

TC 08.05 RESEARCH REPORT – JAN 2013 / DALLAS

The joint TC 1.3/8.5 Research Review Meeting was held Sun 27-Jan-2013, 3:00pm-6:30pm. The meeting began with an informal seminar (labeled a “forum” in the program) session titled “Fundamental Thermal Properties of New Lower GWP Refrigerants for Heat Transfer Analysis”. Presenters were as follows:

- Boiling of R1234ze On Enhanced Boiling Tubes
Eugene van Rooyen, Member, Ecole Polytechnique Fédérale de Lausanne, Lausanne, Switzerland
- Refrigerant Properties for Heat Transfer Analysis
Mark McLinden, Ph.D., Member, NIST, Boulder, CO
- Heat Transfer of Low GWP Refrigerants
Ankit Sethi, Member, Honeywell, Buffalo, NY
- Low GWP Refrigerant Convective Boiling in a Micro-Fin Tube
Mark A. Kedzierski, Ph.D., Member, National Institute of Standards and Technology, Gaithersburg, MD

Following the seminar, the one on-going project sponsored by TC 1.3 was reviewed: 1556-RP – Characterization of Liquid Refrigerant Flow Emerging From a Flooded Evaporator Tube Bundle.

Three URP's submitted to RAC were directed to TC 1.3 for review:

- 1679-URP: Development of General Method for Prediction of Heat Transfer During Boiling of Mixtures in Plain Tubes
- 1686-URP: Prediction of Heat Transfer During Boiling of Carbon Dioxide in Plain Tubes
- 1689-URP: Develop Correlations for Heat Transfer and Pressure Drop in Chevron Plate Type Refrigerant Evaporators

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

The RFP for 1677-TRP was released on 15-Oct-2012. Four proposals were received by the 15-Dec-2012 deadline. All four proposals contained very similar costs (\$207K-\$210K, relative to the \$210K estimated in the WS). One bidder offered a cost share that reduced their price to ASHRAE significantly. In reviewing the proposals, the PES encountered questions about the lowest cost proposal that needed to be addressed with the bidder. The timing of this process prevented the PES from being able to make a recommendation for bidder to the full committee. The PES expects that the questions will be addressed shortly after the Dallas meeting. They will then make a recommendation to the committee and a vote will be taken by email ballot.

PES members are: Ben Dingel, Satyam Bendapudi, Andeas Knoepfler, Satheesh Kulankara, Jon Cohen (TC 3.6, Water Treatment), James Schaefer (unofficial).

Other Ideas

Ideas suggested for research activities include:

- The Behavior of Lower GWP Refrigerants in Shell-and-Tube Heat Exchangers (by Justin Kauffman, Ken Schultz, Evraam Gorgy, Samuel Yana Motta)
- Evaluation of tube cleaning processes and techniques (by ???, co-sponsored by TC 8.2 and 3.6?)
- Water-side Fouling Performance of Coiled-Tube Type Condensers
RTAR was drafted by Jim Bogart back in Jun 2011. Probably 95% done; might need a dust-off and minor update.

Research Breakfast Notes

ASHRAE currently has 62 active projects with a total value of \$12 million. Since Jun 2012, 8 projects completed, 10 new projects started, and 6 TRPs released for bid (including our 1677-TRP). At this Dallas meeting, RAC evaluated only 3 RTARs; only 1 conditionally accepted. 4 Ws considered; only 1 conditionally accepted. Potential TRPs ready for Spring 2013 = 7. No Ws waiting to be released for bid. We are being encouraged to generate more research.

Nine URPs were received. Six were rejected. Three under review. ASHRAE/RAC continues to stress that URPs are only acceptable in exceptional cases.

63 candidates applied for grants-in-aid; 21 were selected @ \$10K/ea.

The student who performed the work for 1444-RP (Two-Phase flow in U-Bends) was the only applicant for the Homer Adams Award.

Innovative Research Grants are meant to provide seed money (up to \$125K) for novel research that could significantly advance the state-of-the-art in HVAC engineering. Last year, 18 pre-proposals were received, 5 were invited to submit full proposals; however, none were awarded.

Slides are attached at back.



Research Subcommittee Chairs' Breakfast Presentation

Winter Meeting 2013 – Dallas, TX
Agami Reddy, Vice Chair

Monday, January 27, 2013



Research Administration Committee



Agenda

- Current Projects
- **Herman Behls: Service to ASHRAE Research Award**
- WS and RTAR Status and Revisions
- Unsolicited Research Projects (URP)
- GIA, Homer and New Investigator Awards
- Innovative Research Grant (IRG) Proposals
- Announcements

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Service to ASHRAE Research This year's awardee:

Herman Behls, PE FASHRAE

- Nominated by TC 5.2 – Duct Design
- Mr. Herman Behls joined ASHRAE in 1965.

In past five years:

- Authored 3 RTARs and 5 WSs
- PES/PMS Chair for 5 research projects
- Research Chair for TC 5.2 for 10+ years.
- Leading effort to complete RP-1180 (Duct Design Guide) using TC volunteers after project was terminated with contractor.

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First mtg was 49 yrs ago. Involved with RP-2! \$1.3M to TC 5.2 over yrs.



Current Projects

- We have 62 active RPs
 - **Total value > \$ 12 million**
- Since June 2012:**
- **8** projects were completed.
 - **10** new projects were started
 - **6** Tentative Research Project (TRPs) released for bid *in Nov*

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WS and RTAR Status

- In Dallas, RAC evaluated 3 RTARs (1675, 1681, 1690)- rejected/ conditionally accepted/returned
- RAC evaluated 4 WS (1498, 1609, 1629, 1682)- returned/conditional accept/ returned/returned
- Potential TRPs ready for bid in spring 2013- 7
- WSs waiting to be released for bid: 0

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Why do RTARs get Returned?

- Most common reasons
 - Idea not appropriate for ASHRAE funding
 - Not adequate references to past work or existing literature
 - Not clear how project will "advance" the state-of-the-art
 - Budget does not seem in line with work to be completed

Research SC Chairs strongly encouraged to get feedback from Research Liaison during the breakfast meeting

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≥ \$ 200,000 has to go to BOD.



RTAR and WS Revisions

RAC is very serious in trying to reduce the effort of TC in preparing RTARs and WSs

RAC working on making revisions to both RTAR and WS submission format

"Acceptance of RTAR is no guarantee that WS will be funded"

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UNSOLICITED RESEARCH PROPOSALS

9 URP's being reviewed by RAC for funding with assistance of TC/TG/SSPCs

- 6 have been rejected- 3 others under review
- URPs keep increasing (last year there were 5)
- Some PI's and TC's may consider this as shortcut
- However this URP route is considered only acceptable in exceptional cases (RAC will clarify)
- Generally three types of URPs: extension of completed ASHRAE ~~completed~~ research, revision of a special publication, new research.

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UNSOLICITED RESEARCH PROPOSALS

- URPs have to be sponsored by a TC
- The shortcut may not work if the relevant TC is not supportive
- RAC's advise:
 - Convert this URP in cooperation with the TC into a Work Statement

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GRANTS-IN-AID (\$ 10k each)

- A letter announcing the availability of ASHRAE Grants-In-Aid for Graduate students was sent to over 300 colleges in October 2012.
- 63 candidates applied for a grant and 21 were selected by the RPS (last year we had 65 applicants and selected 23)

Changes to wording and guidelines to be done

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HOMER ADAMS AWARDS

- Meant for deserving graduate students who participated in an ASHRAE sponsored RP
- Only one applicant (Ricardo J. Da Silva Lima)-
*Ecole Polytechnique Federale de Lausanne
Switzerland*

Heat transfer and two-phase flows (RP-1444)

TC 1.3 in u-bends

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NEW INVESTIGATOR AWARD

- 7 researchers have been nominated for the award (5 nominations last year)
- RPS reviewed the applications and selected **Dr Panagiota Karava** of Purdue University

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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

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INNOVATIVE RESEACH GRANTS

- Last year was the first time that IRG was open for bids- we received **18** pre-proposals, **5** invited for full proposals, and **none** were awarded
- Language, guidelines and timeline were modified for the 2nd round
- Received **18** pre-proposals, will be discussed by RAC on Wednesday

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ANNOUNCEMENTS

- ASHRAE Research Strategic Plan 2010-2015 is the most current- use this as reference
- New plans will be on an 8-year update cycle
- New committee to be formed to prepare the next plan in July 2015 - *should be a driver to identify directions of RTAR and WS*
- RAC strongly encourages the submission of Ing hollistic research projects- such as “sustainability”

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ANNOUNCEMENTS

- Denver seminar/ forum- “How Can I participate in the ASHRAE Research Program?”
- Nominations to RAC membership- kindly email to Mike Vaughn, mvaughn@ashrae.org (self-nominations welcome)

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TC’s are encouraged to generate more research

- The number of RTARS (3) and WS (4) for RAC to evaluate was very quite low which may cause a shortage of promising research projects in the near future!
- It takes between 1-2 years before a WS (Work Statement) is accepted and a TRP (Tentative Research Proposal) is ready for bidding.
- If we don’t receive enough proposals during 2012/13 we will run out of projects.

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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

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Your Research Liaisons are ready to help you

- 1- Arthur Giesler
- 2- David John
- 3- Mark Spatz
- 4- Srinivas Garimella
- 5- Piotr A Domanski
- 6- Stephen Hancock
- 7- Phil Haves
- 8- David Yashar
- 9- Kishore Khankari
- 10-Pradeep Bansal

**Establish "Liaison" with
Research Liaisons**

26 Jul 2015

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