M I N U T E S

TECHNICAL ACTIVITIES COMMITTEE

2023 Winter Meeting

February 4 & February 8, 2023

TABLE OF CONTENTS
TECHNICAL ACTIVITIES COMMITTEE
February 4 & February 8, 2023

PRINCIPAL MOTIONS
TECHNICAL ACTIVITIES COMMITTEE
February 4 & 8, 2023

No.	Motion	Status
1	that the TAC Reference Manual be changed as shown in **Attachment D.**	PASSED
2	that TAC recommends to Technology Council that the TAC MOP be changed as shown in **Attachment E**.	PASSED
3	that TAC change TC 1.13 scope:	PASSED
4	that TAC convert MTG.OBB to TC 7.10, Occupant *Behavior in Building Design and Operation*, with the following scope:	PASSED

ACTION ITEMS
TECHNICAL ACTIVITIES COMMITTEE
February 4 & 8, 2023

No.	Responsible Party	Action	Status
1	Staff	post link to hybrid meeting training to Basecamp & TAC website	
2	Metzger	Metzger agreed to manage this activity with goal of increasing TC membership from Chapter members.	
3	Staff	set up a page for FG meeting notices, develop the process and send info to FGs	
4	Staff	post updated TAC MOP and TAC reference manual to TAC website and Basecamp	
5	Mercer	Prepare list of questions for meeting with TFBD and send to Section Heads	
6	Mercer	Prepare training on 'How to run a meeting'	

LIST OF ATTACHMENTS

ATTACHMENT A: MTG.RES Resiliency Strategic Implementation
ATTACHMENT B: MTG.OBB request to convert TC 7.10
ATTACHMENT C: TC chairs breakfast agenda
ATTACHMENT D: TAC Reference Manual updates
ATTACHMENT E: TAC MOP updates
ATTACHMENT F: Communities Discussion
ATTACHMENT G: PEAC report

LIST OF ACRONYMS

AI	Action Item	PDH	Professional Development Hours
ASHRAE	American Society of Heating, Refrigerating and Air-conditioning Engineers	PEAC	Presidents Elect Advisory Committee
BOD	Board of Directors	RAST	Reactive Air and Surface Treatment
CEC	Conferences and Expositions Committee	RES	Resiliency
CTTC	Chapter Technology Transfer Committee	ROB	Rules of the Board
CNV	Chair Not Voting	SH	Section Head
DRSC	Document Review Subcommittee	TAC	Technical Activities Committee
Ex-O	Ex-Officio	TC	Technical Committee
FG	Functional Group	TFBD	Task Force for Building Decarbonization
IAQMD	Indoor Air Quality Measurement Devices	TG	Task Group
ISI	International Standards Interaction	TRG	Technical Resource Group
MBO	Management by Objectives		
MOP	Manual of Procedures		
MTG	Multi-disciplinary Task Group		
OBB	Occupant Behavior in Buildings		

M I N U T E S
TECHNICAL ACTIVITIES COMMITTEE
February 4 & 8, 2023

MEMBERS PRESENT:
Craig Messmer, *Chair*
James Bennett, *Vice Chair*
Corey Metzger, *Section 1*
Jon Cohen*, Section 2*
Tina Brueckner, *Sections 3 & 10*
Patrick Marks, *Section 4*
Kevin Marple, *Section 5*
Doug Reindl, *Section 6*
Satheesh Kulankara, *Section 7*
Charles Henck, S*ection 8*
Brad Cochran, *Section 9*
Kevin Mercer, *Training Coordinator*
Luke Leung, *BOD Ex-O*
Sarah Maston, *Coordinating Officer*

GUESTS:
Lionel Davis II
Tianzhen Hong
Luke Leung
Mariel Meegan
Ashish Rakheja, DRSC chair

ASHRAE STAFF:
Steve Hammerling, *MOTS*
Tara Thomas, *AA*

MEMBERS NOT PRESENT:
Dan Dettmers, *Section MTG*

MEMBERS RESIGNED:
Birol Kilkis
David Meredith

***

1. **Call to order**
   Chair Craig Messmer called TAC meeting to order at 8:20 AM EDT.

2. **Determine quorum**
   Staff confirmed quorum at the start of the meeting.

3. **Identify and welcome guests**
   Messmer welcomed all in the room and on virtual meeting room. Members, incoming members, and guests introduced themselves.

4. **Code of Ethics:**
   The chair reminded all *"we shall avoid all real or perceived conflicts of interests."*. With the recent CHANGES to the TC MOP requiring BALANCE for the voting membership we remove the appearance of bias and conflict of interest.

5. **Changes/approval of the agenda**
   Changes and edits to agenda would be made as they arise. The MTG.OBB chair would join shortly to address new TC proposal. A new item 12A would be added to discuss FG evaluation forms.

6. **Approve DRAFT minutes from TAC Meetings**
   Notes from TAC meetings 1-6 are posted to TAC Basecamp -
   https://3.basecamp.com/3106353/projects/389454

7. **Possible Motions**

   1. (Aute/Dettmers) TAC Motion to approve MTG.RES Resiliency Strategic Implementation plan (**Attachment A**)
      Aute has reached out and reported that leadership is in transition. New chair is Jason DeGraw who agreed to consider Aute's email and respond to TAC shortly. Can revisit Wednesday if there are updates.

   2. (Aute/Dettmers) TAC Motion MTG.OBB request to convert TC 7.10 **(Attachment B)**
      MTG chair Tianzhen Hong attended and asked TAC to consider the motion. They encouraged TAC to see not as overlaps but as synergies or opportunities and thanked for their support. Section Heads Cohen and Aute agreed to attend TC 2.1 meeting on Tuesday to request input and give them a chance to respond officially. TAC can then consider motion at Wednesday TAC meeting.

8. **(Messmer) TAC 22/23 Successes**
   1. TG9.SPACE approved
   2. Program Track Reviewers assigned. Program reviews completed.
   3. TC standards and handbook responsibilities posted to TAC basecamp and TAC/TC Leadership basecamp
   4. Hightower Award winner approved
   5. Published Journal article to generate interest in joining TCs (Smith and Constantinide)
   6. TAC arranged with staff to give training on hybrid meetings (Jan 24)
   7. New TG2.IAQMD
   8. Monthly TAC meetings. Winter Meeting is TAC #7
   9. More tbd as Winter Meeting progresses

9. **(Messmer) Old business / Action Items (Please be prepared to respond to below action items)**
   a. TC chair breakfast (Mercer/Messmer/Bennett/Reindl) – Draft agenda shown in **Attachment C.**

   b. Virtual Meeting training
      Hybrid meeting training was developed by Staff and held January 24th. There was great attendance. TAC members were interested to hear Wednesday how TCs did with virtual meetings after the training.

      A video of meeting is available. Staff was asked to post link to Basecamp & TAC website (**Action Item #1**).

   c. CTTC initiative
      Metzger agreed to manage this activity with goal of increasing TC membership from Chapter members. (**Action Item #2**).

   d. Interim FG meeting notification page
      TAC wished to model an FG meeting page after what standards does now at www.ashrae.org/technical-resources/standards-and-guidelines/project-committee-interim-meetings.

Staff would set up a page for FG meeting notices, develop the process and send info to FGs (**Action Item #3**).

e. (Bennett/Mercer) PDH credits for auto tutorials
Pushed to Atlanta meeting
- Bennett is awaiting update from Karen Murray (Kmurray@ashrae.org) and continues to work on this item.

f. (Staff/Satheesh/Vikrant/Marks) Electronic Roster Implementation
Hammerling reported that he and Thomas would be working with programmers to implement an electronic roster update tool and can coordinate with TAC volunteers.

g. (Marple/Marks/Messmer/Bennett/Staff) Review TAC MOP & Reference manual
Marple made changes to align the TAC MOP & Reference Manual with new FG MOP. All references to TC/TG/TRG were changed to FG.

(1) It was moved (Metzger) and seconded (Marks) that the TAC Reference Manual be changed as shown in **Attachment D.**

MOTION 1 VOTE: 12-0-0 CNV – PASSES

(2) It was moved (Reindl) and seconded (Cohen) that TAC recommend to Technology Council that the TAC MOP be changed as shown in **Attachment E**.

MOTION 2 VOTE: 12-0-0 CNV – PASSES

Staff would post updated documents to TAC website and Basecamp (**Action Item #4**).

h. (Messmer/Bennett/Hammerling) Status of TFBD liaison recommendations
- TFBD has full list of TC volunteers. Members from TCs are being invited to TFBD subcommittee meetings. Some requested liaisons (TC 6.3, section 9) are still missing from the liaison list. There will be a presentation from the TFBD chair at the TAC breakfast.
It was suggested that TAC invite Peterson and Leung to attend a future TAC meeting for a discussion of issues, concerns on list of publications and opportunities for FG participation. TAC could invite FG leadership as well.
Mercer to start list of questions for meeting w TFBD members to send to SH's to add to list **(Action Item #5).**

i. (Staff) Post TC standards and handbook responsibilities to TAC Basecamp
- Posted to TAC basecamp and TAC/TC Leadership basecamp
This action is complete.

j. (Kulankara) Activity Form / Section Head Reports status.
- Reports – New revision to add international member to tally report for Activity Form and Section Head report. Kulankara reminded all Section Heads to send the latest version to FGs. Sign in sheets should include new column to indicate international members as well.

k. (Messmer) FG Evaluation forms for Winter Meeting

l. Follow up with TC 1.6 (Meredith / Metzger)

6	ASHRAE should develop one set of aligned carbon definitions and terminology, and all standards should reference that document. Whenever possible, these definitions should align with globally accepted definitions that have already been developed.	June 2022	TFBD Tech Council / Standards Pub-Ed

m. ISI Task Group status. (Bennett)
Bennett thanked Doug Reindl for recruiting ISO standard review volunteers and Steve Hammerling for delivering the international membership excel sheet! ASHRAE is considering making this task group a standing committee with TAC VC as a member of this ISI group.

10. **(Leung) BOD Ex-O / (Maston) Coordinating Officer**
a. Section Communities
There was some discussion in TAC ExCom on moving from sections to 'communities' (**Attachment F**). TAC members asked for more time to review and consider strategies to achieve the stated goals of such a change.

b. BOD Ex-O PEAC report (move to Wed?)
Leung referred to PEAC report for inclusion in minutes (**Attachment G**).

11. **(Messmer) New Business**
a. Evaluation Form discussion – same form as last year
The same FG evaluation forms as last year will be used this year. TAC asked TC chairs to work with SH's on filling these out. SH's were asked for thoughts on what works well on form, what changes may be helpful.

12. **(Mercer/Marple) Training (10-minutes)**
a. Nothing for now.

13. **(Messmer) 2022-23 MBOs (6-minutes)**
MBO discussion - (https://public.3.basecamp.com/p/44duoY115YDx3ccRGFxRdKDt).
TAC would report updates to Operations Subcommittee.

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14. **TAC Part B - Call to order**
Chair Craig Messmer called TAC meeting to order at approximately 8:00 AM EDT.

15. **SECTION HEAD REPORTS (3 to 5 minutes per section)**

Focus on reports was on action items (motions). Information items would be included in the written reports.

Section 1:
(3) It was moved (Metzger) and seconded (Bennett) that TAC change TC 1.13 scope:

TC 1.13 Optimization *is concerned with identifying, developing and disseminating optimization techniques that enhance the performance of HVAC&R components, systems and building systems*

that are not application or tool specific. The committee is focused on the fundamentals of optimization techniques (such as: mathematical formulation, constraints handling, multi-objective optimization, approximation techniques,~~ ~~and robust optimization. <u>These fundamentals are the foundation of data driven, machine learning, and artificial intelligence methods).</u> ~~etc~~).

MOTION 3 VOTE: 12-0-0 CNV – PASSES

<u>Section 2:</u>
The 2021 George B. Hightower Technical Achievement Award was awarded to winner Gemma Kerr at the TAC Training Breakfast and in her TC 2.4 meeting.

(4) It was moved (Cohen) and seconded (Aute) that TAC convert MTG.OBB to TC 7.10, Occupant *Behavior in Building Design and Operation*, with the following scope:

Technical Committee 07.10 is concerned with understanding the building occupant's behavior and interactions with building energy and control systems; including the development, study, and validation of building modes of operation, operation methods, and measurement and control tools; to positively impact occupant indoor environmental quality, health, productivity, and building energy consumption.

BACKGROUND: MTG.OBB would be disbanded. TC 2.1 was OK with proposal and was developing scope changes of their own.

MOTION 4 VOTE: 12-0-0 CNV – PASSES

<u>Section 5:</u>
The 2022 George B. Hightower Technical Achievement Award was awarded to winner John Constantinide at the TAC Training Breakfast and in the TC 5.2 meeting.

<u>Section 6:</u>
Noted there was some discussion of manufacturers reconsidering support of employers on benefit of ASHRAE participation related to TFBD issues.

There is some discussion in TC 6.10 (Fuels and Combustion) on a possible name change but they're not ready to change now.

<u>Section 7:</u>
Noted TCs 7.1 and 7.4 may needs some help with leadership and membership.

There were questions on if a TC could use sharepoint vs. basecamp – should TAC have a policy on requirements to use Basecamp. It was noted that ASHRAE supports Basecamp and wouldn't support sharepoint, so TAC should consider if we are insisting on Basecamp or not.

<u>Section 8</u>
Training on 'how to chair/conduct a meeting' or 'how to run a successful meeting' (not limited to TCs) may be helpful as well.

Mercer agreed to help develop this training for FGs (**Action Item #6**). CEC may be able to help as professional development program for inclusion in Tampa program. This training could be made available a month before the meeting then again at the meeting.

Section 9
TC 9.12 considering a title change to align with CTBUH standard on definition of tall buildings. In discussion for now.

Cochran noted the TC 9.10 roster is incorrect. Thomas will help to resolve.

TG9.SPACE held their first face to face meeting in Atlanta and was really well attended.

Section 10:
TC 8.9 was to merged with TC 10.6. TC 10.6 is asking what standards or handbooks or research TC 8.9 was involved or cognizant for so the new TC can take these on.

Section MTG:
Aute noted he has taken on all 12 MTGs as liaison. He should be added to roster for all.

Noted there is a new chair for MTG.RES (Jason DeGraw).

Also, MTGs are looking for websites. There is a dedicated page currently, but not like TC webpages. MTG would need a webmaster to administer if they were to get websites. TAC agreed to review to next TAC discussion.

General comments:
- Sections reported generally that many TCs did not have enough space.
- Some reported a wireless mic in room to pass around really worked well for hybrid meetings
- Section Heads were asked to recommend successful FG chairs to participate on TAC
- TCs are asking for reasons for program rejections. Metzger suggested they reach out to technical chair for meeting, or the chair or vice chair of CEC
- It was noted the agenda template for FGs should include current code of ethics statement. There are numerous versions out there being used
- Some TCs wished to revert to pre pandemic time slots for meetings if possible

16. **New Business**
Due to resignations TAC will need members for this current Society Year as well as new TAC members for next year. Members were asked to send possible candidates to Leung as soon as possible.

17. **Next Meeting**

    a. Monthly TAC meeting in March t.b.d.

    b. ASHRAE Annual Conference – June 24 & 28, 2023 – Tampa, FL

18. **Adjournment**
The TAC meeting adjourned at approximately 10 AM EDT.

ASHRAE

Roadmap to Resilience

Resilient buildings and communities is one of four major goals of the ASHRAE 2019-2024 Strategic Plan. While resilience has become a hot topic among both the public and the engineering community, specific guidance on how to achieve resilience is generally not available. There is great interest within ASHRAE to work to improve resilience in the built environment but given the breadth of the resilience concept there is a need to prioritize activities and direct the overall effort towards specific goals. This document provides a roadmap for implementing specific measures within ASHRAE to incorporate resilience concepts across its many activities.

> ## Overall Goal:
> ## Position ASHRAE as the worldwide leader in HVACR resilience.

Background

Resilience, as defined in the ASHRAE and CIBSE Position Document on Resiliency in the Built Environment is the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events.

The ability to absorb adverse events involves identifying the hazards, setting appropriate design levels, and designing to achieve a specified performance when subjected to the hazards. In the past the design typically followed a prescriptive approach where both the hazard and the design requirements are required by standards, codes, etc. Performance based design, where the owner and designer have more flexibility in terms of the design requirements has been gaining in acceptance, but attempts to achieve enhanced resilience are often met with resistance since they go beyond simple code compliance.

Preparing and planning for hazards have been dictated, to a large extent, by using hazards and design levels specified in codes and standards. These hazard levels have traditionally been based on historical data, but efforts are underway to consider future effects such as climate change when determining design levels over the life of a project.

Considering recovery after an event is a relatively new concept for most designers. Since designing for no damage under any circumstances is not realistic, if we want a resilient building we must

determine acceptable levels of damage, including how a building should be used after an event, and the resulting requirements for functionality from the building systems. This is the main goal of designing for enhanced resilience – determining the requirements and designing to ensure the building delivers that performance with an acceptable time and cost of repairs.

Sustainability and Resilience

Sustainability and resilience are often conflated in discussions, even though the concepts are separate and sometimes in conflict. Some components of sustainability, such as energy efficiency, may lead to improved resilience, while others might make a building less functional if there is a loss of power or water. Further, for some buildings, such as emergency response shelters or hospitals, resilience is of primary importance, although the goal is to design for maximum sustainability within the functionality restrictions imposed by the intended use.

Roadmap Overview

The activities that ASHRAE will undertake to advance the overall goal of worldwide leadership in HVACR resilience can be divided into three broad conceptual categories: Coordinate, Develop, and Propagate. Each category consists of specific activities that ASHRAE will undertake, which are further characterized into the groups of Technical, Education, and Research.

Coordinate: Achieving true resilience in the built environment requires that all the pieces work together. Coordinating ASHRAE resilience-related activities will not only ensure that the developed products lead to truly resilient designs, but also that ASHRAE resources are used in a manner that advances resilience, eliminates duplication, and provides cost-effective benefits to the membership and society at large. The requirement for cost-effectiveness of ASHRAE efforts involve not only monetary investments, but also the most valuable of resources – the time and energy of the members. Coordination also involves working with other technical societies and governmental and academic institutions.

Develop: Standards, guidelines, user manuals, operation guides, educational guides and programs, etc. are the means by which ASHRAE technical expertise is documented and utilized. It is crucial that ASHRAE be the source of this information rather than letting others dictate how our members design HVACR systems. However, as ASHRAE moves towards development of resilience-related materials these efforts must be coordinated to ensure a holistic approach and disseminated to enhance their reach.

Propagate: ASHRAE can develop forward thinking resilience materials, but unless these materials are disseminated they are of limited use. Dissemination includes making the material available to both the technical and policy communities, but also provision of education on their application.

> *Technical*: Technical activities will be the backbone of ASHRAEs efforts regarding resilience. Without a strong, scientifically based technical framework the drive to produce more resilient buildings will eventually dissipate.

Education: Educating ASHRAE members and others on resilience in HVACR systems is essential to successful implementation of increased resilience in design, and also for continued support of ASHRAE activities regarding resilience.

Research: There is clearly a need for research into improving resilience in HVACR systems. However, it is not currently apparent which topics will provide the most return on investment to ASHRAE and its members.

ASHRAE Activities to Promote Enhanced Resilience				
Category	Group	Activity	Priority	Time Frame
Coordinate	Technical	C1: Develop overarching resilience technical goals	High	Short
	Technical	C2: Provide guidance to TCs and other groups	High	Medium
	Education	C3: Convene resilience meeting coordination	Mid	Short
	Research	C4: Convene resilience research coordination	Mid	Short
Develop	Technical	D1: Standard development	Mid	Medium
	Technical	D2: Guideline development	Mid	Medium
	Technical	D3: Other technical development	Mid	Long
	Technical	D4: Resilience webinar series	Mid	Short
	Education	D5: How-to guides	Mid	Long
	Research	D6: Research proposal guidance	Mid	Medium
Propagate	Technical	P1: Incorporate ASHRAE products	High	Long/Continuing
	Education	P2: Resilience webinar series	Mid	Short
	Education	P3: Short courses	Low	Long
	Education	P4: Support ASHRAE outreach	Mid	Medium
	Research	P5: Collect research ideas	High	Short

Activity Descriptions

Coordinate

C1: Develop overarching resilience technical goals: Work closely within ASHRAE with all appropriate TCs and groups external to ASHRAE to develop overarching resilience goals and guidance. It is expected that the Resilience MTG will perform this role, in conjunction with Tech Council.

C2: Provide guidance to TCs and other groups: Provide guidance and oversight to TCs and other groups within ASHRAE to ensure that their products are consistent with the overall resilience roadmap. A new group may be required to perform this activity

C3: Convene resilience meeting coordination: A dedicated group will be established to evaluate resilience-related conference proposals to ensure that they actually address resilience, and in a way that is consistent with ASHRAE policies on resilience. Too many programs reference the hot term of the moment but have little actual relation to the topic.

C4: Convene resilience research coordination: Set up a group within RAC to specifically evaluate resilience related research proposals for both technical excellence and how they fit into the overall ASHRAE resilience roadmap. This group would also ensure that the project is suitable for ASHRAE funding, and not more appropriate for basic science funding agencies such as NSF or DOE.

Develop

D1: Standard development: Develop standards that can be adopted into the building code to promote more resilient designs. These standards must be designed to work together to produce truly resilient buildings rather than a series of individual unrelated systems.

D2: Guideline development: Develop design guides, user manuals for commissioning, etc. to support the standards activities and promoter wider use amongst the design community.

D3: Other technical development: Develop, as appropriate, handbook chapters, software, models, sequence of operations, and other advanced tools to assist designers looking to enhance resilience in their projects.

D4: How-To Guides: Development of "how-to" guides either stand alone or supporting other standards and guidelines. See, for example, the ASHRAE Datacenter short guide books.

D5: Research proposal guidance: Develop guidelines for TCs to use in determining what information is missing that will advance their efforts to develop technical information on resilience. This guideline could include a checklist of items to be considered when evaluating a resilience research topic/proposal. Of particular importance is supporting standard, guideline, and handbook chapter development since these items are of the most use to ASHRAE members.

Propagate

P1: Incorporate ASHRAE products: Work to integrate ASHRAE's technical documents into the building code, rating systems, and other building design projects globally.

P2: Resilience webinar series: A dedicated resilience webinar series to provide general information on resilience to ASHRAE members would include topics such as what is resilience, how it affects/will affect design practice, how building resilience impacts communities, and updates on activities within ASHRAE. Ideally these webinars would be free to members to encourage attendance and member involvement in ongoing activities.

P3: Short courses: ASHRAE short courses related to technical documents as they are developed. The short courses should be available online and/or in-person at every ASHRAE winter and summer meeting.

P4: Support ASHRAE outreach: Active support of presenting ASHRAE resilience initiatives to other audiences such as government officials, building owners/developers, architects, etc.

P5: Collect research ideas: Use ASHRAE publications and meetings to solicit input regarding resilience research priorities. Develop an ASHRAE "Think Tank" regarding resilience, and hold a workshop(s) to collect research priorities. Allow the general membership a voice in identifying those areas most in need of new information.

Resource Commitments

Money - research, webinar development, coordination travel, workshops, etc.

Staff

Space - slot at meetings? meeting space, etc.

Occupant Behavior in Building Design and Operation
Proposal for A New Technical Committee 07.10

Tianzhen Hong, PhD, PE, FASHRAE

On behalf of MTG.OBB

Original: March 12, 2018;

Revised: June 15, 2018; December 6, 2018; June 18, 2019; July 2020; December 2020; Final June 2021; January 2022; January 2023.

Background

Occupant behavior has strong influence on building energy use and occupant comfort, but it is less understood and usually oversimplified in the building design and operation. Understanding dynamic and diverse occupant comfort needs as well as occupant interactions with building systems is therefore crucial to ensuring that building design and operations meet energy performance goals while providing healthy and productive living and working environments.

MTG.OBB was officially approved by ASHRAE at the January 2016 Orlando Winter Meeting. Kick-off teleconference was held on May 2, 2016. MTG members have been meeting in person twice a year during ASHRAE conferences since the St. Louis meeting in June 2016. Currently MTG.OBB has 12 active supporting TCs, 17 voting members and 6 non-quorum voting members.

As ASHRAE's MTGs are temporary working groups on special topics that usually disband after two to three years, members of the MTG.OBB voted in June 2018 to convert the MTG.OBB to a technical committee based on the fact that the MTG.OBB has been functioning as a technical committee, with the on-going research, program and contributions to ASHRAE publications. We feel this MTG would fall in Technical Section 7.0 Building Performance. A potential number is TC 07.10 Occupant Behavior in Building Design and Operation.

MTG.OBB has been active in three areas: (1) seminars: proposing and sponsoring a series of seminars on occupant behavior in buildings, (2) research: two research projects, one work statement and three RTARs were developed, and (3) publications: contribution to Chapter 19 of 2017 and 2021 Fundamental Handbook, Chapter 13 Smart Building Systems for the Green Guide 4th Edition, a new chapter 65 for the 2019 HVAC Applications Handbook and revision for the 2023 HVAC Applications Handbook. Details are as follows.

Research

- **Project 1815**: Integrating occupant behavior data into building information models for performance simulation. Three rounds of revisions were made to the work statement to incorporate suggestions from reviewers, RAC, and research liaison. RP 1815 is co-sponsored by four committees: TC 4.7, TC 7.6, TC 1.5, and MTG.BIM, demonstrating strong interest in the proposed research from the ASHRAE community. The project is making good progress.
- **Project 1883**: Development of the ASHRAE Global Occupant Database. This project was proposed and monitored by MTG.OBB. It was completed in June 2022. Curated occupant datasets were published at the website, https://ashraeobdatabase.com/. The project report was reviewed and approved by the PMS and MTG.OBB at the February 2022 meeting. Two journal articles were developed and under review.
- **Work Statement 1811 (**co-sponsor with TC 1.5): Determining occupancy patterns in clusters of buildings with data drawn from web-based social media. Authors are revising the WS to address reviewers' comments. The plan is to submit the updated WS for RAC review at the next meeting (June 2022).
- **RTAR 1870:** Investigating Occupant Energy Behavior and Building-Human Interaction in Office Buildings.
- **RTAR new** (co-sponsor with TC 2.8): Residential water fixture use schedules based on occupant behavior.
- **RTAR new** (co-sponsor with TC 7.5): Occupancy-Aware Control and Operation of HVAC Systems in Commercial Buildings.

Program – Seminars (22 + 2)

- **St Louis** January 2017 one conference paper session: Occupant Predictions and Thermal Comfort
- **Las Vegas** June 2017 one seminar: Occupant Behavior Driven Building Operation and Maintenance
- **Long Beach** January 2018 three seminars: Interdisciplinary occupant behavior survey; occupant-based model predictive control; using nature and keeping control
- **Houston** June 2018 two seminars: outcomes from Annex 66; technology adoption modeling

- **Atlanta** January 2019 two seminars: Occupant-centric Control Technologies: Assessing Comfort, Energy Use, and Cost Tradeoffs; Practical Aspects of Incorporating Occupant Considerations into Building Design and Operations
- **Kansas** June 2019 two seminars: Occupant Behavior Analysis and Application Based on Large-Scale Datasets, Occupant-Centric Building Design and Operation: State of the Art and Challenges
- **Orlando** February 2020 two seminars: Occupant-Centric Building Design and Operation: State of the Art and Challenges-Part II; Overview of the new chapter in 2019 HVAC Applications Handbook: Occupant-centric sensing and controls
- **Virtual/Austin** June/July 2020 one seminar: Occupant-centric building design and operation: Implementation case studies
- **Virtual/Chicago** February 2021 one seminar and one panel: Advancing occupant aspects of building energy codes, standards, and policy; Impact of COVID-19 on Building Energy Consumption, IAQ and Occupant Behavior
- **Phoenix** June 2021 two seminars: Occupant information modeling; Occupant centric performance metrics.
- **Toronto** June 2022 two seminars: building operator survey results and findings; ASHRAE Global Occupant Behavior Database.
- **Atlanta** February 2023 two seminars: Human aspects in building decarbonization; Brace for It: The Impact of Building Occupants on Building Operations, Maintenance & Performance
- **Tampa** June 2023 two seminar proposals: ASHRAE Global Occupant Behavior Database; Occupant-centric design case studies

Publications

- Guideline 45P Performance measurement protocol for commercial buildings. MTG.OBB members Bing Dong and Liam O'Brien are developing content on occupant sensing and measurements, which will be reviewed by MTG.OBB at the next meeting.
- 2023 HVAC Applications Handbook, revision to chapter 65, Occupant-centric sensing and control, was completed and approved for submission to ASHRAE Handbook liaison.
- 2021 Fundamentals Handbook, an extended section on occupant modeling for Chapter 19
- 2017 Fundamentals Handbook, a new section of Occupant Behavior, under the Inputs to Loads Models of Chapter 19 Energy Estimating and Modeling Methods
- 2019 HVAC Applications Handbook, a new chapter 65, Occupant-centric sensing and control
- Green Guide 4th Edition, updated Chapter 13 Smart Building Systems

Description of the Proposed Technical Committee 07.10: Occupant Behavior in Building Design and Operation

Scope of TC

Technical Committee 07.10 is concerned with developing data, methods, tools and case studies to improve understanding of occupant behavior in building design and operation, and meeting individual needs of indoor environmental quality (IAQ, thermal, visual and acoustic comfort), health, productivity, as well as improving occupant interactions with building energy and control systems to reduce energy use and peak demand in buildings.

Purpose of TC

Occupant behavior is one of the key factors influencing energy and comfort performance of buildings. However, occupant behavior, due to its complexity, diversity and stochasticity, is less understood and oversimplified in the building design and operation. TC 07.10 will propose and conduct research projects to (1) collect and develop data of occupant behavior in buildings, (2) develop and evaluate occupant behavior models that can be used in building performance simulation, and (3) conduct case studies to demonstrate applications of integrating occupant behavior to improve building design and operation.

TC 07.10 has three specialized subcommittees: Research, Program, and Interdisciplinary. The research and program subcommittees are similar to those of other TCs, while the interdisciplinary subcommittee is unique. The interdisciplinary subcommittee will integrate social and behavioral sciences with building science and HVACR engineering, aiming to: (1) understand occupants' attitudes, concerns, energy usage habits, and energy efficiency potential from the interconnection of social and technological perspectives, (2) advance research in energy efficiency behaviors by integrating the disciplines of mechanical engineering, building physics, sociology, psychology, architecture and beyond, and (3) provide insights for government, policy makers, utility companies, building planners, and researchers in improving energy efficiency and building designs; which lead to a better connected smart community.

TC 07.10 will collaborate with several TCs on occupants related research and activities and to avoid any overlapping scope, including, TC 1.4 Control Theory and Application, TC 2.1 Physiology and Human Environment, TC 4.3 Ventilation Requirements and Infiltration, TC 4.7 Energy Calculations, TC 4.10 Indoor Environmental Monitoring, TC 7.1 Integrated Building Design, TC 7.3 Operation and Maintenance Management, and TC 7.5 Smart Building Systems. These are supporting TCs for the MTG.OBB.

TC 07.10 will collaborate with Annex 79 (2018-2023) "Occupant behavior-centric building design and operation" under the International Energy Agency's Energy in Buildings and Communities Programme.

Program Plan

TC 07.10 will propose and sponsor seminars for ASHRAE conferences focusing on occupant behavior data collection and modeling and simulation to inform building design and operation. Joint sponsorship of seminars with other TCs is encouraged. Information about the future technical program is discussed at each TC meeting and at the TC's Program Subcommittee meeting. There are two seminar proposals from MTG.OBB for each ASHRAE confernece since 2016.

For the Atlanta conference in January 2019, there are two seminars proposed and sponsored by MTG.OBB: Occupant-centric Control Technologies: Assessing Comfort, Energy Use, and Cost Tradeoffs, jointly sponsored by TC 1.4 and TC 7.5; and Practical Aspects of Incorporating Occupant Considerations into Building Design and Operations.

For the Kansas City conference in June 2019, there are two seminars proposed and sponsored by MTG.OBB: Occupant Behavior Analysis and Application Based on Large-Scale Datasets; Occupant-Centric Building Design and Operation: State of the Art and Challenges.

For the Orlando conference in February 2020, there are two seminars proposed and sponsored by MTG.OBB: Occupant-Centric Building Design and Operation: State of the Art and Challenges-Part II; Overview of the new chapter in 2019 HVAC Applications Handbook: Occupant-centric sensing and controls.

For the virtual conference in June/July 2020, there are two seminars proposed and sponsored by MTG.OBB: Occupant-centric building design and operation: Implementation case studies; Future Smart Building Operations for Load Flexibility.

For the virtual conference in January 2021, there are two seminars proposed and sponsored by MTG.OBB: Advancing occupant aspects of building energy codes, standards, and policy; Impact of COVID-19 on Building Energy Consumption, IAQ and Occupant Behavior.

For the virtual conference in June 2021, there are two seminars proposed and sponsored by MTG.OBB: Occupant information modeling; Occupant centric performance metrics.

For the Toronto conference in June 2022, there are two seminars proposed and sponsored by MTG.OBB: Building operator surveys and findings; ASHRAE Global Occupant Behavior Database.

For the Atlanta conference in February 2023, there are two seminars proposed and sponsored by MTG.OBB: Human aspects in building decarbonization; Brace for It: The Impact of Building Occupants on Building Operations, Maintenance & Performance.

Research Plan

TC 07.10 will identify research topics, propose research projects, select bidders, and monitor research projects funded by ASHRAE. Information about their specific research program is discussed at each TC meeting and at the TC's Research Subcommittee meeting. Three research areas are summarized as follows.

Occupant behavior data collection

Research projects will be proposed to collect large-scale occupant behavior data in residential and commercial buildings, through monitoring and measurement of occupant activities in buildings, as well as questionnaire survey of occupants in buildings. Ethic issues and privacy issues will be addressed before data collection. The collected occupant behavior data is the foundation of understanding occupant behavior in buildings, and development and validation of occupant behavior models.

Occupant behavior modeling and simulation

Built upon the collected occupant behavior data, new occupant behavior models will be developed and existing models will be evaluated. These occupant behavior models will be applied to building performance simulation to inform building design and operation. The research outcomes will feed into TC 4.7 to improve consideration of occupant behavior in energy calculations in buildings.

Occupant-centric sensing and controls

Occupants live and work in buildings for 90% of their time. Understanding their dynamic and diverse comfort needs and their interactions with building systems is crucial to ensuring building design and operations meet energy performance goals while providing healthy and productive living and working environments. Although occupancy sensing and related controls have increasingly been integrated into HVAC system operations, more holistic, systems-based approaches are needed for integrating information about the human presence, comfort, and adaptive actions into the building controls loop using smart sensing technologies, IoT, AI, and big data. Inter-disciplinary approaches will be developed and applied to the design and operation of HVAC systems that link occupants with control strategies, aiming to reduce energy use in buildings and improve occupant comfort.

On-going activities

TC 07.10 completed the research project 1883, development of the ASHRAE Global Occupant Database.

TC 07.10 is making progress in the on-going research project, Work Statements and RTARs listed as follows.

- **RP 1815:** Integrating occupant behavior data into building information models for performance simulation
- **WS 1811:** Determining occupancy patterns in clusters of buildings with data drawn from web-based social media
- **RTAR 1870:** Investigating Occupant Energy Behavior and Building-Human Interaction in Office Buildings
- **RTAR new** (co-sponsor with TC 2.8): Residential water fixture use schedules based on occupant behavior
- **RTAR new** (co-sponsor with TC 7.5): Occupancy-Aware Control and Operation of HVAC Systems in Commercial Buildings

Standards Activities

TC 07.10 will contribute to the development of several ASHRAE standards: 55, 62.1, 62.2, 90.1, 90.2, 189.1, and 100. Improved occupant behavior data and models can be applied to the development of these standards to capture the impact of occupant behaviors on building performance. TC 07.10 will establish communication with the related standard committees.

Handbook

TC 07.10 will be responsible for chapter 65, Occupant-centric sensing and controls, originally developed by MTG.OBB for 2019 HVAC Applications Volume. This chapter discusses inter-disciplinary approaches to the design and operation of HVAC systems that link occupants with control strategies, aiming to reduce energy use in buildings and improve occupant comfort. Focuses are on: (1) collecting real-time occupancy and comfort feedback, (2) integrating occupant feedback into HVAC control schemes, and (3) modeling occupant-centric HVAC control systems. Revisions for the 2023 HVAC Applications Volume are under development.

MTG.OBB also developed a new section on occupant modeling for Chapter 19 of the 2021 ASHRAE Fundamentals Handbook.

Other ASHRAE Publications

TC 07.10 will continue contributing to the revision of the Green Guide, Chapter 13 Smart Building Systems.

Proposed TC 07.10 Membership (based on current MTG.OBB membership)

Name	Affiliation	Membership	Representing TC/SPC/MTG
Tianzhen Hong	LBNL	Chair, VM	
Da Yan	Tsinghua University, China	Vice Chair, VM	

Jared Langevin	LBNL	NVM, Secretary and Program Subcommittee Chair	
Marina Sofos	DOE	VM	BTO Sensor and Controls Program
Thomas Lawrence	University of Georgia	VM	TC 2.8
Jeff Haberl	TAMU	VM	TC 4.7
Bing Dong	Syracuse University	VM, Research Subcommittee Chair	TC 7.5
Rob Hitchcock		VM	MTG.BIM
Michael Jouaneh	Lutron	VM	SSPC 189.1
Zheng O'Neill	University of Alabama	VM	
Sammy Meleika	NREL	VM	
Mini Malhotra	ORNL	VM	TC 4.3
Douglass Abramson		VM	TC 9.2
Kimberly Barker	Siemens	VM	TC 1.4
Frederick Marks	Salk Institute	VM	SGPC 10
Marianne Touchie	University of Toronto	VM	TC 2.1
Chien-fei Chen	University of Tennessee	VMNQ, Interdisciplinary Subcommittee Chair	
Clinton Andrews	Rutgers University	VMNQ	
Mark Zoeteman	FTCH	NVM	TC 4.7
William Bahnfleth	Penn State University	NVM	TC 4.7
Gary Klein	GKA	NVM	TC 6.6
Richard Danks		NVM	TC 7.3
Mudit Saxena		NVM	MTG.BIM
Ed Arens	UC Berkeley	NVM	SSPC 55

Don Horn		NVM	SSPC 189.1
Michel Tardif	NRCan/RNCan, Canada	NVM	TC 7.1
John Elson	Kansas State University	NVM	TC 2.1
Bew Schoenbaver	CFE	NVM	TC 6.6
Dan Dettmers	Quest Climate	NVM	MTG Section Head
Gang Tang	University of Wyoming	NVM	TC 4.10
Rune Korsholm Andersen	Technical University of Denmark	NVM	

TC/TRG/MTG Chair Breakfast Meeting

Sunday, February 4, 2023, 7am-9am

Draft Agenda (1/10/23)

Liaisons are still being confirmed so times are tentative.

1. Intro (Mercer) – 4 min
2. Activity forms (Satheesh) – 10 min
3. Roster update process (Tara) – 10 min
4. Hybrid meeting best practice (Mercer) – 5 min
5. Leadership training (Mercer) – 5 min
6. MOP changes (Marple) – 10 min
7. Evaluation form (Messmer) – 8 min
8. HighTower award announcement (Messmer) – 3 min ask John Constantinide. to stop by.
9. Liaisons
    a. RAC (Omar Abdelaziz) – 5 min
    b. CEC (Christine Reinders) – 5 min
    c. TFBD (Kent Peterson) – 8 min
    d. GAC (Darryl Boyce/Alice Yates) – 5 min
    e. REF-CPCC (Dustin Lilva) – 5 min
    f. RBC (Bill Healy) – 5 min
    g. EHC (Nick Clements) – 8 min
    h. Standards (Susanna Hanson) – 5 min
    i. ISI (Bennett) – 8 min
    j. Tech Council (Sarah Maston) – 8 min
10. Wrap up (Messmer) - 3 min

REFERENCE MANUAL

FOR

TECHNICAL ACTIVITIES COMMITTEE

REVISED: 12/11/2017

FOREWORD

The Technical Activities Committee (TAC) is a General Standing Committee of the Society and operates under the direction of the Board of Directors and Technology Council. The Rules of the Board ROB) for the Technical Activities Committee are the constitution of the committee. Proposed changes to the ROB and their appendices must be approved by the Board of Directors.

This Reference Manual is a supplement to the TAC MOP and describes in detail the methods and procedures by which the committee accomplishes the duties and responsibilities assigned to it. The Reference Manual is an internal document of the committee for its own guidance and is maintained as described in the TAC MOP.

YOUR COMMENTS ARE WELCOME

Submit comments or suggestions about this document electronically to the ASHRAE Manager of Research and Technical Services (MORTS).

E-mail: MORTS@ashrae.net

The MORTS will consolidate comments for TAC. TAC intends to maintain this Reference Manual as a "living document" and update it as it is needed and practical.

RECENT REVISIONS

12/11/2017   Updated to reflect the latest TAC Coordinator Positions and Responsibilities

TABLE OF CONTENTS

CHAIR AND VICE CHAIR

1. Chair Responsibilities

    1.1. Preside over all meetings of TAC and the TAC Executive Committee.

        1.1.1. Responsible for the preparation of agendas for meetings of TAC and the TAC Executive Committee with the advice of the Manager of Research and Technical Services and TAC members.

        1.1.2. Responsible for ensuring that the Manager of Research and Technical Services provides minutes of the meetings of TAC and the TAC Executive Committee within 30 days of the meetings.

        1.1.3. Ensure that all draft minutes distributed by TAC include the following notice on the bottom of the cover page: "These draft minutes have not been approved and are not the official, approved record until approved by this committee."

    1.2. Appoint committee Chairs as detailed in the FG ~~TC/TG/TRG/~~ and MTG Manual of Procedures

        1.2.1. MTGs are expected to have a finite term within which to complete their assigned task. MTG Chairs and Vice Chairs are reappointed each year and there is no limit on the consecutive terms served, but the reappointment should only be made if it serves the best interest of the Society and the member is willing to serve.

        1.2.2. Voting members of an MTG shall be reappointed each year if willing to serve and endorsed by the chair/leader of the ~~TC~~ FG or non-~~TC~~ FG group they represent, and there is no limit on the consecutive terms served. The reappointment, however, should only be made if it serves the best interest of the Society and the ~~TC~~ FG or non-~~TC~~ FG group represented.

    1.3. With the assistance of the Manager of Research and Technical Services, the Chair prepares and submits to the Technology Council and the Board of Directors, through the Executive Vice President, a semi-annual report, an annual report, and such other reports as are required to be submitted to the Board.

        1.3.1. The Chair submits a written or an oral report at the fall meeting of Technology Council.

    1.4. The Chair is responsible for providing information to Society members to publicize the activities of the Technical Committees, Task Groups, Multidisciplinary Task Group, and Technical Resource Groups; and other items of current significant interest concerning the operation of TAC. The chair normally works with the MORTS to prepare and distribute relevant information. This is done at least 2 times per year in advance of the winter and annual meetings.

    A status report on the objectives is included in the semi-annual report submitted to the Technology Council at the Society Winter meeting. A final report of the objectives is included in the annual report submitted to the Technology Council at the Society Annual meeting.

Commented [KM1]: Changed formatting to reflect "FG" vs. TC/TG/TRG throughout the document - typical.

Commented [KM2]: Confirm with current MTG MOP

    1.5.   Thank retiring TC/TG/TRG/MTG Chairs for their services.

2. <u>Vice Chair Responsibilities</u>

    2.1.   Responsible for seeing that the budget of TAC is prepared. Details of the budgeting process are in **Appendix C** (Calendar/Process for Budget/Four-Year Plan) of the <u>Technology Council MOP</u>.

        2.1.1.   Periodically, the Vice Chair reviews, with the Manager of Research and Technical Services, expenditures and budget allocations and takes any action deemed necessary, in cooperation with the Executive Vice President and the director of Technology, to stay within the established budget.

    2.2.   Appoint mentors for all incoming TAC members and oversee the mentoring of new members according to the guidelines given in **Appendix A**.

    2.3.   No later than 30 days prior to the Annual and Winter Society meetings, prepare and distribute a draft list of reminders about upcoming activity deadlines and deliverables to Section Heads to edit and then distribute to ~~TC, TG, MTG~~ FG, and ~~TR~~MTG Chairs.

    2.4.   Within 30 days after the Annual and Winter Society meetings, with assistance from Section Heads and TAC ExCom, prepares and distributes a TC Activities Summary Report to TAC members.

    2.5.   Perform other duties that may be assigned by the Chair.

    2.6.   Prior to the Society Annual meeting, prepare objectives for the committee for the next year using the format given in **Appendix B** and present these objectives to TAC for review and approval at the Society Annual meeting.

        2.6.1.   Each objective should be measurable and should include a projected completion date, fiscal impact, and ~~other information that would clarify the intent of the objective~~ aligned with the current ASHRAE Strategic Plan and the specific Initatives.

        2.6.2.   The objectives will be included in the TAC annual report to the Technology Council at the Society Annual meeting as an information item, and a copy of the objectives will be sent to headquarters staff (Assistant to the BOD).

        2.6.3.   Staff (Assistant to the BOD) will send copies of objectives to the BOD Ex Officio, TAC staff liaison and Technology Council staff liaison. Staff liaisons will send objectives to TAC and Technology Council members.

EXECUTIVE COMMITTEE (TAC EXCOM)

3. Membership

   3.1. The members of the Technical Activities Executive Committee are detailed in the TAC MOP.

   3.2. The following Ex-Officio members of the Technical Activities Executive Committee may participate in the discussions but are not eligible to vote:

      3.2.1. Manager of Research and Technical Services (MORTS)

      3.2.2. Director of Technology

      3.2.3. Board Ex Officio

      3.2.4. Coordinating Officer

4. Meetings

   4.1. The Technical Activities Executive Committee meets before the first scheduled meetings of TAC at the Annual and Winter Meetings of the Society.

      4.1.1. The Chair determines the time of meeting with consideration for the responsibilities and convenience of the members.

      4.1.2. The meeting may be held at the same location as the meeting of TAC or may be an electronic meeting held prior at the discretion of the Chair.

   4.2. Executive Committee meetings are open to all members of TAC, all Society members, all registered guests at scheduled Society meetings, and those invited by the Chair and subject to Robert's Rules of Order. If an official 'Executive Session' is required, only members of the Executive Committee are allowed in the meeting and all others shall be asked to leave by the Chair for the duration of that portion of the meeting.

   4.3. Meetings of the TAC Executive Committee are called by the Chair whenever appropriate to conduct the business of the committee between the winter and annual meetings.

      4.3.1. Special face-to-face meetings of ExCom involving travel require approval from the President or the committee's Coordinating Officer when, in their opinion, an urgent action is required.

      4.3.2. The Chair designates the time and place of special meetings in coordination with MORTS.

      4.3.3. The Chair should consider 'wrap-up' meetings within 30 days of the winter and annual meetings to review the assigned action items and issues that need immediate attention.

   4.4. The Chair is responsible for ensuring that a written notice of a meeting is sent to all members, ex-officio members, members of TAC and invited individuals and that proper notification is provided according to the rules for open meetings unless an executive session is specifically called.

   4.5. The Chair shall report actions and recommendations of the Executive Committee at the next meeting of TAC.

COORDINATORS

5. <u>Coordinator Selection</u>

   5.1. The TAC Chair currently appoints the following coordinators: Operations, Membership, and Training

   5.2. If a member's term of service on TAC continues into the next Society year, they may be reappointed by the incoming Chair.

      5.2.1. Coordinators are members of TAC, however, the Chair may appoint Consultants to a Coordinator position when there is a need for members who have expertise and experience in certain areas that are of immediate importance and not available from TAC members.

6. <u>Operations Coordinator (OC) Responsibilities</u>

   6.1. The TAC MOP and Reference manual have been extensively revised to bring them up to date with current practice. Items have been moved from the MOP to the Reference manual as appropriate and duplication between documents eliminated where possible.

      6.1.1. Standards Committee

      6.1.2. Electronic Communications Committee

      6.1.3. Handbook Committee

      6.1.4. Chapter Technology Transfer Committee

      6.1.5. Research Administration Committee

      6.1.6. Any councils? PubC – this is mostly Hbk, MemberC –mostly CTTC, TechC – covered by Chair. Probably these should be by specific invitation only when requested by the Council.

   6.2. Prior to each winter and Annual Society meeting, provide a summary about TAC and its underlying committees with information that may be of interest to those committees and councils.

   6.3. Coordinate activities involving technology transfer from, ~~TC/TG/TRG~~FGs/MTGs to the rest of the Society and the HVAC industry through members designated by those committees or councils. A report summarizing these activities shall be submitted to TAC at the Annual Society meeting.

   6.4. Improve technology transfer from TCs to chapters through program, handbook, standards, research and other means as required.

   6.5. Research continued improvements to electronic communications such as website enhancements and collaboration tools. With Electronic Communications Committee advice, review, recommend to TAC and oversee implementation of methods for improving the conduct of the business of TAC, ~~TC/TG/TRG~~FGs/MTGs and the dissemination of information about their activities.

6.6. Review, recommend and oversee implementation of periodic updates and changes to the ~~TC/TG/TRG~~ FG website template

6.7. Annually review and recommend changes to ASHRAE website policies that apply to TAC and ~~TC/TG/TRG~~FGs/MTGs for the Electronic Communications Committee consideration and implementation.

6.8. Coordinate the identification, development, and maintenance of other resources as needed to assist TAC members and ~~TC/TG/TRG~~FG/MTG Chairs in carrying out their responsibilities.

6.9. Review and propose changes to the TAC MOP, Reference Manual and ROB as directed.
   6.9.1. Maintain the reference manual procedures as described in the TAC MOP

7. Training Coordinator (TrC) Responsibilities

   7.1. Work with ASHRAE staff to implement approaches which improve access to TC training

   7.2. Develop and present training for incoming TAC members

   7.3. The content of and material used for the training session is prepared by the TrC in cooperation with the OC and shall be reviewed by TAC

   7.4. Identify training needs to support successful TC operations and conduct training sessions at the Annual and/or winter meetings for ~~TC/TG/TRG~~FG/MTG Chairs and Vice Chairs.

   7.5. The TrC or an individual appointed by the TrC leads the training sessions.

   7.6. In cooperation with the Operations Coordinator and the affected committees, prepare information suitable for technology transfer.

   7.7. Continued expansion and maintenance of new On-line training portfolio

   7.8. In cooperation with the Director of Marketing and as appropriate, work with liaisons of other committees (and Operations Coordinator) to develop, maintain, and disseminate presentation material that describe the functions and responsibilities of the technical committees and addresses technical issues in response to inquiries by Society members and the public.

   7.9. Coordinate the maintenance of the TAC website with the Manager of Research and Technical Services.

8. <u>Membership Coordinator (MC) Responsibilities</u>

    8.1. Identify and assist ~~TC/TG/TRGs~~ FGs with difficulty getting/retaining membership to improve their breadth of membership and committee operation.

    8.2. Assist TC/TGs in finding volunteers or groups to help maintain/update Handbook volume chapters that are not being properly maintained.

    8.3. Monitor, evaluate and develop improvements to coordinate the annual ~~TC/TG/TRG~~FG/MTG roster update process and improvements thereto. Testing and Roll-out of New On-line roster update system.

    8.4. Identify and implement activities that improve the ability of TCs to attract and develop new membership not just recycle the old ones.

    8.5. Maintain and refine the criteria and forms for the outstanding TC award so that they help the TCs to become better. Review the results in cooperation with the Section Head to identify and improve the performance of all committees under TAC purview.

    8.6. Oversee improved quality, process efficiency, and expansion of RPMs (Remote Participation in Meetings) – Opens ASHRAE up to the world.

    8.7. Liaison with Conferences and Expositions Committee (CEC) to coordinate improvements between the ~~TC/TG/TRG~~FGs/MTGs and CEC

    8.8. Coordinate the maintenance/development of criteria and yearly award selection for the George B. Hightower Technical Achievement Award based on the procedures described in **Appendix E**.

    8.9. Coordinate the development and application of procedures for reviewing technical content in Society publications in cooperation with other committees as appropriate.

    8.10. On a regular basis, work with staff to quantify the impact that TCs have had within ASHRAE and to society as a whole by quantifying, for example, the amount of volunteer time that is devoted to TC work each year. Convert those estimates into a dollar amount when practical.

9. <u>Other Responsibilities for All Coordinators</u>

    9.1. The Coordinators report their activities and make recommendations for action as needed at the appropriate point in the agenda of the TAC meeting.

    9.2. Before each meeting, in cooperation with the Operations coordinator, staff will provide each liaison to TAC from another committee and all section heads a copy of the "Liaison speaking guidelines" found in **Appendix D**.

SECTION HEADS

10. Organization

10.1. Sections are groups of ~~TCs, TGs,~~ FGs and MTGs ~~TRGs~~ that have been formed and organized by TAC according to fields of interest or for administrative purposes.

10.2. The ~~TCs, TGs~~ FGs and MTGs, ~~and TRGs~~ are currently grouped into eleven (11) Sections based on their technical scopes as follows:

SECTION 1.0,   FUNDAMENTALS AND GENERAL
SECTION 2.0,   ENVIRONMENTAL QUALITY
SECTION 3.0,   MATERIALS AND PROCESSES
SECTION 4.0,   LOAD CALCULATIONS AND ENERGY REQUIREMENTS
SECTION 5.0,   VENTILATION AND AIR DISTRIBUTION
SECTION 6.0,   HEATING EQUIPMENT, HEATING AND COOLING SYSTEMS
                       AND APPLICATIONS
SECTION 7.0,   BUILDING PERFORMANCE
SECTION 8.0,   AIR-CONDITIONING AND REFRIGERATION SYSTEM
                       COMPONENTS
SECTION 9.0,   BUILDING APPLICATIONS
SECTION 10.0, REFRIGERATION SYSTEMS
SECTION MTG, MULTIDISCIPLINARY TASK GROUPS

11. General Responsibilities

11.1.   Coordination and liaison

11.1.1.   The Section Head advises ~~TC/TG/TRG/~~FG and MTG Chairs of operating policies and procedures of the Society and/or TAC as described in the Manual of Procedures for Technical Committees, Task Groups, Multidisciplinary Task Groups, and Technical Resource Groups.

11.1.2.   The MTG Section Head is responsible for the coordination and development of the activities of the MTGs within their Section and shall provide liaison between them and TAC. The MTG scope may also involve interactions with other Standing Committees and Councils, and those interaction activities shall be managed by the MTG Section Head and reported through TAC to Technology Council.

11.1.3.   The Section Head represents the interest of their Section to TAC and is responsible for ensuring that their opinions and views are made known.

11.1.4.   The Section Head arranges for spokespersons, when requested, to represent ~~TC/TG/TRG/~~ FGs and MTGs before TAC.

11.1.5.   The Section Head establishes and maintains contact with liaisons assigned by standing committees of the Society to the committees in their Section in order to strengthen and develop the ~~TC/TG/TRG/~~ FGs and MTGs.

11.1.6.   The Section Head requires each ~~TC/TG/TRG~~ FG in their Section to have, as a minimum, subcommittees and subcommittee chairs on Research, Program,

Handbook, and Standards. MTGs are excluded from this requirement, unless their scope specifically includes one of these responsibilities.

11.1.7. Prior to August 1 of each Society Year, each Section Head should furnish the TAC Chair with a list of individuals that they recommend to be considered for appointment to TAC.

12. Specific Responsibilities

12.1.   The MTG Section Head promotes interaction between identified technical groups outside ASHRAE and ASHRAE ~~TC/TG/TRG/~~FGs and MTGs through members designated by those organizations. Attends meetings of these organizations at the winter and Annual Society meetings when possible.

   12.1.1.   A list of organizations outside ASHRAE that we maintain contact with is kept by MORTS. Some of them are:
      12.1.1.1.   USNC/IIR
      12.1.1.2.   Nuclear HVAC Users Group
      12.1.1.3.   Building Smart Alliance

   12.1.2.   Prior to each winter and Annual Society meeting, provide a summary of TAC and its underlying committees with information that may be of interest to the organizations.

12.2.   As needed, the Section Head assists the ~~TC/TG/TRG~~ FG and MTG Chairs in their Section to carry out their assigned responsibilities.

12.3.   No later than February 28 each year, using the roster update process described in the ~~TC/TG/TRG/~~FG and MTG MOP, the Section Head furnishes the Administrative Assistant for Research and Technical Services with a list of individuals that they recommend to be appointed as members of the ~~TC/TG/TRG/~~ FGs and MTGs in their Section.

   12.3.1.   Each Section Head, before finalizing their recommendations, considers all the factors associated with the position of member of an ~~TC/TG/TRG~~ FG and MTG to ensure that the persons they recommend will serve in the best interest of the Society. The MTG Section Head will also consult with the chairs/leaders of the ~~TCs and TGs~~ FGs and non-~~TC~~ FG groups that are represented on the MTG to confirm that the ~~TC, TG~~ FG or non-~~TC~~ FG group endorses their designated representatives on the MTG.

12.4.   Each year, the Section Head reviews rosters prepared by ~~TC/TG/TRG~~ FG and MTG Chairs in their section to verify that the rosters comply with the provisions of the ~~TC/TG/TRG/~~FG and MTG MOP. The importance of a correct roster cannot be overemphasized: no official committee work can be carried out without a roster, and much committee work could be invalidated if voted on by an improperly constituted committee. The roster update procedure is as follows:

   12.4.1.   Each year prior to the Winter Meeting, staff sends a "Roster Update ~~Form~~ notification" to each ~~TC/TG/TRG/~~ FG and MTG Chair. The forms are to be

completed and e-mailed to the Section Heads not later than 9:00 PM on
Tuesday of the Winter Meeting.

12.4.2. The Section Head reviews the forms submitted by each Chair in their Section to ensure that the conditions for TC/TG/TRG/FG and MTG membership given in the TC/TG/TRG/FG and MTG MOP are met. If changes are required, the Section Head works with the TC/TG/TRG FG and MTG Chair to correct the information on the forms until both the TC/TG/TRG/ FG and MTG Chair and Section Head approve the information. The Section Head then sends the approved forms to the Administrative Assistant for Research and Technical Services no later than February 28.

12.4.3. Staff creates the rosters for the next Society year and send a first draft to the Section Head. The Section Head reviews the draft roster against the input that was provided in the approved Roster Update Form. Corrections are sent to staff within two weeks. If no changes are necessary, the Section Head must so indicate. These procedures are repeated until each Section Head has indicated that no further changes are necessary.

12.4.4. After each Section Head has indicated to staff that the roster has the correct information staff sends out appointment letters to each TC/TG/TRG/FG and MTG member with a copy of the roster for the upcoming Society year. Roster changes after this time must be made using the Emergency Roster Change Procedures and be approved by the Section Head.

12.5. No later than 30 days prior to the Technology Weekend meeting of TAC, the Section Head reviews the title, scope, and activities of each TC, TG, FG and MTG and TRG within their section and makes recommendations to TAC on continuing, merging, or disbanding existing committees, forming new committees, or altering scopes to fulfill the needs of the Society in the areas of responsibility of their Section.

12.6. For each TAC meeting, the Section Head prepares a written and oral Section Head report of actions, problems, and concerns from the TC/TG/TRG FGs and MTGs in their Section to be included in the TAC meeting minutes.

12.7. The Section Head or designee presides over their Section meeting with TC/TG/TRG/ FG and MTG Chairs and Vice Chairs at the Annual and Winter Society meetings. The Section Head contacts the TC/TG/TRG/FG and MTG Chairs and Vice Chairs at least 30 days before the Section meeting to remind them to attend. (Guidelines for conducting the Section Meetings are given in **Appendix C**).

12.8. The Section Head ensures that each TG/TG/FG and MTG/TRG in their Section distributes its meeting agenda at least 30 days before each Annual and winter meeting, and that the minutes are distributed within 60 days following each meeting.

12.9. The Section Head periodically reviews TC/TG/TRG FG websites in their Section for violations of ASHRAE website policies and to ensure that the websites reflect current activities. The Section Head communicates website violations and needs for improvement to the TC/TG/TRG FG Chair.

12.10. Information on the current activities of MTGs will be posted to a section of the ASHRAE website and will be reviewed periodically by the MTG Section Head to ensure the information is up-to-date, accurate, and complete.

12.11. The Section Head presents a certificate of appreciation to each retiring ~~TC/TG/TRG/~~
~~FG and~~ MTG Chair in their Section at the Annual meeting. (see B2.6.2)

12.12. Each Section Head informs their committees and solicit nominations for the Hightower
Award following the Annual meeting to be submitted to TAC for consideration before
September 1 of each year as described in **Appendix E**.

ANCILLARY RESPONSIBILITIES

13. Review of Awards

TAC reviews all requests or suggestions for new awards, revisions to current awards, or award
deletions according to the guidelines for awards outlined Appendix F. In order to minimize the
entire committee time, it is suggested that a subcommittee of one or more TAC members be
established by the TAC Chair to consider the request and report to TAC for a formal
disposition of the request.

14. Broad Peer Review of Special Publications

14.1. When the publication requires a broader peer review by members of other
~~TC/TG/TRG/~~FGs and MTGs per the broad peer review procedure described in
Appendix F of the ~~TC/TG/TRG/~~FG and MTG MOP, the TAC Chair shall:

14.1.1. Ensure that all committees and members under TAC's purview are notified
of the proposed publication through staff action.

14.1.2. In consultation with the Section Heads, shall identify one or more
~~TC/TG/TRG/~~FGs and MTGs who should participate and assign
participation/review responsibilities to them if necessary.

14.1.3. Arrange for a TAC vote on the proposed publication if recommended by the
working group and the review committee.

14.2. The Section Head(s) involved work with the identified committees to obtain
representation on the special publication working group from each identified
committee.

14.3. The Section Head of the sponsoring committee works with the Chair of that committee
to appoint the members of the working group from those identified.

APPENDIX A Mentoring Program

Based on ROB Mentoring program

Before or during the final meeting of the Fiscal Year (Annual meeting), the TAC Vice Chair:

1. Assigns an incumbent TAC mentor to each incoming new member prior to the first meeting.

2. Assures that time is allotted at the beginning of the first meeting sufficient for proper introduction of the new member by the assigned mentor.

3. Before the Annual meeting and in cooperation with the Chair, assesses effectiveness of the mentor/new member relationship and suggest changes and improvements.

4. Provides assistance that enhances the mentor/new member relationship.

   The mentor has the following responsibilities:
   - Insure that the new member has received a copy of the group Rules of the Board (ROB), Manual of Procedures (MOP), and a copy of the most recent meeting minutes to acquaint them with the functions and focus of the group.

   - Contact their assigned new TAC member before the next Committee Meeting to introduce themselves and explain the relationship and its purpose.

   - The mentor should make every effort to update the new member on:
     ✓ Committee functions, focus and objectives.
     ✓ Review the appropriate Rules of the Board and Manual of Procedures (MOP) with the new member.
     ✓ Discuss the typical meeting format and member duties and responsibilities.

   - The mentor should meet the new member before the respective meeting is scheduled to start.

   - The new member should be encouraged to develop rapport with other members to effectively work with fellow members and maximize productivity.

   - Since the new member will replace an existing section head or coordinator, help them to contact the outgoing member to insure that the new member is current on the activities and challenges of the position they will be representing.

The relationship terminates at the end of the new member's first year as a member of TAC.

APPENDIX B – Management by Objectives (MBOs)

The objectives are shown on an MS Word document that is provided to the Committee Chair and Vice Chair. The following is an example of the information currently required.

TAC MBOs
Technical Activities Committee MBOs 2015-2016
Tom Lawrence, Chair 1/23/2016

Item #	MBO	Status	Date Due	Assigned To	Applicable Strategy #	MBO Comments	Strategic Direction Specific Comments	Fiscal Impact

- List objectives, **not action items or ongoing committee activities** such as updating the committee's MOP.

- State objectives in clear, concise, measurable language. If necessary, cite sub-tasks and interim steps as a means of measuring objective completion.

- Cite both the completion dates for the overall objective as well as individual sub-tasks.

- State fiscal impact in dollars, man-hours, or man-trips. State whether the program has been approved by the council and whether it is cost has been included in the budget.

- State the primary responsible individual, subcommittee, or body.

- Report a brief but complete statement of status. Cite completion date if objective is fulfilled.

APPENDIX C - OPERATIONAL GUIDELINES FOR SECTION MEETINGS

1. Each ~~TC/TG/TRG/~~FG and MTG chair and Vice Chair meets with their Section Head at each Annual and winter meeting. The meeting rooms are listed in the program, and are usually held from 6:30 AM to 8 AM on Sundays.

2. The purpose of the Section meeting is to provide an opportunity for personal communication between the ~~TC/TG/TRG/~~FG and MTG Chairs and their Section Head on technical and administrative issues facing their section and/or the Society. Liaison members of other standing general committees need an opportunity to distribute written announcements to address administrative matters relating to TC/TG/TRG/MTG activities.

    Liaisons wishing to speak at the meeting may do so at the invitation of the Section Head and in accordance with the **Liaison Speaking Guidelines** (See Appendix D.).

3. The Section Head invites the ~~TC/TG/TRG/~~FG and MTG Chairs and Vice Chairs to the meeting.

4. The Section Head conducts the meeting in the same way that they would conduct a TC meeting, with the Section Head serving as Chair.

5. The Section Head sends out the Section meeting agenda at least 30 days before each Annual and Winter meeting, and the minutes (with attachments) within 60 days following each meeting.

6. The Section Head, in collaboration with the ~~TC/TG/TRG/~~FG and MTG Chairs and Vice Chairs, identifies Section MBOs for the upcoming year and introduced them at the Annual meeting.

7. Suggested agenda:
    (The agenda and times estimated are for guidance only and should be modified to be sure the most important information is discussed and that there is adequate time to discuss things important to the committee chairs. Note that the time estimates shown allow for other important business to be conducted within the time frame allotted.)

    a) Introduction of ~~TC/TG/TRG/~~FG and MTG Chairs, Vice Chairs, and guests (5 minutes).

    b) Review and approval of agenda (2 minutes). (Note that you might want to solicit additions and corrections at the time the draft agenda is sent to the ~~TC~~ FG Chairs – it is almost impossible to do anything in only 2 minutes)

    c) Review and approval of minutes (3 minutes).

    d) Summarize discussion from last meeting and status of actions assigned (5 minutes).

e) Liaisons from other committees should each be given a chance to speak and distribute information pertinent to the section from their committee. An effort should be made to accommodate their schedules without major disruption of the Section meeting (15 Minutes).
   a. Research Administration
   b. Conference and Exposition Committee (CEC)
   c. Handbook
   d. Other Standing Committees

f) Discuss the MBOs set for the year and how the section can work together to address them (10 minutes).

g) Review summary report for the Section prepared from the ~~TC/TG~~ FG activity database and TAC (15 minutes).
   a. Section activities and trends will be discussed relating to membership, research, programs, publications and new communication tools and services.
   b. Identify shared opportunities and challenges for section (10 minutes).
   c. Adjourn.

APPENDIX D - Liaison speaking guidelines.

Liaisons,

Whether you are attending a TAC Section Breakfast or a Technical Committee meeting, your primary task is to be sure that the committee understands what the most important information your committee wants this committee to know and to do it in the most effective way possible. The following guidelines will insure that you are successful and that you continue to have a cordial relationship.

1. INFORM the Section Head or Committee Chair in advance (if possible) that you will be attending and if you have specific time limitations for attending (such as you need to leave by XX:XX).
2. Before the meeting starts, BE SURE YOU TELL the Section Head or Committee Chair who you are, that you are available, wish to speak (if you do) and other responsibilities during the same time frame so that you can be recognized appropriately without interrupting the meeting as agendas are usually tight during the meeting. Committee Chairs recognize that you probably have other meetings you attend at the same time and they are always willing to make as much accommodation as they can without totally disrupting the meeting. However, you are probably not the most important thing on the agenda or your presence would have been requested in advance.
3. PROVIDE an electronic copy of the written material to the Committee Chair(s) and/or Secretary so that your information can be included in their documentation. You may also bring the written material to the breakfast or committee meeting.
4. DO NOT READ any written material you bring. All of our committee members can read.
5. BE PREPARED to summarize the **3** most important points. The rest can be read when the committee member gets a chance. This will keep your presentation brief, efficient and highlight the most important things you need to be sure everyone hears.
6. PLAN on your presentation taking <u>no longer than 2 – 4 minutes</u> exclusive of discussion or questions by the group. If the Section Head or Committee Chair wants to entertain discussion or questions, it is their choice.
7. If you are a new liaison to the section or committee, leave your contact information with the Section Head and Committee Chair(s) or Secretary.
8. Sign the attendance sheet.

APPENDIX E - PROCEDURE FOR GEORGE B. HIGHTOWER TECHNICAL ACHIEVEMENT AWARD

1. PURPOSE.

The purpose of the George B. Hightower Technical Achievement Award is to recognize annually an individual for excellence in volunteer service in the area of ~~TC/TG/TRG~~ FG technical leadership and contribution, which includes all ~~TC, TG~~ FG and MTG, ~~and TRG~~ activities except for research and standards. The award will serve to heighten general membership awareness of, and interest in, Society activities at the ~~TC/TG/TRG~~ FG level.

George B. Hightower was an exceptional ASHRAE member. A member since 1938, he regularly attended Society meetings until his health began to fail. No other person has received more Society level awards than George B. Hightower. He received the ASHRAE-Alco Medal for Distinguished Public Service in 1974; became an ASHRAE Fellow in 1977; received the Distinguished Service Award in 1984; the Distinguished 50-Year Member Award in 1988; the Andrew T. Boggs Service Award in 1997; and the Louise and Bill Holladay Distinguished Fellow Award in 2000.

2. AWARD PRESENTATION.

The George B. Hightower Technical Achievement Award is presented annually but may be omitted if a suitable candidate is not identified. The award will consist of an acrylic trophy with the recipient's name and the year of the award etched into the face of the trophy. The award will be donated by the Atlanta Chapter, to which Mr. Hightower belonged.

3. ELIGIBILITY.

The award is open to ASHRAE ~~TC/TG/TRG~~ FG voting and corresponding members who meet the minimum point requirement detailed in Section 7. Technical Activities Committee (TAC) and Technology Council members or current ~~TC and TG~~ FG chairs of the nominating committee(s) are not eligible for receipt of the George B. Hightower Technical Achievement Award during the terms they serve on the respective committees, or positions. Past recipients of the award are not eligible.

MTGs participate in the George B. Hightower award through one or more of the ~~TCs/TGs~~ FGs that comprise the MTG.

4. NOMINATION.

A nomination for the George B. Hightower Technical Achievement Award is made by a TC/TG/TRG chair completing a nomination form that confirms the eligibility and outlines the special contribution that the nominee has made to the work of the nominating committee(s) during the most recent four years.

The chair submits the nomination to the lead nominating committee's TAC Section Head by September 1.

5. JUDGING

The TAC Section Head reviews all nominations received from their Section and forwards eligible nominees from that Section to TAC for its consideration at their Fall Meeting. Prior to the ASHRAE Winter Meeting, TAC shall recommend a candidate to the Honors and Awards Committee. The recommended candidate shall be chosen from all nominations that meet eligibility requirements as outlined under Section 7 Criteria for Selecting Recipients and approved by TAC. TAC shall consider award points and the explanation provided by the nominating ~~TC/TG~~ FG in its deliberations. TAC should also review the candidate's ASHRAE online bio for verification of points.

Because it is a 'pass through award', TAC reports the name of the recipient to Technology Council as an information item and sends the recommendation to H&A who in turn recommends the name to Members Council for approval.

All nominators (not just the winning nomination) are to be apprised of the person selected by the TAC chair no later than 60 days after the selection process has been completed.

6. PRESENTATION

At the ASHRAE Annual Meeting, the George B. Hightower Technical Achievement Award is presented during the recipient's ~~TC/TG/TRG~~ FG meeting.

> **Commented [KM4]:** Check with Staff to determine "who" makes this presentation.

7. PART I - ELIGIBILITY REQUIREMENTS

7.1 Nominees must have earned a minimum of 10 points **during their career** on ~~TC/TG/TRG/~~FGs and MTGs as defined below to be eligible for the award.

7.2 If eligible, the award is given **based only on the most recent four years of service** on ~~TC/TG/TRG/~~FGs and MTGs. This service must be detailed in the explanation for it to be considered and is the actual basis for receiving of the award.

Eligibility points are defined as follows:

A "tour" is an appointment for 1 year. Assignment to the same position for multiple years each count as a separate tour.

A.	Program Subcommittee	
	1. Forum Moderator	½ point per forum
	2. Seminar Chair	1 point per seminar
	3. Conference Chair	2 points per session
	4. Technical Chair	3 points per sympos
	5. Subcommittee member	1 point per tour
	6. Subcommittee Chair	2 points per tour
B.	Handbook Subcommittee	
	1. Chapter contributor/reviewer	1 point per chapter
	2. Chapter author	3 points per chapter
	3. Subcommittee member	1 point per tour
	4. Subcommittee Chair	2 points per tour

    C.   Technical Inquiries
        1. Respond to Question from Headquarters   1/4 point per question
        2. Author Frequently Asked Question   1 point per question

    D.   Accept Special Assignment from Chair   Up to 3 points per
        assignment at Chair's discretion.

    E.   ~~TC/TG/~~FG and MTG~~/TRG~~ Officers
        1. ALI Coordinator   2 points per tour
        2. Webmaster   2 points per tour
        4. Secretary   2 point per tour
        5. Vice-Chair   2 point per tour
        7. Chair   3 points per tour

    F.   MTG member   1 point per tour
    G.   Inter-Society Liaison Appointed by TAC   1 point per tour

8.   **PART II – TECHNICAL LEADERSHIP AND CONTRIBUTION**
        This part determines the actual award winner.
        Provide a one page explanation of the nominee's outstanding technical leadership and contributions to the committee(s) **during the past four years** including details on why you think this person deserves the award. (Research and standards activities are NOT to be considered even if done as part of a committee assignment.)

SUBMIT NOMINATION FORM TO SECTION HEAD BY SEPTEMBER 1.

The form (ASHRAE GEORGE B. HIGHTOWER TECHNICAL ACHIEVEMENT AWARD NOMINATION FORM) can be found on the ASHRAE website at https://www.ashrae.org/TCs under the heading "Procedures, Forms & Information for ~~TCs/TGs/~~FGs and MTGs ~~and TRGs~~"

> **Commented [KM5]:** Need to check the forms for proper title?

APPENDIX F - GUIDELINES FOR AWARDS

All requests or suggestions for new awards, revisions to current awards, or award deletions shall be forwarded to the Honors and Awards Committee for review and recommendation before being forwarded to the BOD for review and approval.

ASHRAE awards are grouped into the following categories, each of which has their defined forms of award:

1.   Personal Honors
2.   Personal Awards for General Society Activities
3.   Personal Awards for Specific Society Activities
4.   Paper Awards
5.   Society Awards to Groups or Chapters

Awards will normally carry the name of an ASHRAE activity (e.g., Distinguished Service Award, Fellow, Journal Papers Award) No business, product, or commercial name shall be used for an award. Only in very exceptional instances may consideration be given to naming the award for an individual member.

Proposers of awards shall submit a detailed description, including the name of the award, the suggested category for the award, the reason for establishing the award, and the proposed selection and awarding process to the Honors and Awards Committee.

Proliferation of awards that would tend to detract from the worth of existing awards must be avoided. The award must first be considered as applying to an important field of ASHRAE related activity; the name of the award would then add prestige.

The committee shall include in their supporting material for candidates only information pertinent to the requirements for the particular award for which the candidate is being recommended. (70-07-01-11)

It is the policy of the Society not to consider for approval any Society honors or awards posthumously, other than the Hall of Fame

APPENDIX G - ASHRAE Outstanding Technical Committee Award (OBSOLETE)

IT WAS DECIDED THAT THIS AWARD IS SERVING NO REAL PURPOSE AND THE OPERATIONS COORDINATOR WAS ASKED TO REMOVE IT. – KWC June 2017

Appendix H - REVISIONS TO RULES AND PROCEDURES
(This section is for informational purposes only and revisers should always look at the current information)

Part 1 Revisions to Rules of the Board (ROBs)

Proposed changes to Rules of the Board (ROBs) may be submitted by committees, councils, and Board members. Changes proposed by a committee shall be submitted through the body to which it reports; councils and Board members may submit proposed changes directly to the Board of Directors.

To propose a change to an existing ROB:

Present a two-column comparison showing the current ROB number and wording and the proposed ROB wording. A proposed change, at a minimum, shall include the ROB number the proposed change, and the reasons for the change.

To propose a new ROB:

Present the wording for the new rule and include a statement indicating a recommended placement of the new rule within the ROB framework. Examples:

It is recommended that this rule be placed in ROB, Book II, Publishing Council ROB.

It is recommended that this rule be placed in ROB, Book I, Section 300, Meetings of Members.

To propose rescinding an existing ROB, include in the recommendation the ROB book in which the rule is located, the rule number or other identification code, and the wording of the rule.

Appendices to the ROB are considered part of the ROBs; therefore, revisions to appendices shall follow the same procedure as revisions to ROBs.

Proposed changes to Society-wide policies and procedures (e.g., Travel Reimbursement Policy, Election and Appointment Procedures) shall follow the same procedure as for changes to ROBs.

Part 2 Revisions to Manual of Procedures

Revisions to the Manual of Procedures must be approved by the Technology Council or designated council subcommittee.

Revisions and additions to the TAC Reference Manual are made by the Operations Coordinator as suggested by TAC members and maintained by staff. TAC members shall be informed about additions, changes and revisions as described in the TAC MOP.

MANUAL OF PROCEDURES

FOR

TECHNICAL ACTIVITIES COMMITTEE

REVISED: 02/05/2020

FOREWORD

The Technical Activities Committee is a General Standing Committee of the Society and operates under the direction of the Board of Directors and Technology Council. The Rules of the Board ROB) for the Technical Activities Committee are the constitution of the committee. Proposed changes to the ROB and their appendices must be approved by the Board of Directors.

This Manual of Procedures (MOP) is a supplement to the TAC ROB and describes the methods and procedures by which the committee accomplishes the duties and responsibilities assigned to it. The MOP is an internal document of the committee for its own guidance. The MOP and revision thereto, following approval by the committee, shall be submitted to Technology Council or designated council subcommittee for approval.

Proposed TAC MOP and ROB changes shall normally only be presented to Tech. Council for approval once a year for consideration at their fall meeting. Proposed changes that TAC believes require more immediate attention shall first be presented to the chair of Tech. Council for permission to submit to Tech. Council.

YOUR COMMENTS ARE WELCOME

Should you have a comment or suggestions on this Manual of Procedure, please submit them electronically to the ASHRAE Manager of Technical Services (MOTS).

E-mail: MOTS@ashrae.net

The MOTS will consolidate comments for TAC. TAC intends to maintain Manual of Procedure as a "living document" and update it as it is needed and practical.

RECENT REVISIONS

Summary of Changes for 2/05/2020 Revision:
1. Editorial changes were made throughout. Changes include changing MORTS to MOT, changes to A3.1, B2.8 & B2.9.

Summary of Changes for 12/11/2017 Revision:
1. Section D - COORDINATORS streamlined to continue to allow TAC Chair the authority to name and dissolve Coordinator positions, but all details on the current TAC Coordinators will now reside in latest TAC Reference Manual.

TABLE OF CONTENTS

SECTION A – TECHNICAL ACTIVITIES COMMITTEE – GENERAL

Part 1 Technical Activities Committee

A1.1 The Technical Activities Committee (TAC) shall supervise and assist in the formation and operation of Functional Groups (FG) (i.e., technical committees (TCs), task groups (TGs), ~~multidisciplinary task group (MTGs)~~, and technical resource groups (TRGs), and multidisciplinary task groups (MTGs), including determining scopes and membership.

> **Commented [KM1]:** Format to reflect separate "FG" and "MTG" MOPs - throughout this document

A1.2 The Technical Activities Committee shall coordinate and cooperate with other committees whose activities involve ~~TCs, TGs,~~ FGs and MTGs, ~~and TRGs,~~ such as Chapter Technology Transfer, Handbook, Program, Refrigeration, Research Administration, Special Publications, and Standards in order to achieve the Society's objectives.

Part 2 Membership

A2.1 The Technical Activities Committee shall consist of 16 voting members as described in Section 2.428.002.1 of the TAC ROB.

Part 3 Meetings

A3.1 Normally two meetings are held each year: one at each Annual and Winter Society meeting and online interim meetings as needed

Part 4 Operations

A4.1 Any member of TAC is eligible to introduce motions or items for consideration.

SECTION B – CHAIR AND VICE CHAIR

Part 1 Selection

B1.1 The Chair and Vice Chair of TAC are nominated by the President-Elect of the Society from the current membership of TAC and elected by the Board of Directors to serve one-year terms commencing at the close of the next Annual Meeting of the Society.

Part 2 Responsibilities of Chair

B2.1 The Chair of TAC is responsible for the organization of TAC and the TAC Executive Committee.

B2.2 The Chair shall preside over all meetings of TAC and the TAC Executive Committee.

B2.2.1 The Chair shall be responsible for the preparation of agendas for meetings of TAC and the TAC Executive Committee with the advice of the Manager of Technical Services and TAC members.

B2.2.2 The Chair shall be responsible for ensuring that the Manager of Technical Services provides minutes of the meetings of TAC and the TAC Executive Committee within 30 days of the meetings.

B2.2.3 All draft minutes distributed by TAC shall include the following notice on the bottom of the cover page: "These draft minutes have not been approved and are not the official, approved record until approved by this committee."

B2.3 The Chair shall annually designate members of TAC to serve as Liaison Coordinator and Special Activity Coordinator during each Society year.

B2.4 The Chair shall appoint other Coordinators, ad hoc committees, or working groups from the membership of TAC or the Society whenever necessary in order to assist in fulfilling the responsibilities of TAC. As conditions change, the Chair may dissolve these other Coordinator positions and committees.

B2.4.1 The Chair shall appoint other committees and representatives as directed by the President or the Board of Directors or as requested by other standing committees of the Society.

B2.5 The Chair shall annually designate members of TAC to serve as Section Heads during each Society year.

B2.6 The TAC Chair shall, after consultation with the Section Heads, appoint a Chair for each Technical Committee, Task Group, Multidisciplinary Task Group, and Technical Resource Group. The ~~TC/TG/~~FG and MTG~~/TRG~~ Chair shall preferably have served at least one term as Vice Chair or Secretary and may be appointed for one or more one-year terms, but not normally to exceed two consecutive terms.

B2.6.1 An exception for additional consecutive terms may be granted by the TAC Chair if the ~~TC/TG/~~FG and MTG~~/TRG~~ makes a written request and that request is approved by the Section Head. The extended appointment shall be made only if it serves the best interest of the Society.

B2.6.2 The TAC Chair shall thank retiring ~~TC/TG/~~FG and MTG~~/TRG~~ Chairs for their service.

B2.7   Members of ~~TC/TG/~~FGs and MTGs~~/TRGs~~ shall be appointed by the TAC Chair from nominations made by the current ~~TC/TG/~~FG and MTG~~/TRG~~ Chair and endorsed by the Section Head. Members of ~~TC/TG/~~FGs and MTGs~~/TRGs~~ are appointed normally for a maximum of four consecutive one- year terms.

B2.7.1 An exception for additional consecutive terms may be granted by the TAC Chair if the ~~TC/TG/~~FG and MTG~~/TRG~~ makes a written request and that request is approved by the Section Head. The extended appointment shall be made only if it serves the best interest of the Society.

B2.8   With the assistance of the Manager of Technical Services, the Chair shall prepare and submit to the Technology Council, reports as required.

B2.9   The Chair shall be responsible for providing information to Society members to publicize the activities of the ~~(TCs), (TGs), (MTGs) and (TRGs)~~FGs and MTGs; and other items of current significant interest concerning the operation of TAC.

B2.10   The Chair shall be responsible for meeting annual objectives for TAC. A status report on the objectives shall be included in the semi-annual report submitted to the Technology Council at the Society Winter meeting. A final report of the objectives shall be included in the annual report submitted to the Technology Council at the Society Annual meeting.

B2.11   The Chair shall serve as a non-voting member of Technology Council and as a voting member of the Oversight and Functional Planning Subcommittees of Technology Council.

Part 3   Responsibilities of the Vice Chair

B3.1   In the absence of the Chair, the Vice Chair shall assume the Chair at any scheduled or called meeting of TAC or the TAC Executive Committee. Specific responsibilities of the TAC Vice Chair are outlined in the TAC Reference Manual.

SECTION C – EXECUTIVE COMMITTEE

Part 1   Membership

C1.1   The members of the Technical Activities Executive Committee (TAC ExCom) include the TAC Chair, the TAC Vice Chair, and the TAC Coordinators.

C1.2   The following Ex-Officio members of the Technical Activities Executive Committee may participate in the discussions but are not eligible to vote:

> Manager of Technical Services Director of
> Technology
> Board Ex Officio
> Coordinating Officer
> Consultants to the TAC

Part 2   Meetings

C2.1   The Technical Activities Executive Committee shall meet before the first scheduled meetings of TAC at the Annual and Winter Meetings of the Society. See the TAC Reference Manual for details concerning meetings of the Technical Activities Executive Committee.

SECTION D – COORDINATORS

Part 1   Authority to Appoint & Dissolve Coordinator Positions

D1.1   The TAC Chair shall have the authority to appoint and dissolve Coordinator positions as needed.

Specific responsibilities of the current coordinators are outlined in the TAC Reference Manual

SECTION E – SECTION HEADS

Part 1   Selection

E1.1   A Section Head is a member of TAC who has been designated by the Chair to supervise the ~~TCs, TGs and TRGs~~ FGs that are assigned to a Section.

E1.2   The MTG Section Head is a member of TAC who has been designated by the Chair to supervise the MTGs in the MTG Section.

Part 2   Section Head Responsibilities

E2.1   Each Section Head shall be responsible for the coordination and development of the activities of the ~~TCs, TGs and TRGs~~ FGs within his/her Section and shall provide liaison between them and TAC.

E2.2   The MTG Section Head shall be responsible for the coordination and development of the activities of the MTGs within the MTG section and shall provide liaison between them and TAC. The MTG scope may also involve interactions with other Councils, and those interaction activities shall be managed by the MTG Section Head and reported through TAC to Technology Council.

Specific responsibilities of the Section Heads are outlined in the TAC Reference Manual.

## SECTION F – ANCILLARY RESPONSIBILIES

Part 1   Honors and Awards

F1.1   TAC will annually review all eligible nominations received and make a recommendation to the Honors and Awards Committee for its consideration on the George B. Hightower Award recipient based on the procedures outlined in the TAC Reference Manual.

F1.2   TAC will review all requests or suggestions for new awards, revisions to current awards, or award deletions according to the guidelines for awards outlined in the TAC Reference Manual.

Part 2 Broad Peer Review of Special Publications

F2.1   The Chair of TAC shall be notified by staff on a regular basis of all new special publications that are in development at the ~~TC/TG~~/FG and MTG/~~TRG~~ level. The TAC Chair, in consultation with TAC members, shall then determine whether a publication requires a broader peer review by members of other ~~TC/TG~~/FGs and MTGs/~~TRGs~~ per the broad peer review procedure described in Appendix F of the ~~TC/TG~~/MTG and/~~TRG~~ FG MOP.
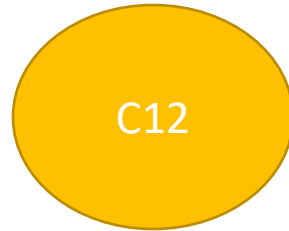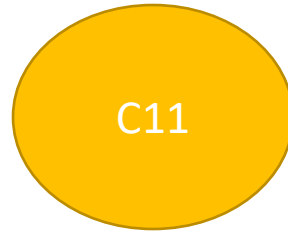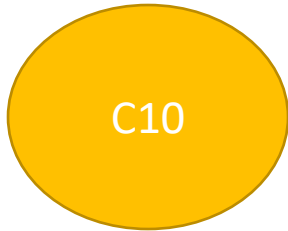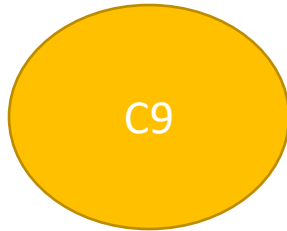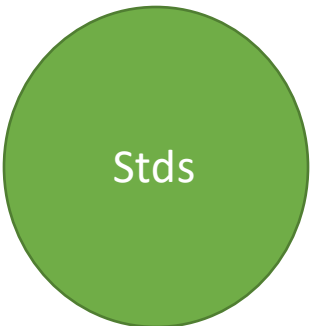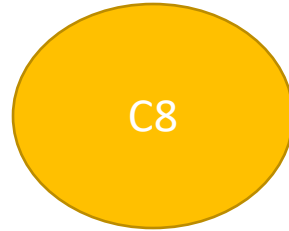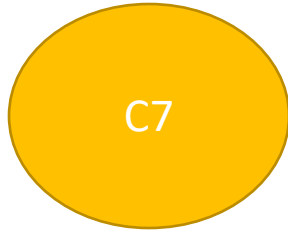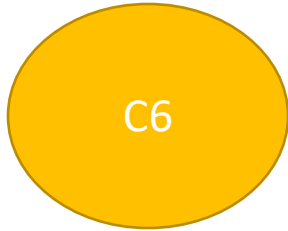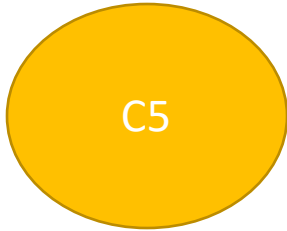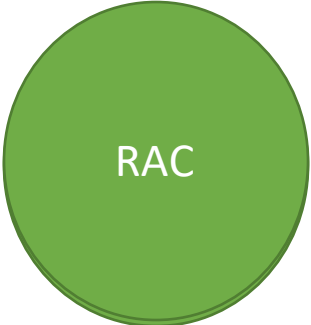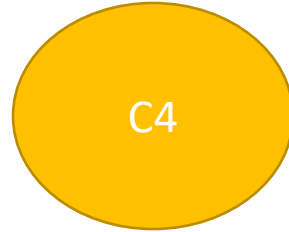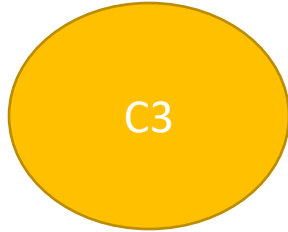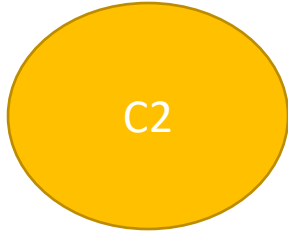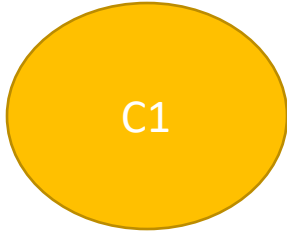
Communities

- Elevate status of our technical resources
- Report directly to Tech Council - voting members
- Absorb current standing committees
  - REF-CPCC
  - EHC
  - Residential Bldgs
- Act like a combination of a Standing Committee & MTG
  - TCs become voting member of Community

Nominations Needed!

Committee Nominations

- Nominations for elected positions (Councils, RAC, TAC, Standards, and Handbook) are due **mid-September**.

- Nominations for appointed committees are due February 17.

- Speak with your committee ExO/CO if your current appointment ends in June and you wish to be nominated for another committee.

Technical and Society Level Committees
ashrae.org/committee-nominations

Honors & Awards Nominations
ASHRAE's awards fall into one of six categories:

- Personal Honors
- Personal Awards for General & Specific Society Activities
- Paper Awards
- Society Awards to Groups or Chapters
- Chapter and Regional Awards

Learn More and Nominate Someone Today
ashrae.org/honorsandawards

ASHRAE Technical Committees (TCs) and Volunteer Opportunities at ashrae.org/communities

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ASHRAE Leadership Presentation
2023 Winter Conference

ASHRAE Simplified Rules of Order & Quick Reference

ASHRAE SIMPLIFIED RULES OF ORDER & MEETING FUNDAMENTALS
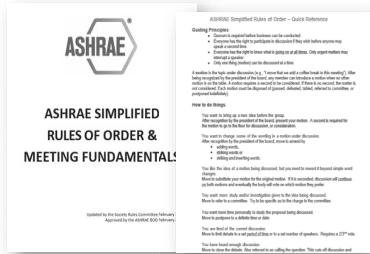
REMINDER! Councils and Committees should now be fully operational in the new ASHRAE Simplified Rules of Order meeting guidance.

Questions or comments regarding the new rules of order and quick reference?

Contact boardservices@ashrae.org

Download the rules and quick reference on the ASHRAE website

ashrae.org/communities/committees/society-rules-committee

ASHRAE Policies

Code of Ethics

"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 interest."

Harassment and Discrimination Policy

ASHRAE strictly prohibits and does not tolerate discrimination against members or applicants for membership because of such individual's race, color, religion, age, sex, sexual orientation, national origin, physical or mental disability, pregnancy, genetic information, veteran status, uniformed service member status, or any other category protected under applicable law.

Commercialism

ASHRAE's Commercialism Policy allows for Society activities that fulfill the mission of technological advancement with adherence to business plans that generate income to offset operational expenses such as AHR Exposition, ASHRAE periodicals, website, and Society conference events such as the Welcome Party, luncheons, registration kits, and receptions.
ashrae.org/commercialism

View ASHRAE Governing Documents at ashrae.org/about/governance

2022-23 Board of Directors
Directors-at-large

ASHRAE

Wade Conlan, P.E., BCxP
Maitland, Florida

Blake Ellis, P.E.
Overland Park, Kansas

Dru Crawley, Ph.D., BEMP
Washington, D.C.

Kenneth Fulk
Allen, Texas

Art Giesler
Colleyville, Texas

Wei Sun, P.E.
Ann Arbor, Michigan

Kishor Khankari, Ph.D.
Ann Arbor, Michigan

Luke Leung, P.E
Clarendon Hills, Illinois

Adrienne Thomle
Reno, Nevada

2022-23 Board of Directors
Executive Committee

ASHRAE

President
Farooq Mehboob, P.E.
Fellow ASHRAE,
Life Member
Karachi, Pakistan

President-Elect
Ginger Scoggins, P.E.
Raleigh,
North Carolina

Treasurer
Dennis Knight, P.E.
Fellow ASHRAE
Mt. Pleasant,
South Carolina

Secretary
Jeff Littleton
Peachtree
Corners, Georgia

Vice Presidents

Dunstan Macauley,
P.E., HBDP
Arlington, Virginia

Billy Austin, P.E.,
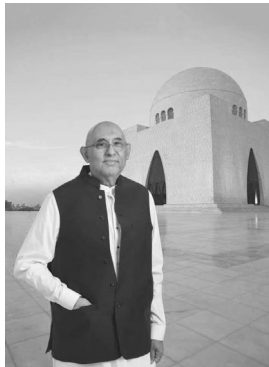BCxP, BEAP, BEAP,
HBDP, HFDP, OPMP
Charlotte, North Carolina

Sarah E. Maston,
P.E., BCxP
Hudson,
Massachusetts

Ashish Rakheja
Noida, Uttar Pradesh,
India

President's Luncheon + Board Meetings

ASHRAE

President's Luncheon
(Ticket Required)

Monday, 12:15 pm – 2:00 pm
Omni CNN Center, Grand Ballroom

Connect with attendees and hear
updates from Farooq Mehboob,
Fellow Life Member ASHRAE,
2022-23 ASHRAE President

**Board of Directors
Meetings**
Attend in person in the Omni
CNN Center, Grand Ballroom or
stream live (link in ASHRAE 365).

Sunday, 1:30 pm – 5:30 pm
Wednesday, 2:00 pm – 6:00 pm

2022-23 Board of Directors
Director and Regional Chairs

ASHRAE

Region I
Steven C. Sill
Sterling, New York

Region II
Ronald Gagnon
Quebec, Canada

Region III
Mark Tome, P.E., HFDP
Harrisburg, Pennsylvania

Region IV
Bryan Holcomb
Oak Ridge, North Carolina

Region V
James Arnold, P.E.
Dublin, Ohio

Region VI
Susanna Hanson
La Crosse, Wisconsin

Region VII
Chris M. Gray, Ph.D., P.E.
Atlanta, Georgia

Region VIII
Randy C. Schrecengost, P.E., BEAP
Austin, Texas

Region IX
Tyler J. Glesne, BCxP, BEAP
Omaha, Nebraska

Region X
Devin A. Abellon, P.E.
Los Angeles, California

Region XI
Eileen Jensen, P.E.
Vancouver, Washington

Region XII
John Constantinide, P.E.,
Merritt Island, Florida

Region XIII
Cheng Wee Leong, P.E.,
Singapore

Region XIV
Andres J Sepulveda
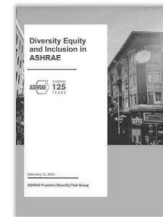Madrid, Spain

Region-at-Large
Richie Mittal
New Delhi, India

Society Snapshot

ashrae.org/society-snapshot

Diversity, Equity, & Inclusion (DEI) in ASHRAE
BOD Subcommittee created by the Board in January 2021

The purpose of the BOD DEI Subcommittee is to advise and engage the Board of Directors on:

- All matters relating to diversity, equity and inclusion - with a view to improving organizational awareness and performance in these areas amongst both staff and the Society membership
- The establishment of annual budgets for DEI program and ongoing initiatives
- The prioritization of inclusivity issues which have relevance to ASHRAE, together with plans for addressing these issues
- DEI training modules for Chapters and Committees are available at the DEI Training website available through the ashrae.org/DiversityEquityInclusion page. An ASHRAE login is required to access videos.

New Resources available at
ashrae.org/DiversityEquityInclusion

Members of the BOD DEI Subcommittee
Adrienne Thomle (Chair); Kishor Khankari (Vice Chair); Devin Abellon; Susanna Hanson; Wei Sun; Ashish Rakheja; Tanisha Meyers-Lisle (Staff Liaison); Billy Austin; Dennis Knight; Farooq Mehboob (Consultant)


Membership & Communities

10% Discount for Five New Employees

Employers who submit 5 or more new membership applications in a single transaction receive a 10% discount on Society dues owed.

Free Winter or Annual Conference Registration

New full dues paying members receive one complimentary registration to a Winter or Annual Conference.

FREE REGISTRATION to an Annual or Winter Conference
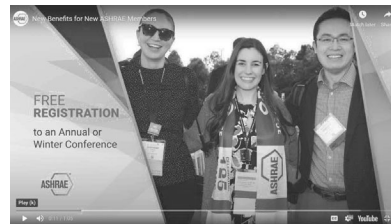
New! Quick video highlighting benefits on ASHRAEvideo YouTube channel and ashrae.org/benefits.

ashrae.org/membership

Task Force for Building Decarbonization

Through its Working Groups with over 100 volunteers from around the world the **Task Force For Building Decarbonization** (TFBD) is working to implement strategy, direction, and successful products and services for the industry relating to building decarbonization.

Products and Services Include:

- Seven Guides
- Creating content for a Knowledge Hub on ashrae.org
- Establishing relevant training & education

Email questions or input to **decarb@ashrae.org**

ashrae.org/decarb

Professional Development

eLearning	ASHRAE Learning Institute (ALI)	ASHRAE Certifications
90+ online courses starting at **$42** for members, and group rates are available. **elearningcatalog.ashrae.org**	**New schedule for 2023** In-person and virtual HVAC Design courses • Level I – Essentials • Level II – Applications **NEW** courses added to the Instructor-led Online Series **ashrae.org/onlinecourses**	**Building Design** • Energy Modeling (BEMP) • Healthcare Facility Design (HFDP) • High-Performance Building Design (HBDP) • HVAC Design (CHD) **Building Performance** • Commissioning (BCxP) • Energy Assessment (BEAP) **Building Operations** • Operations & Performance Maintenance (OPMP)

Sign Up for a Monthly Update at ashrae.org/professionaldevelopment

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Supporting ASHRAE's Mission
Thank You to all the **donors and volunteers** for your support

$3.1M Total Cash Raised*

$1M Raised for Endowments

$235,500 Awarded via 65 Scholarships

Research Promotion Campaign Total $2.5M
(Research, YEA, ALI, Scholarships, General)

Within the RP Campaign
$1.9M Raised for Research
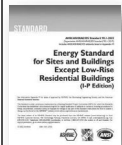
$1.1M Given by ASHRAE Regions, Chapters and Sections

More than 5,000 contributions from Members, Organizations and other Associations

Donate, Volunteer and Learn More at ashrae.org/support

Publications

Recently published items available at ashrae.org/bookstore

ANSI/ASHRAE Standard 90.1-2022, *Energy Standard for Sites and Buildings Except Low-Rise Residential Buildings*

ANSI/ASHRAE Standard 62.1-2022, *Ventilation and Acceptable Indoor Air Quality* **&** **ANSI/ASHRAE Standard 62.2-2022,** *Ventilation and Acceptable Indoor Air Quality in Residential Buildings*

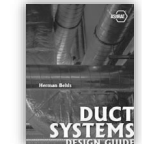*ASHRAE Pocket Guide for Air Conditioning, Heating, Ventilation, Refrigeration,* **10th Ed.**

Advanced Energy Design Guide for Multifamily Buildings – Achieving Zero Energy (AEDG)

Lucy's Engineering Adventure

Duct Systems Design Guide

Standard 241P: White House Ventilation Standard for Pathogen Mitigation (Non-ANSI Standard) **Target to Publish Fall 2023**
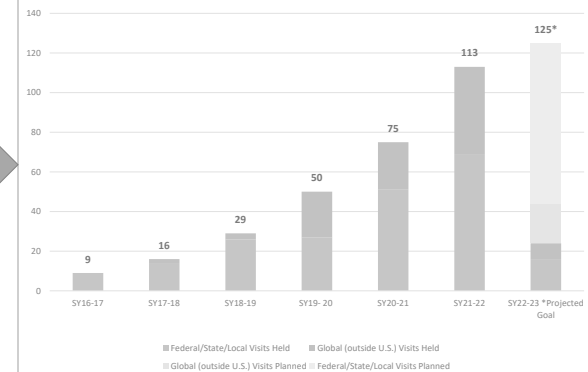

Government Affairs

Government Affairs Update: **Subscribe** online or by emailing GovAffairs@ashrae.org. 511 GAU articles were published in SY21-22; 249 published to date.

Government Outreach Events connect ASHRAE volunteers with policy-makers.

Letters, briefings, testimony, and comments are sent in support of ASHRAE's Public Policy Priorities: 39 sent in SY21-22; 10 sent in SY22-23.

Government Outreach Events

SY16-17	SY17-18	SY18-19	SY19-20	SY20-21	SY21-22	SY22-23 *Projected Goal
9	16	29	50	75	113	125*

■ Federal/State/Local Visits Held ■ Global (outside U.S.) Visits Held
■ Global (outside U.S.) Visits Planned ■ Federal/State/Local Visits Planned

Get Involved + Get Resources at ashrae.org/governmentaffairs

Upcoming Tradeshows

WHAT?	WHEN?	WHERE?
AHR Expo	February 6-8, 2023	Atlanta, GA
ACREX	March 14-16, 2023	Bombay
AHR Mexico	September 19-21, 2023	Mexico City
Greenbuild	September 26-29, 2023	Washington DC

➢ **Educational Resources**
➢ **Discounts on Publications**
➢ **Free ASHRAE Giveaways**

Come to the AHR Expo!
Your (paid) ASHRAE Winter Conference badge gets you into the show. Visit the **ASHRAE Booth B1638 & Bookstore C6043**.

Learn More and Find Resources for Tradeshows ashrae.org/marketingcentral

Resources

Find these resources and more at ashrae.org

ASHRAE Conferences

MAR 2023
ASHRAE SCANVAC HVACC Cold Climate Conference
Mar 6-8, 2023| Anchorage, AK
Mar 9-10, 2023| Fairbanks, AK

MAY 2023
Developing Economies Conference 2023
May 11-12, 2023| Mumbai, India

OCT 2023
2023 Decarbonization Conference for the Built Environment
October 25-27, 2023| Washington, DC

2023 ASHRAE Annual Conference
June 24-28, 2023 | Tampa, FL
Registration opens in March!

ashrae.org/conferences

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Created for the busy volunteer

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Find logos, Brand Guide, Acronym Guide and more!

ASHRAE Branding Guide

Flyers & Brochures | Videos | Toolkits | Tradeshows | Graphics

ashrae.org/marketingcentral

Thank you!
Questions or Comments?