



**1791 Tullie Circle, N.E./Atlanta, GA 30329  
404-636-8400**

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

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

TC/TG/MTG/TRG No. TC8.5 DATE 6/18/2020

TC/TG/MTG/TRG TITLE Liquid to Refrigerant Heat Exchangers

DATE OF MEETING 6/18/2020 LOCATION On-Line

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE	
Satheesh Kulankara	7/1/2016	Bryce Moore	7/1/2018	Nicholas Zupp	Omar Abdelaziz
Joseph Huber	7/1/2016	Kaushik Oza	7/1/2018	Adnan Ayub	Stefan Ebel
Kashif Nawaz	7/1/2017			Minoo Mehdizadeh	Steven Eckels
Evraam Gorgy	7/1/2018			Pedro Perez	Yiron Jiang
Achim Gotterbaum	7/1/2017			Daniel Almeida	Christopher Seeton
Michael Wilson	7/1/2017			Ali Behfar	Jay Kohler
Lorenzo Cremaschi	7/1/2016			Andreas Knoepfler	Joshua Meyer
Stanislav Perencevic	7/1/2019			Ben Dingel	
Vikrant Aute	7/1/2019			Dhruv Hoysall	
				Guru Ravi	
				Ken Schultz	
				Liping Liu	
<b>DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:</b>					
TAC Section Head: Kevin Mercer				SHx@ashrae.net Where x is the section number	
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)				See ASHRAE email alias list for needed addresses.	
Mike Vaughn, Manager Of Research & Technical Services				MORTS@ashrae.net	

Note: These draft minutes have been approved by the committee during the Winter 2021 meeting.

TC 8.5: Liquid to Refrigerant Heat Exchangers  
ASHRAE 2020 Summer Meeting  
Thursday, Jun 18 2020, 11:00 AM – 2:00 PM US EDT

1. Call to order at 11:04 and reading of TC 8.5 scope read by S. Kulankara:

- *TC 8.5 is concerned with the thermal and mechanical design, performance, and application of devices for accomplishing heat transfer between refrigerants (including secondary refrigerants) and liquids.*
- Introduction of members and guests – skipped due to online nature of meeting

2. ASHRAE Code of Ethics Commitment read by S. Kulankara

*“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 interests. (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>)*

2a. Chair reviewed basic agenda – no comments

3. Establish quorum requirements (S. Kulankara) - 9 present, 3 absent see cover sheet

4. Review/approve minutes from previous meeting (S. Kulankara)

- Votes For 9 / Against 0 / Abstain 0 / 3 Not present
- Adnan Ayub motioned to approve
- Vikrant Aute seconded
- No discussion

5. Section Head comments

6. Liaison comments

Research Liaison Christopher Seeton was present.

- There will be a funding shortfall this year due to missing a variety of functions that fund ASHRAE research as a result of the pandemic.
- New RP will not be approved after the August meeting. Are hoping to be able to fund most of RP's in queue.
- Make sure a queue of RTARs are available when funding resumes.

7. Membership subcommittee report (Sateesh Kulankara)

- New roster will take effect for 2020-2021 will be effective 1 August 2020
- 89 members/ 12 voting members
- 2019-2020 roster and officer review
  - Lorenzo Cremaschi, Joseph Huber and Sateesh Kulankara will be rolling off as voting members
  - Mino Mehdi-zadeh and Pedro Perez and will be rolling on as voting members on 1 August
  - There are now two members listed from Standard Refrigeration, Sateesh Kulankara will take this up with ASHRAE

TC 8.5: Liquid to Refrigerant Heat Exchangers  
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- 2020-2021 roster and officer review
  - Bryce Moore has left ASHRAE so Joe Huber will become Chair, and voting member, instead of Vice Chair
  - Satheesh will take on role of Vice Chair to assist Joe
  
- 8. Handbook subcommittee report (Adnan Ayub)
  - Systems and Equipment: Condensers, Liquid Coolers
    - Changes to chapter were voted on by e-mail last march with only one abstention
  
- 9. Program subcommittee report (Minoo Mehdizadeh)
  - Our TC does not have program for this summer's meeting
  - For winter we would like to submit a seminar, have two potential topics
    - Deadline is August 3<sup>rd</sup> for submission of topics
    - Looking into a seminar on plate heat exchangers, 2 possible presenters identified
      - Nothing confirmed for this yet
      - Under Track 2 Systems and Equipment
    - Would like to present results of "Fouling RP" 1677-RP as part of a program
      - Also doing a submission to the STBE Journal
      - Plan to have 2 presentations from the Research Project
      - Look for TC1.3 to co-sponsor the seminar
      - Vikrant will look for another speaker
  - Minoo Mehdizadeh will contact presenters and establish a Title for the possible seminars and send an e-mail ballot request to Satheesh for the committee to consider
  - There are two seminars we have been asked to co-sponsor
    - Two possible titles
      - A2L refrigerant effects on design and refrigerant equipment sizing
      - One on droplet movement in AC systems
    - Discussion followed: The A2L seminar being within our TC's scope; The droplet movement seminar is probably not within our scope.
    - Minoo will follow up to get more details of the A2L seminar
  - Satheesh mentioned the Virtual program
  
- 10. Standards subcommittee report (Joe Huber)
  - Committee responsible for
    - Std 22
    - Std 24
    - Std181

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- All standards are recent and have a few years until they require a re-affirmation/update/withdraw vote
11. Webmaster report (Pedro Perez)
- Website is up to date
  - All attendees are encouraged to check out the website for information
  - Website: <https://tc0805.ashraetcs.org/>
12. MTG Liaison (Satheesh Kulankara)
- Refer to Chair's presentation for notes
13. Research subcommittee report (Kashif Nawaz)
- Update from the Research Sub-Committee Breakfast Meeting
    - Scheduled for next month
    - After meeting notes from this meeting will be sent to chair to be included in the TC minutes as an addendum
  - 1677-RP: "Measurement and prediction of waterside fouling Performance of Internally Enhanced condenser Tubes Used in Cooling tower Applications" (Ben Dingel)
    - Nearing completion
    - Final report has been submitted to PMS, PMS reviewing draft of final report
    - Will be circulated to the committee for approval in the next few weeks
    - Will publish multiple papers out of this effort
      - Both on research process and modelling of fouling
    - Would like the PI to have a final presentation with a question and answer session
      - Recommended an open seminar with question and answer session
      - Will consider a virtual seminar (ASHRAE can set this up)
  - 1800-RP: "Spray Evaporation on Enhanced Tube Bundles with Low GWP Pure Refrigerants and Refrigerant/Miscible Oil Mixtures" (Adnan Ayub)
    - Main TC sponsoring is TC1.3
    - Principal Investigator is Lorenzo Cremaschi
    - Had issues with tube samples initially received, has been taken care of
    - Is taking care of troubleshooting test apparatus
    - Due to COVID-19 there is some difficulty getting the testing started
      - There may be a delay of a year or so due to these issues
  - TRP-1731: "Heat Transfer Performance of Medium Pressure Lower GWP Refrigerants in a Flooded Evaporator Comprising an Enhanced Tube Bundle" (Kashif Nawaz)
    - There is no update on this request from RAC
    - This TRP has been ready for consideration by RAC
    - Christopher Seeton will find out what needs to be done to get this into process
  - Other RTARs and Work Statements

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- There are 4 RTARs in process of being written
  - Heat Transfer measurements & correlation development for tube in tube fluted / coaxial HXs
    - Potential for 2 RTARs one on Condensation and one on evaporation
    - Mike Wilson to finish proposal and send to
    - If there is an abstract it would be a god idea to pass it on to research liaison for feedback
  - External condensation on tube bundle with lower GWP refrigerants. Potentially include impact of non-condensable at concentrations above, at and below AHRAI allowable limits
    - Ben and Achim are working on this to turn their notes into a draft RTAR
    - Target have RTAR ready by next meeting
    - If there is an abstract it would be a god idea to pass it on to research liaison for feedback
  - Potential RTARs:
    - CO2 boiling on outside of tubes
    - CO2 condensing
    - In tube evaporation of low GWP refrigerants
  - RTAR for CO2 condensation on tubes applicable to cascade systems
    - RTAR draft was written a long time ago
    - Kashif Nawaz to find out status and move this RTAR on as appropriate
  - New topics for research
    - Please send any ideas for future research to Kashif so it can be considered by the TC

14. Chairman's report (Satheesh Kulankara)

- Refer to Chair's presentation for notes

15. New Business

- No new business
- Satheesh thanked the committee for their activity and support during his term as chair
- Several members of the committee thanked Satheesh for his work as chairman

16. Schedule Next meeting: Monday, Jan 25 2021, 4:15 PM to 6:30 PM – Chicago, IL

17. Adjourn

Motion to adjourn meeting made by Lorenzo Cremaschi

Motion seconded Kashi Nawaz

Unanimous agreement by voting members

18. Addenda:

- Attendance list from Zoom meeting
- Chairs presentation

TC 8.5: Liquid to Refrigerant Heat Exchangers  
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Addenda: Attendance list from Zoom meeting.

<b>Z</b>	ZuppNG (Me)	 
<b>SK</b>	Satheesh Kulankara	  
<b>I</b>	iPhone	 
<b>KN</b>	Kashif Nawaz	 
<b>PP</b>	Pedro Perez	 
<b>A</b>	Achim	 
<b>A</b>	Adnan	 
<b>AB</b>	Ali Behfar	 
<b>AK</b>	Andreas Knoepfler	 
<b>BD</b>	Ben Dingel	
<b>CS</b>	Chris Seeton - RAC Liaison	 
<b>DA</b>	Daniel Almeida	 
<b>DH</b>	Dhruv Hoysall	 
<b>EG</b>	Evraam Gorgy	 
<b>GR</b>	Guru Ravi	 
<b>J</b>	J	 
<b>JB</b>	Jim Bogart	 
<b>JH</b>	Joe Huber	 
<b>KS</b>	Ken Schultz	 
<b>LL</b>	Liping Liu	 
<b>LC</b>	Lorenzo Cremaschi	 
<b>MW</b>	Mike Wilson	 
<b>M</b>	Minoo	 
<b>NL</b>	Neal Lawrence	 

TC 8.5: Liquid to Refrigerant Heat Exchangers  
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Addenda: Attendance list from Zoom meeting.

	Omar Abdelaziz		
	Stanislav		
	Stefan Elbel		
	Steven Eckels		
	Yirong Jiang		



# TC 8.5: Liquid to Refrigerant Heat Exchangers

Virtual Meeting – Thursday June 18, 2020

## Welcome to TC 8.5 June 2020 Virtual Meeting

- **Audio**

- Attendees are muted upon entry
- Do not un-mute your line
- If you are joining via computer and phone line, ensure both are muted

- **Video**

- You are welcome to share your webcam
- Be mindful that you are on display! Turn off your video when needed.
- This meeting is recorded for future reference

- **Q&A**

- Use the chat function to ask questions



## TC 8.5 Scope

- TC 8.5 is concerned with the thermal and mechanical design, performance, and application of devices for accomplishing heat transfer between refrigerants (including secondary refrigerants) and liquids.



## ASHRAE Code of Ethics

- As members of ASHRAE or participants in ASHRAE activities, we pledge to act with honesty, fairness, courtesy, competence, integrity and respect for others in our conduct. We will avoid conflicts of interest, and behavior that is discriminatory and/or harassing.
- See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>



## Agenda

- Establish quorum requirements (Satheesh Kulankara)
- Section Head Comments (Kevin Mercer)
- Liaison Comments
- Review/Approve minutes from Orlando meeting (Satheesh Kulankara)
- Membership (Kash Oza/Satheesh Kulankara)
- Handbook Subcommittee (Adnan Ayub)
- Program Subcommittee (Minoo Mehdizadeh)
- Standards Subcommittee (Joseph Huber)
- Webmaster (Pedro Perez)
- Research Subcommittee (Kashif Nawaz)
- MTG Liaison: Low GWP Refrigerants (Satheesh Kulankara –Liaison)
- Chair Comments (Satheesh Kulankara)
- New Business
- Next meeting: Tuesday, January 26, 2021 @ 1:00-3:30PM in Chicago, IL.
- Adjourn



## Establish of Quorum

Voting Member	Present	Absent
Vikrant Aute		
Adnan Ayub		
Lorenzo Cremaschi		
Evraam Gorgy		
Achim Gotterbarm		
Joseph Huber		
Satheesh Kulankara		
Bryce Moore		
Kashif Nawaz		
Kaushik Oza		
Stanislav Perencevic		
Michael Wilson		

All other attendees please send the chair an e-mail with your affiliation to indicate your presence at the meeting:  
TC0805@ashrae.net



## Section Head/Liaison Comments

- Section Head: Kevin Mercer
- Handbook Liaison: Prakash Dhamshala
- Standard Liaison: Srinivas Katipamula
- Research Liaison: Christopher Seeton



## APPROVAL OF MINUTES FROM ORLANDO MEETING

- Draft meeting minutes from Orland were circulated to TC 8.5 and can also be found on TC 8.5 website
  - <https://tc0805.ashraetcs.org/>
- Motion to approve the minutes
- Discussion/Changes to Minutes
- Vote to approve the draft minutes



## TC Membership

- 2020-2021 SY roster is effective Aug 1, 2020
- 2019-2020 SY roster
  - 89 members
    - 12 voting members
    - 64 corresponding members
    - 13 provisional corresponding members
  - 25 out of 89 members are YEA members
- Voting members with terms ending after 2019-2020 SY
  - Lorenzo Cremaschi
  - Satheesh Kulankara
- New voting members starting with 2020-2021 SY
  - Icksoo Kyung
  - Minoo Mehdizadeh
  - Pedro Perez



## TC Membership

- **New Proposed Chair: Joseph Huber**
  - Bryce Moore was proposed as the incoming TC 8.5 chair after Orlando meeting
  - Bryce left the HVAC industry recently
  - Emergency roster change process initiated as a result in early May
- **New Proposed Vice-Chair: Satheesh Kulankara**
- **New Proposed Secretary: Nicholas Zupp**
- All subcommittee chairs and webmaster continuing from 2019-2020 SY
- Roster for 2020-2021 SY is still being finalized by ASHRAE





# TC 8.5: Liquid to Refrigerant Heat Exchangers

Handbook Subcommittee Update – Adnan Ayub

## Handbook Sub-committee

- Updated Chapter 42 of Systems and Equipment with a new section for falling film evaporators and updated section for flooded evaporators with results from RP-1556.
  - E-mail ballot in March 2020 for approving the draft sections that were previously circulated
    - Updated sections approved: 10-0-0-CNV (no response from one member)





# TC 8.5: Liquid to Refrigerant Heat Exchangers

Program Subcommittee Update –  
Minoo Mehdizadeh

## Program Sub-committee

### Tracks for Austin/2020 Virtual

- Track 1: Fundamentals and Applications
- Track 2: HVAC&R Systems and Equipment
- Track 3: Research Summit
- Track 4: Professional Development
- Track 5: Grid-Interactive Efficient Built Environment
- Track 6: Multifamily and Residential Buildings
- Track 7: Resilient Buildings and Communities
- Track 8: Zero Energy Buildings and Communities: Opportunities and Challenges



## Program Sub-committee

- **2020 Summer Virtual Conference**
  - On demand technical program available June 22
    - 80 sessions accessible for 18 months
    - Technical and Conference papers can be downloaded
  - Live sessions are scheduled between June 29 – July 2
    - 12 technical sessions presented live and available for download
    - Live forums for Q&A
    - Live chat with speakers from the on demand section
    - Virtual networking happy hours



## Program Sub-committee

### Tracks for Chicago

- i. Track 1: HVAC&R Fundamentals and Applications
- ii. Track 2: Systems and Equipment
- iii. Track 3: Refrigeration & Refrigerants
- iv. Track 4: Environmental Health through IEQ
- v. Track 5: Building Performance and Commissioning for Operation and Management
- vi. Track 6: Energy Conservation
- vii. Track 7: International Design
- viii. Track 8: Standards, Guidelines and Codes
- ix. Track 9 (mini-track) based on Chuck Gulledge's Presidential Theme (to be announced and not accepting papers).



## 2021 Winter Conference - Chicago

### Deadlines:

**Monday, June 15, 2020:** Website Opens for Seminar, Workshop, Forum, Debate, and Panel Proposals

**Wednesday, July 8, 2020:** Final Conference Papers Due - Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment); Request for Conference Paper Sessions Due

**Monday, July 27, 2020:** Conference Paper Accept/Revise/Reject Notifications

**Monday, August 3, 2020:** Website Closes for Seminar, Workshop, Forum, Debate, and Panel Proposals

**Monday, August 10, 2020:** Revised Conference Papers/Final Technical Papers Due

**Monday, August 24, 2020:** Conference and Technical Paper Final Accept/Reject Notifications

**Monday, October 5, 2020:** Seminar, Workshop, Forum, Debate, and Panel Accept/Reject Notifications



## Program Sub-committee

- Discussion on topics for future programs





# TC 8.5: Liquid to Refrigerant Heat Exchangers

Standards Subcommittee Update –  
Joseph Huber

## Standards Sub-committee

- ANSI/ASHRAE Standard 22 - Methods of Testing for Rating Liquid-Cooled Refrigerant Condensers
  - Current version 2018
- ANSI/ASHRAE Standard 24 - Methods of Testing for Rating Evaporators Used for Cooling Liquids
  - Current version 2019
- ANSI/ASHRAE Standard 181 - Methods of Testing for Rating Liquid to Liquid Heat Exchangers
  - Current version 2018
- Discussion on Standards





## TC 8.5: Liquid to Refrigerant Heat Exchangers

Webmaster Update – Pedro Perez

TC 8.5 Website: <https://tc0805.ashraetcs.org/>



## TC 8.5: Liquid to Refrigerant Heat Exchangers

Research Subcommittee Update –

Kashif Nawaz

## Research Sub-committee

- General research subcommittee updates



## Research Sub-committee – On going activities

- RP-1677 – Fouling performance of internally enhanced condenser tubes used in cooling tower applications
  - PMS reviewing latest version of draft final report
- RP-1800: Spray Evap. on Enhanced Tube bundles with low GWP Pure ref. and ref./miscible oil mixtures
- TRP-1731 – Heat Transfer Performance of Medium Pressure Lower GWP Refrigerants in a Flooded Evaporator Comprising an Enhanced Tube Bundle



## Research Sub-committee – Potential Future Activities

1. Heat transfer measurements & correlation development for tube-in-tube fluted/coaxial tube HXs
  - Potentially 2 RTARS: one for evaporation and one for condensation
2. External condensation on tube bundle with lower GWP refrigerants. Potentially include impact of non-condensibles at concentrations above, at and below AHRI allowable limits
3. Potential RTARs: CO<sub>2</sub> boiling/evaporative condenser/In-tube evaporation of low GWP
4. RTAR for CO<sub>2</sub> condensation on tubes applicable to cascade systems
5. New ideas/topics for research



## TC 8.5: Liquid to Refrigerant Heat Exchangers

MTG. LOW GWP Refrigerants Update –  
Satheesh Kulankara

## MTG.Low GWP Refrigerants - Programs

- Programs at Orlando conference
  - One seminar sponsored by MTG
- Programs for future conferences
  - MTG co-sponsored a seminar for Austin from TC 8.2 titled “Application of Low GWP Refrigerants in Centrifugal Chillers”
    - Looks like this seminar was withdrawn after being accepted
  - Virtual Conference Seminar 13: Low Global Warming Potential Refrigerants for Direct HVAC Applications at virtual conference
  - Considering a session with results from RP-1806 and some AHRI research results for Chicago. Decision at the summer virtual meeting
  - TC 10.1 and TC 10.5 is considering a seminar for Chicago and would like co-sponsorship from MTG. Details to be discussed at the summer virtual meeting



## MTG.Low GWP Refrigerants – Codes and Standards

- Focus on technical documentation to disseminate to state and local jurisdictions
- Slide deck for advocacy plan for code related issues
- Stakeholder list for code related issues



## MTG.Low GWP Refrigerants – Codes and Standards

- Standard 15.2 (residential applications) draft published to seek public comments
- Standard 34 continues to add new lower GWP refrigerants
- AHRI now has a “Safe Refrigerant Transition Task Force”
  - Details on AHRI website



## MTG.Low GWP Refrigerants - Research

- Research subcommittee meeting on May 26
- RP-1806 Flammable Refrigerants Post-Ignition Simulation and Risk Assessment Update
  - New work plan approved by PMS with some additional experimental work
  - Expected to be completed by the end of 2020
  - Decision on further steps after completion of the currently approved work
- RP-1855 Determination of the Impact of Combustion Byproducts on the Safe Use of Flammable Fluorinated Refrigerants
  - Literature review project
  - Draft report under review



## MTG.Low GWP Refrigerants - Research

- WS-1884 The incorporation of odorants in refrigerants to improve leak detection – Phase II experimental study
  - Follow up from TRP-1794 literature review project
  - Potential co-funding from US CPSC
- Research outside ASHRAE
  - Many AHRI research projects are now complete and reports are available from AHRI
  - DOE has a project to evaluate the basis for setting charge limits for flammable refrigerants (A2L, A2 and A3)
    - Simplified models for estimating safe refrigerant charge quantity based on extensive CFD analysis



## TC 8.5: Liquid to Refrigerant Heat Exchangers

TC Chair Comments –  
Satheesh Kulankara

## TC Chair Comments – Announcements

- TC/TRG/MTG meetings are spread out over June and July for the virtual conference
- Subcommittee chairs' meetings such as research, program are occurring after the main TC meeting in many cases
- Roster updates effective only after the completion of all meetings



## TC Chair Announcements - ASHRAE COVID-19 TASKFORCE

- Epidemic Task Force formed to deploy ASHRAE's resources to address the COVID-19 pandemic
  - Review all technical questions/requests for technical guidance submitted
  - Coordinating activities of ASHRAE's internal resources
  - Partnering with and monitoring the activities of external organizations, including the more than 60 members of the ASHRAE Associate Society Alliance (AASA) of organizations related to the HVAC&R industry around the world
  - Reviewing, organizing, consolidating and publishing clear and concise summaries with citations of the most relevant information available to the built environment
  - Representation from over 50 TCs
- ASHRAE Resources at: [www.ashrae.org/covid19](http://www.ashrae.org/covid19)



## TC Chair Comments – TAC Update

- TC re-org ad-hoc committee has submitted a report to TAC
  - TAC has formed a subcommittee to evaluate and implement recommendations from the report
  - TAC has approved 4 TC mergers – 3.2 & 3.3, 8.10 & 8.12, 9.4 & 9.8, 7.3 & 7.8
- New MTG.CYB (Cybersecurity for HVAC Systems and Related Infrastructure) has been formed since the Orlando meeting
- GEORGE B. HIGHTOWER Technical Achievement Award Nominations are due September 1
  - Nominated by TCs in recognition of exceptional service in the area of technical leadership and technical contribution **in the past four years**
  - Please let the chair know if you would like to nominate



## TC Chair Comments – CEC and PDC Updates

- CEC has a standing request for future meeting program track suggestions
- CEC is looking for TC Volunteers willing to support content development and quality control for society technical programs
- The Professional Development Committee (PDC) is actively seeking ideas for new ASHRAE Learning Institute (ALI) courses
  - Practical courses of broad interest to be presented as face-to-face seminars or short courses, instructor-led online courses and self-paced courses



## TC Chair Comments – RAP Survey Update

- Research Advisory Panel (RAP) survey
  - The survey received over 700 responses
  - Thank you to TC 8.5 members who responded
  - Derived 7 Initiatives (Working Titles)
    - Understanding IEQ and Impact on Productivity, HVAC airborne pathogen transmission and control
    - Education and Outreach
    - Sustainability – Energy and Resources
    - Resilience for buildings and communities
    - Tools and Standards
    - HVAC Components including new refrigerants
    - Leveraging ASHRAE Research
  - Working to coordinate with research strategic plan



## TC Chair Comments - RAC Update

- Typically \$2.6M - \$2.7M per year
  - Donations
  - Research Promotion sponsored events
  - AHR Expo contribution
- Funds collected in a given SY becomes RAC budget in next SY
- Funds:
  - Research Projects – 12-15 new projects per year
  - Grants and Awards
    - Innovative Research Grants (\$125k over 3 years)
    - New Investigator Award (\$125k over 3 years)
    - Grant In Aid – Typically 20-25 per year @ \$11,500



## RAC Update - Impact from Covid-19

- Reduced revenue from closures, cancellations, austerity
- Top Priority: Ensure continuity of core function
  - TC developed research addresses members most direct needs
- Unsolicited Research Projects (URPs) will not be considered for now
- Grants and awards will be delayed until budget is approved, may be suspended
- Please consider making a donation to ASHRAE research!



## TC Chair Comments – REF CPCC Committee Updates

- Refrigeration Technology Committee for Comfort – Process – Cold-Chain – REF CPCC has formed 7 new subcommittees
  - Goal is to bring more focus on refrigeration applications
  - Awards Subcommittee - Chair: Ayman Eltalouny
  - Cold-Chain Subcommittee – Chair: Dustin Lilya
  - HVAC Subcommittee – Chair: Walid Chakroun
  - Program Subcommittee – Chair: Steven Gill
  - Research Subcommittee – Chair: Yunho Hwang
  - R in ASHRAE Subcommittee – Chair: Didier Coulomb
  - Ref. Tech Report Subcommittee – Chair: Martin Dieryckx



## TC Chair Comments – Residential Buildings Committee Update

- Mission is to help ASHRAE have a greater impact in the residential space
  - Internally – help coordinate and facilitate residential activities that help stakeholders
  - Externally – communicate with stakeholders to identify needs and disseminate ASHRAE products
- In the process of analyzing input from external stakeholders regarding priority needs of the residential sector
  - Identify those suited to ASHRAE
  - Prioritize
- In the process of identifying priority TCs for residential activities but which do not have current RBC member – will seek formal liaison



## New Business

- 



## Set Next Meeting/Motion to Adjourn

- Next Meeting
  - Monday, Jan 25 2021, 4:15 PM to 6:30 PM – Chicago, IL
- Motion to adjourn

