



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

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### 1. Call to Order (Nawaz)

Chair Kashif Nawaz called the meeting to order at 1:02 Pacific time.

TC 1.3 is concerned with the fundamental principles of the transport of energy, mass, and momentum, especially the study of and application to, physical processes in air conditioning, refrigeration, heating and related areas of environmental engineering.

### 2. Introduction of members and guests (Nawaz)

Attendees introduced themselves in the conference room and on Zoom.

### 3. Establish quorum requirements (Nawaz)

Seven members out of 12 were present at the start of the meeting. A total of nine voting members attended all or a portion of the meeting.

### 4. ASHRAE Code of Ethics Commitment (Nawaz)

Chair Kashif Nawaz read 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>.)

### 5. Review of Agenda (Nawaz)

Chair Nawaz reviewed the agenda.

### 6. Review/Approve minutes from 2021 Annual meeting (Wilson/Derby)

Members reviewed the minutes from the June 2021 virtual TC 1.3 meeting. Huber issued a motion to approve, seconded by Elbel. The vote was 6-yes, 5 absent, 1 abstention.

### 7. Section Head Comments (Meredith)

Kashif Nawaz gave a brief update from chair’s breakfast and highlighted ASHRAE’s interest in decarbonization and its Vision 2030. Dave Meredith gave a TAC update. He encouraged balance on each committee, and mentioned including only one voting member from each company/university/etc. Dave Meredith encouraged leadership to keep track of potential committee members and leaders.

### 8. Liaison Comments

Sonya Pouncy, handbook liaison, attended the meeting. She is available as a resource for the TC 1.3 Handbook committee.

## 9. Membership Subcommittee (Gotterbarm/Nawaz)

Due to the time difference, Achim Gotterbarm sent notes on membership, which Chair Nawaz delivered. Joe Huber, Stefan Elbel, Brian Fronk, Andreas Knoepfler and Stanislav Perencevic are rolling off TC 1.3 after June 2022's meeting. Michael Wilson, Melanie Derby, Achim Gotterbarm, Guru Ravi and Vikrant Aute agreed to roll on. The current TC 1.3 balance is 7 academics and 5 industry members, and the balance will remain with the new members.

Chair Nawaz discussed converting members from provisional corresponding members to corresponding members.

## 10. Handbook Subcommittee (Ravi)

TC 1.3 is responsible for chapters 3, 4, 5, 6, 33 of the Fundamentals Handbook. The handbook subcommittee met in October of last year and last month to discuss the next revision of the handbook. Dr. Shah shared a list of topics that could be explored for chapters 5 and 6.

It has been decided to use ASHRAE authoring portal to edit chapters as the portal allows for collaborative editing. We also confirmed that this method works when multiple people are working on it simultaneously. Got a note from the ASHRAE handbook editor that the latest revision of the handbook is not yet available in the authoring portal. Guru will inform everyone once its available. Guru created a working folder in portal with a copy of the old revision of chapters.

## 11. Program Subcommittee (Pratik Deokar)

Due to Covid-19, only one speaker was able to attend the AHR Expo session sponsored by TC 1.3 focused on low GWP refrigerant under flow condensation. As a result, ASHRAE transferred Joshua Roth to an AHR Expo session 1 (TC 1.3 a co-sponsor). Thanks to Pratik for getting the seminar acknowledged.

Pratik suggested TC 1.3 resubmit the seminar with the same speakers at the Annual Conference, with the possibility of adding an additional presentation from ORNL. He will reach out to speakers.

TC 6.9 Thermal storage, asked TC 1.3 to consider co-sponsoring a seminar with Dr. Simone Mancin on thermal storage. Thermal storage is a topic of interest to TC 1.3, but the committee suggested additional speakers be added. Pratik will reach out to TC 6.9. Thermal storage.

## 12. Status of other current/proposed programs (Fronk)

Dr. Fronk is chairing research summit for the 2022 Annual Meeting in Toronto. He encouraged the committee to submit extended abstracts for the research summit. Abstracts use the conference page format and have a 3 page maximum. Abstracts will be grouped into sessions and he will engage with potential TC 1.3 sponsorship.

Program ideas for future conferences including co-sponsoring or sponsoring other low GWP programs in components and systems.

### 13. Webmaster (Deokar)

Deokar does not currently show as a webmaster. Chair Nawaz will connect Deokar with the track liaison.

### 14. MTG Liaison: Low GWP Refrigerants (Omar Abdelaziz -Liaison, Satheesh Kulankara – Alt#1, Evraam Gorgy– Alt#2)

None of the alternates were able to attend. Ray Rite, TC 1.1 liaison for this MTG, was able to give a report. The MTG has three meetings at the Las Vegas meeting. There is a report out on the research projects wrapping up, RP 1806 post ignition simulation and risk assessment update. It is a large computational project and verification testing. The project is still ongoing and the initial report may be released in the spring. Several other projects have recently wrapped up. Originally, the MTG was supposed to be about life cycle costing with low GWP refrigerants; there is potentially more interest in LCCP projects.

### 15. Research (Huber)

#### a. Updates from the Society research meeting

Joe Huber shared slides from the research subcommittee research breakfast from RAC. The current research budget only covers contract commitments. NIA, GIA and IRG programs have been suspended, but may potentially restart in the society year 2022-2023. URP unsolicited research projects stopped for the time being.

The Research Promotion campaign was successful. There are 17 TRPs in the queue, ready to bid for SY 22-23. A new ASHRAE strategic research plan was approved in Dec 2021, and is currently available on ASHRAE research page. There are six areas of emphasis, and the TCs should use the research plan while developing research projects. There are also training modules for Project Monitoring Subcommittee and Proposal Evaluation Subcommittee. PMS meetings are open to the public. ASHRAE is developing a web-based tool for submitting and tracking Research project documents.

#### b. 1683-WS: “Experimental Evaluation of 2-Phase Pressure Drop and Flow Pattern in U-Bends with Ammonia”

There was a hybrid format for the TC 1.3 Research Meeting. The PI is Dr. Ahmad Abbas and PMS Chair is Ray Rite. PMS approved the test facility and test plan. Low temperature is a concern. The facility has been constructed, and shakedown testing planned in March. The researchers satisfactorily addressed PMS concerns. Following shakedown testing, the team will acquire results, hopefully to be presented at the next TC 1.3 Research Meeting.

#### c. RP-1800: “Spray Evap. on Enhanced Tube bundles with low GWP Pure ref. and ref./miscible oil mixtures”

The PI is Dr. Lorenzo Cremaschi. The research team presented some data at AHR expo session. Oil testing has started and the team presented data at the TC 1.3 meeting. The PMS is in discussion with the research team. A new diaphragm pump was installed which resolved pumping problems.

The PMS recommended no cost extension. Motion to grant a 1-year no cost extension (Huber/Rite). The vote was 7 yes, 4 absent, 1 abstention.

d. Co-sponsorship opportunities

There is the potential to co-sponsor TC 8.08 RTAR Capillary tube and short tube orifice performance for low GWP refrigerants. Motion for co-sponsorship (Huber/Nawaz). The vote was 8 yes, 4 absent. The TC suggested TC 1.3 include a representative for PMS/PES, Ray Rite.

e. Pending research topics and future research plans

RTAR 1909 conditionally accepted, and plan to bring it to TC 1.3 for the summer meeting. Vikrant Aute is working on a fluted-tube heat exchanger research project with TC 8.5, and potential for TC 1.3 to co-sponsor. The plan is for an e-ballot vote.

16. Chair Comments (Nawaz)

Chair Nawaz shared information from the chair's breakfast. He thanked TC members and subcommittee chairs for briefing.

17. New Business

No new business.

18. Next meeting: TBD (Nawaz)

Nawaz is hopeful the next meeting is in person in Toronto on Tuesday afternoon.

19. Adjourn

Adjourned the meeting at 2:50 PM eastern. Motion to adjourn (Huber/Rite). The motion passed.