25, 2019 2:30-3:30pm**  
**Meeting Notes**

**Attendance:**

Ken Kuntz	Brad Cochran	John Garrett Neubauer	Daryl DeAngelis
Brendan Dingman	Henry Hays	Tom Smith	Brendon Burley
Roland Charneux	John Castelvechi	David Sutton	Guy Perreault
Carol Donovan	Karl Aveard	Mark Hydeman	Rob Chopowick
Kevin Gilkison	Nathan Ho	Kurt Rindoks	Bob Weidner
Eric Ballachey	Wade Conlan	Wenhong Xue	Brent Fullerton
Mathew Warren	Ben Alexander	Mary Foutz	Tim Wheeler
George Augustini	Wei Sun	Gary Shamshoian	Doug Ross

**Meeting Agenda/Notes:**

**Review goals of sub-committee**

- Goal is to have guide completed in three years and ready for publisher review
- As each chapter is completed it will be sent to the main committee for voting. Once the chapter is accepted it will be locked down for future publishing.
- Additional chapters will be added for review as previous chapters are completed in the order the sub-committee deems correct
- Chapter leads will have access to the authoring portal via ASHRAE and can include changes for that chapter with track changes so reviewers can see what has been updated.

**Permissions for images**

Permission is needed for all new images used in the guide. A Permission request form is available in the back of the authoring instructions. ASHRAE requests that we use the new form as it has a perpetual release that allows usage in future editions. Several previous images use will also require updated permissions. We will address them as we get to those chapters to see if they will still be used.

**Chapter Review**

**-Chapter 3 : Design Process**

- Limited edits and comments at this time.
- John Castelvechi and Karl Aveard have agreed to review.

We hope to have this chapter completed prior to Orlando so it may be sent to the main committee review.

**-Chapter 5: Exhaust Hoods**

- There are currently 3 versions of this chapter on the authoring portal which represent different points of view from various manufactures and the original un-edited version.

-Significant discussions surrounded the primary differences. Our goal is to combine the points of view and present a body of work that allows the reader to consider the various technologies and make a decision on what may be best for them.

-Since this is somewhat controversial topic we are trying to get a session in Orlando where the viewpoints can be presented.

#### *-Chapter 11: Controls*

-Several changes were made to include content for flammable cabinets and flow controls.

-Additional content is to be added for flow controls

#### **Call for additional volunteers to review**

If you are interested in reviewing the current chapters being edited, please send Ken Kuntz a note and you will be added to the authoring portal access. The following additional names have been sent to ASHRAE to request access to the portal. If you do not see your name and would like to support the effort, please let Ken know.

Wade Conlan, Brendan Dingman, Karl Aveard, Mike Amstadt, Doug Ross, Eric Ballachey

As we start to work on new chapters for editing, you may also add your name at that time.

#### **Additional chapters to start editing?**

We decided to hold off on starting officially editing more chapters, however those with access to the portal may begin reviewing and adding comments at any time.

#### **Smart Guide Content**

The smart guide at [www.ashrae.org/LabDG](http://www.ashrae.org/LabDG) contains additional content that cannot be placed in the printed version of the design guide.

This is an ideal location for videos, colored illustrations or photos.

While seminar and journal content can be placed here, it will be limited since these are currently for sale through ASHRAE.

If you have ideas for content please forward them to Ken Kuntz

#### **Running List of Additional Chapters or other content discussion**

-Potential re-arrangement of chapters

-O&M chapter harmonized with other ASHRAE publications

-How design guide applies to Z9.5 and where it applies

-discussion on air change rates and ventilation effectiveness (see additional chapter idea)

-Additional Chapter: Lab Classification-How to use, free download (smart guide)

-Additional Chapter: Exposure Control Devices      Tom Smith

-Additional Chapter: Ventilation Effectiveness      Kishor Khankari

-3D printing ventilation