MINUTES
ASHRAE TC 4.7 ENERGY CALCULATIONS – MAIN MEETING
WINTER 2020 VIRTUAL CONFERENCE
MON. FEB 1, 2021, 1:00 PM – 3:30 PM EDT

Action Items:

- **Muehleisen to submit recommended TPS change from 2020 annual meeting to TAC**
- **Muehleisen to create an ad hoc committee to create a Vision and MOB for presentation and voting at 2021 Annual Meeting.**

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Connection Instructions

Zoom: https://ashrae-org.zoom.us/j/95476680495?pwd=NFhkaDV6eUJWalBHUlo2TUU0MUJCUT09

Meeting ID: 954 7668 0495
Passcode: 892665
Find your local number: https://ashrae-org.zoom.us/u/aeGE9qBZXu

Call to Order and Introduction of Members (5 min, Muehleisen)

- Ralph Muehleisen, Committee Chair
- Neal Kruis, Committee Vice-Chair
- Alamelu Brooks, Secretary
- Brian Kastl, Committee Program Chair
- Joshua New, Committee Webmaster
- John Pruett, Committee Handbook Chair
- Tim McDowell, Committee Research Chair
- Joel Neymark, Committee Standards Chair
- Ron Judkoff, Multi-scale Building Modeling Subcommittee Chair

- Anthony Fontanini, Data-driven Modeling Subcommittee Chair
- Edwin Lee, Simulation and Component Models Subcommittee Chair

Attendance form https://forms.gle/fRmw8KuCPQ2ZyyC76 put in zoom chat

Reciting of Code of Ethics Commitment and Introductions (2 min, Muehleisen)

Commitment to the ASHRAE Code of Ethics: In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity and respect for others, and we shall avoid all real or perceived conflicts of interest.

Call of Voting Members (5 min, Kruis)

Present?	Last	First	Email
	Cook	Malcolm	malcolm.cook@lboro.ac.uk
	Crawley	Dru	dru.crawley@bentley.com
	Haberl	Jeff	jhaberl@tamu.edu
	Judkoff	Ron	ron.judkoff@nrel.gov
	Kim	Hyojin	hyojin.kim@njit.edu
	Kruis	Neal	neal.kruis@bigladdersoftware.com
	Muehleisen	Ralph	rmuehleisen@anl.gov
	Neymark	Joel	neymarkj@msn.com
	Pruett	John	jap@zmm.com
	Rao	Sagar	sagar.rao@outlook.com

Accept agenda & approve minutes of Austin meeting (2 min, Muehleisen)

Review TC 4.7 Scope (5 min, Muehleisen)

- We voted in Austin to change purpose to: **TC 4.7 identifies, evaluates, develops, and recommends procedures for calculating energy performance of the built environment.**

Ralph failed to submit the recommended change to TAC. Add action for Muehleisen to submit. We will review again at the next Annual meeting in Phoenix (or online).

Action Item: Muehleisen to submit previously approved recommended change to TAC

Membership (5 min, Muehleisen)

- Muehleisen submitted Roster updates promptly in July and most “took”. Still need to resolve outstanding PCM to CM conversions (Daniel Villa). Contact Muehleisen if you think you should have been converted.
- Conversion of PCM to CM is related to your activity in the committee - attendance at meetings and activity within committee functions (research, programs, handbook, etc). If you are a PCM and think you are ready to convert, contact Muehleisen and/or Kruis. PCM must convert to CM within 2 years or you roll off
- Voting roster is currently 10. Want to add one or 3 member to get an odd number (it’s easier to meet quorum).
    - Note: We are limited to one VM per company affiliation
    - Any current VM wanting to step down?
    - Any non current VM interested in stepping up

Announcements/Liaisons (20 min, Muehleisen)

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- Jamie Bennett (Section 4 Liaison)
- Natascha Milesi-Ferretti (Research Liaison)
- Bass Abushakra (Handbook Liaison)

- New Functional Group Evaluation Workbook (FGEW) is being used in conjunction with the regular TC Activities report to give more info to TAC. This is something that has come out of the previous discussions to streamline working groups. We will give a self assessment of how we are doing in many regards to our TAC Liaison (Jamie) who reviews it and uses it as input to his assessment of the WG.
  On the whole TC 4.7 looks to be doing great. Our biggest problem is something completely fixable - getting Agenda out well in advance of meetings. In everything else (web page, minutes, research, programs, standards, handbook) we are doing really well.

- All FG are being asked to develop a "Vision" and a set of "Measureable Objectives" (MOBs). I'll need to clarify how/why the Title, Purpose, Scope, isn't clear enough.

Action Item: Muehleisen to create an ad hoc committee and schedule a meeting in March or April to develop a Vision and MOBs and to be able to present and vote on at Annual Meeting.

Subcommittee Reports (60 min, Various)

- New Subcommittee has been formed: Honors and Awards. Jeff Haberl will chair. Ralph Muehleisen, Dru Crawley, and Ron Judkoff have agreed to be on the committee. Task is identifying and nominating qualified people for the various ASHRAE awards. Muehleisen recommends that the current TC Chair always be a committee member.

- Historical — Haberl
  - This is not an official subcommittee and maybe we should just combine this with Honors. It can be Honors, Awards, and History (so that it's acronym is HAH 😁)

- Web Site (*https://tc0407.ashraetcs.org/*) — New

- Program — Kastl

- Research — McDowell

- Standards — Neymark
  - Important Info: TC 4.7 has recommended that Standard 209 be revised and a standing standards project committee (SSPC) be formed. Jason Glazer, previous chair of 209, has volunteered to chair again. IBPSA wants to co-sponsor/co-author (like IES does with 90.1) and not just be an institutional member of the SPC.

- Handbook — Pruett

- Data-Driven Modeling (DDM) — Fontanini

- Simulation and Component Models — Lee

- Multiscale Building Energy Modeling — Judkoff

Related Activities Reports (10 min, Various)

- 90.1
- TC 4.1
- TC 4.2
- TC 4.4
- TC 7.6
- IBPSA
- Others

New business (Muehleisen)

Adjourn (Muehleisen)

Upcoming Meetings

- January 25, 2021 – Virtual Chicago, IL
- June 26, 2021 – Phoenix, AZ (looking more and more like it will be virtual)
- January 31, 2022 – Las Vegas, NV
- June 25, 2022 – Toronto, ON

Appendix A: Resources

- ASHRAE's Research Proposal Process:
  - https://www.ashrae.org/file%20library/technical%20resources/research/ashrae-research-flowchart-r6.pdf
- 4.7 Committee Home Page:
  - http://tc0407.ashraetcs.org/
- 4.7 BaseCamp Page:
  - https://3.basecamp.com/3106353/projects/8174587

Appendix B: 2021 Winter (Chicago) Program Tracks

1. **HVAC&R Fundamentals and Applications:**
   - Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychrometrics, fluid and mass flow. This track provides opportunities for papers and presentations of varying levels across a large topic base. Concepts, design elements and shared experiences for theoretical and applied concepts of HVAC&R design are included.
2. **Systems and Equipment:**
   - HVAC&R Systems and Equipment are constantly evolving to address the changing requirements of the built environment. Papers and programs in this track will focus on the development of new systems and equipment, improvements to existing systems and equipment and the proper application and operation of systems and equipment.
3. **Refrigeration and Refrigerants:**
   - Refrigeration is a critical element of modern life, from preserving food and medicine to maintaining comfort. With significant changes on the horizon for refrigerant regulations, along with new applications for refrigeration systems being frequently applied, there is more need than ever to understand both the fundamental and advanced concepts and issues related to refrigeration. Papers and programs in this track will focus on refrigerants, refrigerant regulation, refrigeration cycles and refrigeration applications.
4. **Environmental Health Through IEQ:**
   - HVAC&R systems play a significant role in maintaining indoor environmental conditions. As people spend increasingly more time in the built environment, health concerns are becoming paramount to design. This track will seek papers and programs on developing, evaluating and predicting optimal indoor environmental conditions, especially as they pertain to environmental health.
5. **Building Performance and Commissioning for Operation and Management:**
   - Modern HVAC&R systems are complicated and designed for high efficiencies. In order to optimize their use and provide proper operation, commissioning is recommended. This track provides an opportunity to provide papers and presentations surrounding building operation and commissioning practices as well as case studies in performance and commissioning.

6. **Energy Conservation:**
    - Whether it is new construction, renovation, routine maintenance or energy audits there is a major concern over the use of energy in the built environment. Designs are using more techniques to reduce energy with the use of energy wheels and pipes, solar energy, photo voltaic, and more efficient equipment and new concepts that are pushing to be standard design practice. In addition, modeling is being used to generate more life cycle cost decisions for the design and value-engineering decisions beyond standard HVAC practice. This track will highlight case studies and research that expand on the simple to the complex energy savings measures being implemented in today's and tomorrow's designs.
7. **International Design:**
    - Design for various environmental elements, geography and culture demand that new and innovative strategies be developed. As an international organization, ASHRAE strives to meet the needs of a global membership. HVAC&R systems vary globally and this track provides an opportunity to share innovative and necessary design elements that can be shared internationally.
8. **Standards, Guidelines and Codes:**
    - ASHRAE is known for its standards and design guidelines – and they are constantly evolving with the intent on improving the built environment and its systems. Designers, Contractors, Architects and Owners must be able to keep up with the continuing changes in the current cycle but to also be prepared for the future changes. In addition, there is a large interaction of ASHRAE with the code authorities and government to incorporate these standards and guidelines. The series of sessions in this track highlight the changes to the standards and guidelines, their projected path and optimum design techniques to meet or exceed the standards.

Appendix C: 2021 Annual (Phoenix) Program Tracks

Track	Description	Chair
1	**Fundamentals and Applications:** Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychometrics, fluid and mass flow. This track provides opportunities for papers and presentations of varying levels across a large topic base. Concepts, design elements and shared experiences for theoretical and applied concepts of HVAC&R design are included.	Sonya Pouncy sonyapouncy@gmail.com
2	**HVAC&R Systems and Equipment**: HVAC&R Systems and Equipment are constantly evolving to address the changing requirements of the built environment. Papers and programs in this track will focus on the development of new systems and equipment, improvements to existing systems and equipment and the proper application and operation of systems and equipment.	Rupesh Iyengar rupesh_iyengar@yahoo.com
3	**Research Summit**: Active research, and the exchange of those research findings, are critical to the development of our HVAC&R industry and built environment. The 8th annual research summit invites researchers to share those results, including ASHRAE-sponsored research and research of interest to the ASHRAE community. Researchers are invited to present papers, extended abstracts, seminars, forums or participate in panel discussions. The Research Summit includes a partnership with ASHRAE's archival journal, Science and Technology for the Built Environment	Kristen Cetin cetinkri@msu.edu
4	Professional Development: As members of a professional organization, we not only participate for the great value of technical exchange, but also the interpersonal exchange. We recognize that the single greatest strength of our organization is its membership. This track is designed to allow those professionals an opportunity to develop in the areas of presentation skills, leadership, team-building, understanding various business operations, interpersonal skills, etc. In short, the Professional Development Track will cover all aspects of business outside of engineering/technical applications and lends itself to interactive session types such as workshops and forums	Marites Calad mcalad@norman-wright.com
5	Design, Control, and Operation of Critical Environments: Critical environments often present design, control, and operation challenges that require innovation, attention to detail, and a thorough understanding of the intended operational parameters. This track includes innovative designs and strategies that adapt to	Raul Simonetti raul.simonetti@carel.com

	the standards and special requirements presented by healthcare, cleanrooms, data centers, laboratories, isolation rooms, and pharmacies. Papers and presentations will also address how controls systems, smart building technologies, and security systems and other technologies are adapting to the emerging needs of critical environments.	
6	HVAC&R for Indoor Plants & Animals: This track addresses HVAC&R systems design for controlled environments that host plants & animals. Papers and programs in this track will present the challenges and opportunities associated with energy and water utilization for indoor growing spaces, including standards and regulations that guide the design of plant & animal habitats. Environmental parameters for indoor agriculture, including controlling temperature, humidity, air movement, air quality will be covered. This track will also address reducing consumption of energy & water and compare how crop types and animal species impact HVAC analysis and design.	Ryan MacGillvray ryan.macgillivray@dwel.com
7	Future Proofing - Renewable, Regenerative, and Resilient: The HVAC&R industry faces many challenges including climate change, pandemics, natural disasters, catastrophic accidents, and terrorism. Rising to meet these challenges are a host of technologies and strategies, including grid-enabled buildings, demand response, decarbonization, resiliency, zero energy design, energy-efficiency and renewable energy systems. This track invites papers, abstracts, seminars and forums that highlight the innovative technologies and strategies that are reimagining our relationship with the built environment now and into the future	Andy Cochrane acochrane@industrialairinc.com
8	Hot, Hot, Hot The world is warming. The built environment faces increased challenges to meet the demand for comfortable Indoor and outdoor environments in warmer climates. This track is for papers and presentations that address humidity control, outdoor cooling, passive cooling, water scarcity considerations, other design opportunities, and innovative technologies that help HVAC&R professionals adapt to the hottest climate trends.	Nohad Boudani nohadb@inco.com.lb