

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS,
INC.**

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

TC/TG/TRG MINUTES COVER SHEET

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

TC/TG/TRG NO TC 8.5 DATE 4 January 2013

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

DATE OF MEETING 25 June 2012 LOCATION San Antonio, TX

| MEMBERS PRESENT | YEAR APPTD | MEMBERS ABSENT | YEAR APPTD | EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE |
|--------------------|------------|------------------|------------|--|
| Zahid Ayub | 2008 | Ebrahim Al-Hajri | 2011 | Adnan Ayub |
| Lorenzo Cremaschi | 2011 | Omar Abdelaziz | 2010 | Bill Fox |
| Ben Dingel | 2010 | Jim Bogart (NQ) | 2010 | Evraam Gorgy |
| Steve Eckels | 2010 | John Thome | 2010 | Achim Gotterbarm |
| Joe Huber | 2009 | | | Justin Kauffman |
| Amir Jokar | 2010 | | | Liping Liu |
| Andreas Knoepfler | 2008 | | | Jeff Martin |
| Satheesh Kulankara | 2008 | | | Sankar Padhmanabhan |
| Petur Thors | 2009 | | | Stanislav Perencevic |
| Samuel Yana-Motta | 2011 | | | Kent Perkins |
| | | | | Justin Piggush |
| | | | | Eugene van Rooyen |
| | | | | James Schaefer |
| | | | | Ken Schultz |
| | | | | Michael Taras |

DISTRIBUTION

| <i>All Members of TC/TG/TRG plus the following:</i> | |
|--|--|
| TAC Section Head: | Stephen Duda |
| TAC Chair: | William McQuade |
| All Committee Liaisons As Shown On TC/TG/TRG Rosters: | Donald Brandt, Patrick Marks, David Yashar, Francis Mills, Rick Larson |
| Manager Of Standards Manager Of Research & Technical Services | Mike Vaughn |



ASHRAE

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Inc.

1791 Tullie Circle, NE • Atlanta, Georgia 30329-2305 ☎ 404-636-8400 • Fax 404-321-5478

ASHRAE TC 8.5 – Liquid-to-Refrigerant Heat Exchangers Annual Meeting, 25 June 2012 (San Antonio, TX)

Call to Order (B. Dingel)

Ben called the order at 4:25 and read the TC 8.5 TPS.

Confirmation of Quorum

10 of 13/14 (1 Non-quorum absent) voting members were present, so the quorum was established.

Members present: Ayub, Cremaschi, Dingel, Eckels, Huber, Jokar, Knoepfler, Kulankara, Thors, Yana-Motta

Members absent: Al-Hajri, Abdelaziz, Bogart (NQ), Thome

Section Head Comments (S. Duda)

Duda expressed appreciation to Ben Dingel for his service as chair, and to Joe Huber for the status of the website. He also commented on speaker scoring, noting that approximately 10% of speakers in Chicago did not meet the target score of 3.5+. To offset concerns about the speaker evaluation forms being a poor tool for rating speakers, CEC will have someone attend presentations by speakers receiving low scores to provide an additional level of review. Nominations for the Hightower award are due 1 September 2012, and there were not many nominations last year.

Approval of the Minutes from the previous meeting in Chicago, IL

Minutes were circulated for review. Dingel moved to approve the minutes as submitted. Eckels seconded the motion. The motion passed by a vote of ten for, none opposed, none abstained (10-0-0).

Chair Comments (B. Dingel)

The new roster is in effect 1 July 2012. Members may see the roster by clicking Membership on the ASHRAE website and then clicking 'My Membership', then 'Biographical Records System' and then 'Committees'. TC/TRG/MTG information is available on the TC ASHRAE site along with the Manual of Procedures (MOP). Distinguished Service, Exceptional Service and other award nominations are due 30 September 2012. Dingel also mentioned that thank-you letters are available. Volunteers were solicited to be technical program reviewers or session chairs and Padhmanabhan and Liu added their names to the list that already included Al-Hajri, Bendapudi, Kauffman and Schultz. Subcommittee meetings may take advantage of conference calls or webmeetings through ASHRAE and one may contact Mike Vaughn with questions.

Report from Handbook Sub-Committee Chair (B. Dingel for J. Bogart)

The systems and Equipment handbook just published in 2012 and we re-publish in 2016. Intermediate updates should include results of ASHRAE research, and the PMS should provide input to handbook subcommittee chair for each research project.

Report from Program Sub-Committee Chair (B. Dingel for O. Abdelaziz)

There will be a speaker registration fee of \$95 (\$25 for students) beginning in Dallas. To improve odds of program selection it was noted that submissions should have a strong abstract and submitters should talk directly with the appropriate track chair before submission. Additionally, programs should focus on research. CEC is looking for suggestions for track topics for future conferences, with sessions to go along with the track.

For San Antonio the number of programs submitted and accepted were:

Technical Paper: 31/43
Conference Paper: 43/86
Seminar: 67/120
Forum: 8/17

Abdelaziz was planning a program in Dallas regarding recent advances in heat transfer with Thome, Jokar, and Khan to present. Kauffman will confirm progress with Omar.

Another program on oil effects in heat exchangers was mentioned for Denver with presentations from EPFL, Illinois and OK State.

Report from Membership Sub-Committee Chair (B. Dingel reporting for K. Oza)

The new roster takes effect 1 July 2012.

Rolling off: Ayub, Bogart, Huber, Knoepfler, Kulankara

Rolling on: Bendapudi, Kauffman, Oza, Perencevic (NQ), Schaefer

Voting members as of 1 July 2013 (13 with 1 NQ): Abdelaziz, Al-Hajri, Bendapudi, Cremaschi, Dingel, Eckels, Jokar, Kauffman, Oza, Perencevic (NQ), Schaeffer, Thors, Yana-Motta

The committee has 28 corresponding members and will have 34 as of 1 July 2012.

Report from Standards Sub-Committee Chair (J. Huber)

Standard 22: "Methods of Testing for Rating Water-Cooled Refrigerant Condensers" is under revision. A publication review is expected by the end of 2012 after inclusion of uncertainty analysis. Note that the standard does not include trans-critical or super-critical analysis.

Standard 181: "Methods of Testing for Rating Liquid to Liquid Heat Exchangers" is also in draft form, but is not as far along as Standard 22. Lessons learned from Standard 22 will be applied to 181 and a publication draft is expected in 2013.

Standard 24: "Methods of Testing for Rating Liquid Coolers" received a vote to reaffirm due to lack of resources to open a third standard for revision.

Report from Webmaster (J. Huber)

No updates from Joe. Ben thanked Joe for keeping the website up-to-date.

Report from Research Sub-Committee Chair (K. Schultz)

Nineteen new projects have been awarded, twenty-eight have completed, and sixty-two remain active, with eleven active projects in the closing phase. RAC conditionally approved six TRPs including WS-1677 (Fouling in enhanced tubes). Five submissions were received for the ASHRAE Innovative

Research Grants, and all were declined because they were not innovative enough or were product development focused. RAC is revising the scope to be more specific.

The research manual is being updated to improve the RTAR form and will include new text about URPs. RTARs are to include justification for cost and duration, and the research liaison should be involved in the RTAR and WS development process.

RP-1345: Waterside Fouling Performance of Brazed-Plate Type Condensers in Cooling Tower Applications

PMS recommended to approve RP-1345 after Chicago via e-ballot in January. The motion passed by vote of thirteen for, none opposed, and one abstained (13-0-1), and the disposition form was submitted to MORTS. This project is closed.

WS-1677: Measurement and Prediction of Waterside Fouling Performance of Internally Enhanced Condenser Tubes used in Cooling Tower Applications.

The work statement was submitted to RAC 12 May 2012 and was conditionally approved. TC 8.2 has identified Paul Kozlov to aid on PMS. It would also be beneficial to have members from TCs 3.6 and 8.6 on the PMS. The PES currently includes Dingel, Bendapudi, Knoepfler, Kulankara and Schaefer. Ben moved to title WS-1677 "Measurement and Prediction of Waterside Fouling Performance of Internally Enhanced Condenser Tubes". Knoepfler seconded the motion. The motion passed by a vote of ten for, none opposed, none abstained (10-0-0).

RTAR regarding waterside fouling performance of coiled tubes. Bogart started the RTAR and Schultz will now take the lead. There were questions about the importance of this work. The RTAR would likely require refinement for justification. The next submission deadline is 15 August 2012.

Topics discussed for future research include:

- Propane in brazed plates
- CO₂ gas coolers
- Heat transfer performance of low GWP refrigerants
 - Kauffman to begin RTAR on pool boiling of pure HFO-1234yf and HFO-1234ze with enhanced tubes in a tube bundle, with assistance from Yana-Motta and Gorgy. Note that there are recent publications from Thome on HFO-1234ze, but they are for single tubes. Dingel will provide prior bundle boiling RTARs and WSs.
- Shah suggested boiling and condensation generalization in brazed plates, but it was determined that this is better suited to TC 1.3.

New Business

- Lower GWP MTG notes should be listed as a separate item on the agenda.
- AHRI Guideline E regarding fouling factors is being updated. A committee has been formed and they are looking for volunteers for crafting text in the guideline. It was last updated 15 years ago. Dingel and Cremaschi will be involved.

Adjourn.

Dingel motioned to adjourn. Ayub seconded. The motion passed by ten for, none opposed, none abstained.