



**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 2/3/2020

TC/TG/MTG/TRG TITLE LIQUID TO REFRIGERANT HEAT EXCHANGERS

DATE OF MEETING 2/3/2020 LOCATION ORLANDO, FL, USA

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE	
Satheesh Kulankara	7/1/2016			Pedro Perez	Omer Sarfraz
Joseph Huber	7/1/2016	Kaushik Oza	7/1/2018	Joshua Rothe	Fugiang Ren
Kashif Nawaz	7/1/2017	Stanislav Perencevic	7/1/2019	Minoo Mehdizadeh	William Asher
Adnan Ayub	7/1/2018			Nicholas Zupp	Pega Hrnjak
Evraam Gorgy	7/1/2018			Zahid Ayub	Omer Sarfraz
Achim Gotterbarm	7/1/2017			Pratik Deokar	Jim Bogart
Michael Wilson	7/1/2017			Benjamin Dingel	Icksoo Kyung
Lorenzo Cremaschi	7/1/2016			Andreas Knoepfler	Stefano Marcelli
Bryce Moore	7/1/2018			Dhruv Hoysall	Shenglan Xuan
Vikrant Aute	7/1/2019			Andrea Bigi	
				Manfred Knab	
<b>DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:</b>					
TAC Section Head: Kevin Mercer		SH8@ashrae.net			
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)					
Mike Vaughn, Manager Of Research & Technical Services		MORTS@ashrae.net			

1. Meeting called to order by chair Satheesh Kulankara. Scope of TC was read by the chair. There were 27 attendees at the meeting. The attendees introduced themselves. Chair reminded attendees of the ASHRAE Code of Ethics.
2. Establishment of Quorum
  - Members present: Satheesh Kulankara, Joseph Huber, Kashif Nawaz, Adnan Ayub, Evraam Gorgy, Achim Gotterbarm, Michael Wilson, Lorenzo Cremaschi, Vikrant Aute, Bryce Moore
  - 10 of 12 voting members were present, establishing quorum at the beginning of the meeting.
3. Review/approve minutes from previous meeting
  - Meeting minutes from summer 2020 Kansas City were reviewed.
  - Kashif Nawaz moved to approve draft minutes as circulated, seconded by Adnan Ayub. Minutes were approved unanimously (10-0-0-CNV).
4. Chairman's breakfast meeting summary (Satheesh Kulankara)
  - TC reorganization committee has been dissolved. The committee provided recommendations to TAC. TAC is evaluating the recommendations. Some committees volunteered to merge.
  - TAC has restructured TC MOP to make it easier to navigate and find information
  - RAP has sent out a survey to all ASHRAE members for feedback on research direction for ASHRAE. All TC members are encouraged to complete the survey.
  - ASHRAE has launched the 2019-2024 strategic plan with the following two broad initiative areas (details can be found on the ASHRAE website)
    - i. Built environment of the future (resilient buildings, indoor environmental quality)
    - ii. Future of ASHRAE (org streamlining, improving chapter engagement)
  - CEC is asking for continuous feedback on program tracks for Chicago conference and beyond as well as topics for specialty conferences from all ASHRAE members. Please submit your suggestions to Tony Giometti ([Giometti@ashrae.org](mailto:Giometti@ashrae.org))
  - CEC is looking to keep an updated list of volunteers to serve as chairs and reviewers of technical sessions. If you are interested, please let the chair know of your interest.
  - ASHRAE Learning Institute (ALI) is seeking ideas for new courses. Please let the chair know of topics for ALI to consider.
5. Liaison/Section Head comments (Kevin Mercer)
  - Two new MTGs were formed. One was to develop a guide for the assessment of Refrigeration and Air Conditioning Plants (MTG.RAC) and the other is for Controlled Environment Agriculture (MTG.CEA)
  - RAP has sent out a survey for all ASHRAE members asking feedback on topics of interest for research
  - All TCs have to do a self-assessment annually and decide one of three options: continue, dissolve or merge with another TC
6. Membership subcommittee report (Satheesh Kulankara)
  - 3 voting members rolling off after the Summer 2020 meeting (Satheesh Kulankara, Joseph Huber and Lorenzo Cremaschi)
  - Bryce Moore will become the chair of TC 8.5 after the summer meeting in Austin
  - Nicholas Zupp volunteered to be the secretary after the summer meeting
  - Satheesh Kulankara will be the vice-chair after summer meeting

- Minoo Mehdizadeh, Icksoo Kyung and Pedro Perez will be rolling on as voting members after the Austin meeting
- All current subcommittee chairs are continuing in their positions
- There was a call for volunteers as MTG members. Satheesh Kulankara will be the primary, with Vikrant Aute as secondary and Kashif Nawaz as alternate 2.
- There was an open call for others interested in committee membership and for provisional corresponding members who want to become corresponding members

7. Handbook subcommittee report (Adnan Ayub)

- Updated drafts of new sections were circulated prior to the meeting for review.
- TC will hold an electronic ballot after the Orlando meeting for approving the draft sections that were circulated

8. Program subcommittee report (Minoo Mehdizadeh)

- Seminar and Forum proposals for Chicago are due by July 8, 2020.
- A seminar sponsored by TC 8.5 is scheduled to be held on Wednesday, Feb 5th
- Discussion on submitting a seminar program titled “Recent developments in heat transfer/pressure drop characterization for plate HXs” for Austin (Summer 2020). Kashif Nawaz volunteered to chair the seminar and contact authors for the seminar topics. If the seminar session submission cannot be completed in time for Austin meeting, the seminar will be submitted for the Chicago (Winter 2021) meeting. Evraam Gorgy moved to approve the submission of the seminar session. Achim Gotterbarm seconded. The motion was approved 9-0-0-CNV.
- A possible seminar topic on fouling on heat exchangers was identified for the Chicago conference. TC 8.4 will be contacted to see whether there is an interest in cosponsoring this seminar

9. Standards subcommittee report (Joseph Huber)

- Updated edition of Standard 24 was published in the fall of 2019
- No actions are needed on Standards 22 and 181 at this time

10. Webmaster report (Pedro Perez)

- The website is up to date as of the winter 2020 conference

11. MTG liaison report (Satheesh Kulankara)

- Three research projects were discussed during the Kansas City meeting
  - i. RP1806 – Post-ignition simulation for A2L and A3 refrigerants. The MTG needs to discuss alternate paths for analysis.
  - ii. RP1808 – Assessment of field-made mechanical joints. Report was published
  - iii. RP1885 – Study of combustion by-products was approved after the Kansas City meeting. Project kicked off in January 2020. The project will review and summarize literature relevant to the topic.
  - iv. Work statement 1794 initiated. Investigates odorants for flammable refrigerants. Going to RAC for approval.

- There is a seminar session sponsored by the MTG at the Orlando meeting

12. Research subcommittee report (Kashif Nawaz)

- ASHRAE has started work on developing a new strategic research plan.

- Research subcommittee breakfast update: 49 active projects, 8 added this fall. Some changes to review process – previously RAC had approval authority <\$100k. Now \$150k. Was \$200k for technology council, now \$250k. 5 grants & awards added.
- (B. Dingel) RP1677 – Fouling performance of internally enhanced condenser tubes used in cooling tower applications
  - i. The project PI presented Sunday at the Research subcommittee meeting.
  - ii. Project nearing completion. 5 data sets in 9 test tubes w/ varied water quality & velocity. Generalized fouling model proposed. Draft copies received and in review. Water quality effects were stronger than tube type and velocity effects. Final report draft should be received in February 2020.
- (Z. Ayub) RP1800 – Spray evaporation on enhanced tube bundles with low-GWP refrigerants in an evaporator comprising an enhanced tube bundle
  - i. TC8.5 is cosponsoring this work with TC1.3
  - ii. The two refrigerants that will be studied are R1234ze and R1233zd
  - iii. The PI provided a status updated during the research review meeting. The construction of the experimental facility is underway. There was discussion on the details of the experimental facility. Preliminary results with R134a used as for shakedown testing with comparisons to previous research is expected to be available by the Austin meeting in Summer 2020.
- (E. Gorgy) TRP1731 – Heat Transfer Performance of Medium Pressure Lower GWP Refrigerants in a Flooded Evaporator Comprising an Enhanced Tube Bundle
  - i. RAC returned the WS with comments. Evraam will update the WS and sent to research liaison for review and approval.
- (K. Nawaz) RTAR is in progress for CO2 condensation on tubes applicable to cascade systems. K. Nawaz will circulate the document to the TC members for approval.
- TC is looking for an author for an RTAR on condensation of lower GWP refrigerants on tube bundles
- New research concepts ideas:
  - i. External condensation in tube bundle with LGWP refs, include impact of non-condensibles. R134a, R1234ze, R1233zd. Assess impact of non-condensibles at concentrations above, at, & below AHRI allowable limits (RTAR in progress). Possible modeling component as follow-up project?
  - ii. Heat transfer measurements & correlation development for tube-in-tube fluted/coaxial tube HXs. Split into two RTARs for evaporation & condensation. Look for TCs to co-sponsor (geothermal, HP water heat, etc) (V. Aute, M. Wilson)

### 13. New business

- TC MOP requires each TC to evaluate the purpose and scope of the TC and vote on whether to continue, dissolve or merge with another TC annually.
- Chair proposed a motion that TC 8.5 continue without changes to structure. Seconded by Achim Gotterbarm. Motion was approved 9-0-0-CV.

### 14. Schedule next meeting (S. Kulankara)

- Monday, 6/29/20, 4:15-6:30 PM in Austin, TX

### 15. The committee voted unanimously to adjourn the meeting