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# 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. 1.3 DATE 06-26-2018

TC/TG/MTG/TRG TITLE Heat Transfer and Fluid Flow

DATE OF MEETING 26 June 2018 LOCATION Houston, TX

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| MEMBERS PRESENT | YEAR APPTD | MEMBERS ABSENT | | YEAR APPTD | EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE | |
| Ray Rite | 2014 | Liping Liu | | 2014 | Lindsey King | |
| Melanie Derby | 2017 |  | |  | SA Sherif | |
| Vikrant Aute | 2017 |  | |  | Ben Dingel | |
| Achim Gotterbarm (NQ) | 2014 |  | |  | Amir Jokar | |
| Satheesh Kulankara | 2017 |  | |  | Joe Huber | |
| Kashif Nawaz | 2016 |  | |  | Evram Gorgy | |
| Zahid Ayub | 2016 |  | |  | Omar Abdelaziz | |
| Man-Hoe Kim | 2015 |  | |  | Kevin Dunshee | |
| Lorenzo Cremaschi | 2014 |  | |  | Ahmed Elatar | |
| Vishaldeep Sharma | 2016 |  | |  | Stefan Elbel | |
| Mike Wilson | 2017 |  | |  | Jie Li | |
|  |  |  | |  | Ebrahim S Al-Hajri | |
|  |  |  | |  | Akshay Bhargava | |
|  |  |  | |  | Brian Fronk | |
|  |  |  | |  | Andreas Knoepfler | |
|  |  |  | |  | Icksoo Kyung | |
|  |  |  | |  | Kishan Padakannaya | |
|  |  |  | |  | Sankar Padhmanabhan | |
|  |  |  | |  | Stanislav Perencevic | |
|  |  |  | |  | Alex Friellyand | |
|  |  |  | |  | Marium Lanewala | |
|  |  |  | |  | Chad Bowers | |
|  |  |  | |  | Michel Hayek | |
|  |  |  | |  | Prince Preet Saini | |
|  |  |  | |  | Shreenithi Lakshmi NArsimhan | |
| **DISTRIBUTION: *All Members of TC/TG/MTG/TRG plus the following:*** | | | | | | |
| TAC Section Head: Amir Jokar | | | | SH1@ashrae.net | | |
| 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 | | |

**DRAFT MINUTES: ASHRAE TC 1.3 – Heat Transfer and Fluid Flow**

**Annual Meeting, 26 June 2018**

**Call to Order and Reading of TC 1.3 Scope** (Ray Rite)

Chair Ray Rite called the meeting to order at 1:03 pm. The title, purpose and scope of the TC were read.

**Introduction of members and guests** (Ray Rite)

Introductions around the room followed. Inquired about PCM.

**ASHRAE code of ethics** (Ray Rite)

**Establishment of Quorum** (Ray Rite)

* 10 of 12 voting members (quorum) were present along-with 1 non-quorum member, so a quorum was established. Agenda was modified. Research was moved to before membership.

**Review/Approve Minutes from Long Beach, Jan 2018** (Rite)

Motion:Approve minutes as submitted. *(Vikrant/Man-Hoe)* 9-0-1-2-CNV

**Section Head Comments** (Amir Jokar)

Section head reported regarding the significant improvements in the TAC processes and procedures. TAC is getting involved in program evaluation to ensure better communication. TC chair updated section head regarding the quorum, roster update, website.

**Program Subcommittee** (Melanie Derby)

* TC 1.3 co-sponsored a seminar on “novel measurement techniques”, the session was well-attended. Approximately 65 attendees participated.
* CEC is considering the extended abstract format for publications since it is less work on researcher, compared to conference paper.
* There was a discussion on the research summit schedule and was noted that it should be on one day for easy accommodation.
* There was a discussion on the potential track on fundamentals to covers topics such as condensation, fouling and frosting.

**Honors and Award** (Ray Rite): Nothing to report.

**Handbook Subcommittee** (Rick Couvillion/ Kashif Nawaz)

* Ray Rite provided the update on behalf of Rick Couvillion. All the Chapters managed by TC 1.3 (Fundamentals: Chapter 3, 4, 5 and 6) have been revised and submitted for 2017 Fundamental Handbook.
* Kashif Nawaz updated for Chapter 5 revision plan. Vikrant Aute, Man-Hoe Kim, Stefan Elbel, will assist in revision process. Volunteers are requested to join the effort.
* All TC members have access to the chapters through authoring portal and are encouraged to participate in the revision process.
* There is a new chapter initiative on Heat Recovery Applications. TC was asked for potential interest. TC was asked to provide a section with example calculations. TC commented that since fundamentals are different which is the major theme of chapters managed by TC 1.3 a paragraph should be sufficient referring key points and referring to appropriate chapters.
* Kashif Nawaz will continue to manage Chapter 5.

**Membership Subcommittee** (Achim Gotterbarm)

VMs rolling off: Ray Rite, Liping Liu, Lorenzo Cremaschi, Achim Gotterbarm (NQ), Raymond Rite,

* New voting members: Joe Huber, Evraam Gorgy, Andreas Knoepfler(NQ), Stanislav Perencevic(NQ), Stefan Elbel, Brian Fronk, Michael Ohadi
* The voting member count, 8 from industry and 6 from academia. There are 16 provisional members. The number of corresponding members is 59.
* All sub-committee chairs (handbook, web, programs, research, standards, MTG liaison) decided to stay on.
* Marium Lanewala volunteered to be the webmaster. Ray and Lindsey will assist with the transition of role.
* Mike Wilson has been appointed as the secretary starting July 01, 2018.

**Webmaster/Journal/Insights Reports** (Lindsey King)

Website is up-to-date; agenda will be posted online. TC chair thanked the webmaster for support.

Marium Lanewala will assume the role of webmaster.

**Research Subcommittee** (Joe Huber)

* Notes from sub-committee chairs’ breakfast.
* RAC has conditionally approved 3 work statements since the Chicago meeting.
* RAC has considered 3 RTARS since Chicago meeting with one accepted, one conditionally accepted and one rejected
* ASHRAE has about 25 awards related to research for students. The deadline for nomination is Mar 1. The student’s advisor/school has to nominate.
* Nominations for service to ASHRAE research award are due by Sep 30
* ASHRAE plans to conduce online training sessions for PES and PMS members. All PES and PMS members are encouraged to attend these sessions
* The deadline for RTARs and WS to be considered by the Atlanta meeting is December 3rd.

***TC 1.3 Research Status:***

* 1556-RP “Characterization of Liquid Refrigerant Flow Emerging from a Flooded Evaporator Tube Bundle” has been completed and the report has been approved by TC. PMS chair thanks and congratulated team, Dr. Eckels, the PI for the project. Voting details: Email ballot returned Dec 22nd, 2017 (9-0-0-3-CNV).
* Brian Fronk presented on the research project “Condensation of zeotropic mixture in microchannel with A2L” during the research sub-committee meeting.
* Eckel updated on TRP 1863. PES met to evaluate the work statement, asking for more specific information to be provided. It was decided that a better matrix should be incorporated, discussion on oil concentration and visualization. It was decided that WS will be modified to address concerns and will be sent back to RAC. no vote will be required, Liaison will be changing to Steve Kujak from Prof. Kato. Ray thanked Steve Eckel for help.
* TRP-1800- 7 proposals went on which were evaluated by PES. During the meeting an executive session was called. PES chair provided the details, 7 contractors participated and individual evaluation was carried out for all proposal. Based on the feedback TC selected the vendor and voted on 10-0-0-2- CNV.

***New RTAR ideas:***

* Multiple new ideas were mentioned including
* Shell and tube heat exchangers.
* In-tube and shell side condensation process
* air to refrigerant heat exchangers.
* Frost on air-side

Bio-inspired heat exchangers: TC discussed about the topic of the project. Kashif volunteered to lead the RTAR. Vikrant and Ebrahim Elhajri to assist.

Joe Huber will follow up with Xiaofie Wang regarding RTAR 1737: “Study of the Effects of Modifying the Wetting Surface of Evap Condensers in Ref. Systems for Performance Improvement”.

**Low GWP Refrigerants MTG Liaison** (Satheesh Kolankara)

Project 1: RP-1806 “Flammable Refrigerants Post-Ignition Simulation and Risk Assessment Update”- GexCon US has been leading the project. CFD modeling of refrigerant leaks and risk assessment. The project is in progress. The team is looking for data to validate the CFD models.

Project 2: RP-1807 “Guidelines for Flammable Refrigerant Handling, Transporting, Storing and Equipment Servicing, Installation and Dismantling”- Navigant is leading the project. Safe handling of flammable refrigerants. Literature survey for best practices. Final report is out. May have a vote Wednesday.

Project 3: RP-1808 “Servicing and Installing Equipment using Flammable Refrigerants: Assessment of Field- made Mechanical Joints Systems”- CTS (Creative Thermal Solutions) has been leading the project. Testing of field joints to see which joint is the most robust. Field made mechanical joints. Project just completed – PMS has final report and will vote in next few months.

AHRI proposed a new project on Leak detector and toxic by-products. It was discussed during MTG meeting on Sunday, voted on MTG and approved for support. Co-sponsorship is mandatory.

**Chair Comments** (Ray Rite)

Chair’s Breakfast Notes:

Chair attended breakfast Sunday Morning 6:30 AM. Attached here are the Section Head, Program Committee, and Publications handouts from that meeting.



**New Business:**

NIST and RefProp- the whole situation has been resolved. RefProp has been saved. Favorable outcome.

**Schedule Next Meeting** (Ray Rite)

Tuesday, 15 Jan Atlanta, GA at 1:00 PM -3:30 PM.

**Adjournment** (Ray Rite)

Ray adjourned the meeting 2:35 pm.

**Minutes Recording** (Kashif Nawaz)

Meeting minute shared for distribution on 25 March 2018.