

## TC 08.05 RESEARCH REPORT – JUN 2013 / DENVER

The joint TC 1.3/8.5 Research Review Meeting was held Sun 23-Jun-2013, 3:00pm-4:00pm. The status of TC 1.3's one active project, 1556-RP – Characterization of Liquid Refrigerant Flow Emerging From a Flooded Evaporator Tube Bundle, was presented by the PI, Steve Eckels of Kansas State University.

Following the 1556-RP update, the status of 1677-TRP was given (see below) and a list of proposed research topics was displayed as a reminder (see attachment).

### **1677-TRP – Measurement and Prediction of Waterside Fouling of Internally Enhanced Condenser Tubes in Cooling Tower Applications** (WS author and PES chair: Ben Dingel)

The PES was unable to make a recommendation for contractor to the full committee in Dallas (Jan13), having questions about one of the proposals. Those questions were delivered to the respective bidder ~05-Feb. Responses by the bidder to the PES questions were received ~20-Feb. The PES completed their evaluation ~04-Mar. A teleconference was held 14-Mar with TC 8.5 voting members to present the recommendation. The TC vote was 7 For / 0 Against / 1 Abstain (bidder) / 5 Absent (13 total) to approve the PES's recommendation. This information was then forwarded to MORTS 18-Mar by the PES chair and put on the agenda for the RAC Spring meeting.

The Research Report from the Spring meeting indicated that "[t]he funding recommendation for this project carries over to the RAC meeting in Denver due to insufficient time to discuss during RAC spring meeting." (Our liaison was unable to attend the Spring meeting due to a family emergency.) The liaison reported at the Mon morning Research Breakfast that 1677-RP will very likely be approved at the Denver RAC meeting.

### **Notes from discussion of topics for research during the TC 8.5 main meeting**

Discussion about potential research topics was quite energetic. The main theme was characterization of the heat transfer performance of lower GWP refrigerants in a variety of liquid-to-refrigerant applications. A summary of the topics follows:

- *Experimental evaluation of the heat transfer performance of alternative lower GWP refrigerants in a highly enhanced horizontal tube bundle.*  
Justin Kauffman has begun to draft an RTAR on this topic. After a bit more work, the draft will be circulated for discussion. It is hoped that this RTAR could be approved by the TC and submitted to RAC by 15-Aug for consideration during the Fall RAC meeting.
- *Heat transfer performance of lower GWP refrigerants in a sprayed evaporator bundle.*  
Zahid Ayub volunteered to begin drafting a work statement (bypassing an RTAR), targeting submission by 15-Aug.
- *Heat transfer performance of lower GWP refrigerants in a condenser tube bundle.*  
This topic was raised by Steve Eckels. Satheesh Kulankara and Andreas Knoepfler volunteered to assist.
- *Heat transfer performance of lower GWP refrigerants in plate-type evaporators.*  
This topic was raised by Zahid Ayub. Previous work statements can be used as a starting point.

- *Heat transfer performance of lower GWP refrigerants during in-tube flow boiling.*  
This topic was raised by Joe Huber. Zahid volunteered to assist, along with a request to John Thome. It was decided to allow TC 1.3 to take the lead on this project.

The previous list of topics for research still remains. However, the high interest in the above project ideas suggests the previous list has lower priority. A couple of notes:

*Evaluation of Tube Cleaning Processes and Techniques*

Such a project might follow 1677-RP and serve as a lead-in for developing a method of test for comparing and rating (by another organization) tube cleaning techniques.

*Impact of Oil on Flooded Coolers*

TC 8.2 is expecting to submit an RTAR by 15-Aug. The gist is to perform a field survey of oil levels/concentrations in evaporators of scroll, screw, and centrifugal chillers.

### **Notes from the Research Breakfast**

The slides from the Research Breakfast are attached at back. The main points of interest follow:

- There are currently 58 active research projects with values of \$11M+. Since Jul12, 14 projects completed and 11 new projects started. 14 TRPs released for bid; no TRP's in the queue.
- Only 5 RTARs and 2 WSs received for review in Denver. There is a need for more RTARs and WSs!
- Improvements to the Instructions for PESs have been drafted to make the responsibilities and actions of the PES more clear. In particular, the section research liaison shall be present during PES evaluation sessions. Also, scores on evaluation forms can be changed following discussion within the PES.
- The RTAR form has been updated (again). It is now a fillable-from PDF. The layout attempts to promote brevity and clarity. The form (along with a filled-out example) should be available on the Research website shortly after the Denver meeting.

## TC 8.5 Research

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- ▶ **1677 – Measurement and Prediction of Waterside Fouling Performance of Internally Enhanced Condenser Tubes Used in Cooling Tower Applications**
  - PES has recommended a contractor to RAC (Mar).
  - RAC did not get this project during its Spring Meeting; will review at the Denver Meeting.
  
- ▶ **Other ideas proposed:**
  - **The Behavior of Lower GWP Refrigerants in Shell-and-Tube Heat Exchangers**
    - waiting for draft RTAR (Kauffman, Schultz, Gorgy, Yana Motta)
  - **Evaluation of Tube Cleaning Processes and Techniques**
    - ???; co-sponsorship by TC 8.2 and TC 3.6?
  - **Water-side Fouling of Coiled-Tube Type Condensers**
    - RTAR drafted by Jim Bogart/Jun11. Needs dust-off and update. (Schultz, Knöpfler)
  - **Generalized Heat Transfer Correlations for BPHE's**
  - **Use of Propane and CO2 in BPHE's**
  - **Impact of Oil in Flooded Coolers**
    - RTAR being prepared by TC 8.2; participate if needs revision, help with PES/PMS?



## Research Subcommittee Chairs' Breakfast Presentation

Summer Meeting 2013 – Denver, CO  
Agami Peddy, Vice Chair

Monday, June 24, 2013



Research Administration Committee



## Agenda

- ASHRAE Service to Research Award
  - Current Projects
  - WS and RTAR Status and Revisions
  - Innovative Research Grant (IRG) Proposals
  - Announcements
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- Garimella: Revision to RTAR Document
  - Bivens: PES Evaluation Procedures and Guidelines



Research Administration Committee



## ASHRAE Service to Research Award

- Purpose
  - recognize individual for excellence in volunteer service related to Society research
- Eligibility
  - ASHRAE members who have demonstrated exceptional research service (planning, proposal evaluation, project monitoring and/or utilization of project results)
  - Not open to current TC chairs or RAC/TAC members
- Nomination by TC/TG chair of a voting or corresponding member by September 30



## Current Projects

- We have **58** active RPs
  - **Total value > \$ 11 million**
- Since July 2012:
- **14** projects were completed.
  - **11** new projects were started
  - **14** Tentative Research Project (TRPs) released for bid – No projects were on-hold this year waiting to bid due to a shortage of funding



Research Administration Committee



## WS and RTAR Status

- In Denver, RAC evaluated 5 RTARs (1702, 1703, 1704, 1706, 1707) and conditionally accepted (2) / returned (2) / rejected (1)
- RAC also evaluated 2 WSs (1587, 1705) and conditionally accepted (1) / returned (1)
- TRPs potentially ready for bid in fall 2013- 7
- TRPs ready for bid in fall 2013 so far - 0

Research Administration Committee



## Innovative Research Grant

- Seed funding for novel research (up \$125k)
  - ideas must have potential to significantly advance the state-of-the-art in HVAC engineering
  - intended to encourage out-of-the-box research
  - \$50k per year for two years, additional \$25k possible with industrial matching
  - May award "0-1" each year (very competitive)
- Proposal Process
  - Pre-Proposal (2-page white paper)
  - Reviewed by RPS/RAC (and invited experts) –winter meet
  - Invited full proposals reviewed by RAS/RAC at Spring meet

## ASHRAE INNOVATIVE RESEARCH GRANTS

- Last year was the first time that proposals were solicited for IRGs - we received 18 pre-proposals, 5 invited full proposals, and none were awarded
- Language, guidelines and timeline were modified for the 2<sup>nd</sup> round
- Received 18 pre-proposals, 3 invited for full proposals
- RAC discussed them and made a recommendation to Tech. Council

## ASHRAE TC's are encouraged to generate more research

- The number of RTARS (5) and WS (2) for RAC to evaluate was quite low which may cause a shortage of promising research projects in the near future!
- It takes between 1-2 years before a research topic is approved and ready for bid.
- If we don't receive more project ideas during 2013/14 Society year, we may run out of projects to bid.

## ASHRAE Denver Seminars

- Seminar 30: 11:00 – 12:30 Tuesday June 25  
"Are We There Yet? Review of the 2010-2018 Research Strategic Program"
- Seminar 33: 1:30 – 3:00 Tuesday June 25  
"How Can I participate in the ASHRAE Research Program?"

## ASHRAE Use Your Liaison

- Your Liaison should read your RTARs and WSs before you submit them.
  - But give him more than a couple days before the deadline
- Your Liaison has the Answers and can help you interpret RAC comments and Manual
- Your Liaison is your champion!
  - He can advocate for you, if he is involved

## ASHRAE Your Research Liaisons are ready to help you

- |  |  |
|--|--|
| • 1- Arthur Giesler                      | • 6- Stephen Hancock                   |
| • 2- David John<br>(Harvey Sachs)        | • 7- Phil Haves                        |
| • 3- Mark Spatz                          | • 8- David Yashar                      |
| • 4- Srinivas Garimella<br>(Xudong Yang) | • 9- Kishore Khankari                  |
| • 5- Piotr A Domanski                    | • 10- Pradeep Bansal<br>(John Shonder) |

Establish "Liaison" with Research Liaisons



## INSTRUCTIONS FOR PES

### ASHRAE RESEARCH MANUAL

#### Section 6: Solicited Proposals

- 6.1 Evaluation of Solicited Proposals  
(evaluation criteria/approval flow)
- 6.2 Instructions for Proposal Evaluation Subcommittee  
(purpose/scope/members/evaluation and selection of contractor)



## Evaluation/Contractor Selection *(draft additions)*

The PES will be responsible for evaluating proposals and for recommending to the TC the contractor to perform the research. The Research Liaison (or a designated substitute RAC member) will be present during the PES evaluation meetings to assist with evaluation procedures.

#### Before the PES meets:

Each PES member individually reviews and scores all proposals received for the project. They score each proposal using the proposal evaluation criteria published in the Request for Proposal, which was posted on the ASHRAE website to solicit the proposals.



## Evaluation/Contractor Selection *(draft additions)*

The PES will then meet to discuss the proposals, either in person or by a conference call with prior approval by the Research Liaison.

#### During the PES meeting:

- Each PES member shall discuss their opinion of the merits and weaknesses of each proposal with the other PES members. They can also reveal the initial scores they gave each proposal individually per the evaluation criteria.
- After the discussion has been completed, the PES members shall complete or revise individually their Proposal Evaluation Form (PEF) scores based on their personal preference.



## Evaluation/Contractor Selection *(draft additions)*

- The PES Chair uses the completed PEFs from all PES members to calculate average scores for each proposal and fills out the Summary Sheet for Reporting Evaluation of Proposals.
- As the final step, the PES selects and votes on a bidder to be recommended to the TC. It can be the lowest cost responsive bidder or a higher cost bidder based on the criteria presented in Section 6.1. if a higher cost proposal is recommended, the PES must also provide an explanation on the Summary Sheet to justify this recommendation.
- The Summary Sheet and copies of all PEFs and supporting documentation must be provided to the sponsoring committee for submittal to MORTS.....confidentiality



**Anticipated Funding Level and Duration**

Funding Amount Range: \$ \_\_\_\_\_

Duration in Months: \_\_\_\_\_

**References**

List the key references cited in this RTAR