

TC 08.05 RESEARCH REPORT – JUN 2012 / SAN ANTONIO

The joint TC 1.3/8.5 Research Review Meeting was held Sun 24 Jun, 3:00pm-4:00pm. The TC 8.5 Main Committee Meeting was held on Mon 25 Jun, 4:15pm-6:30pm.

Neither TC 1.3 nor TC 8.5 has any active research projects at this time. The Sunday evening Research meeting consisted of idea generation and discussion. These were further discussed and refined during the Monday Main Meeting.

Lower GWP Refrigerants

The Lower GWP Refrigerants MTG is considering authoring an RTAR to determine the heat transfer characteristics of the two new low GWP refrigerants, R1234yf and R1234ze(E).

Should this testing be for shell-side and/or in-tube evaporation and/or condensation? It was also noted that there are low pressure candidates as well.

It was noted that the LCTM at EPFL (Thome's Lab) recently published the results of pool boiling tests on enhanced tubes with R134a, R236fa, and R1234ze(E): E van Rooyen and JR Thome, "Pool Boiling on Enhanced Boiling Tubes with R-134a, R-236fa and R-1234ze", presented at the ECI 8th International Conference on Boiling and Condensation Heat Transfer, Ecole Polytechnique Fédéral de Lausanne, 3-7 Jun 2012, Lausanne, Switzerland.

It was suggested that generalized models are needed for areas such as in-tube flow boiling of refrigerant blends, boiling and condensation in plate heat exchangers, etc.

It was proposed to write an RTAR on boiling in flooded evaporator bundles with new low GWP refrigerants (Kaufman to lead).

1677-WS Measurement and Prediction of Waterside Fouling Performance of Internally Enhanced Tubes in Cooling Tower Applications. *lead author: Ben Dingel*

This work statement has been conditionally approved by RAC, so is now 1677-TRP-C. Our research liaison reported that RAC had two comments. First, the title should be edited to clarify that "condenser" tubes are the point of the study. The TC voted (10/0/0) to add the word "condensers" to the title (and drop "in Cooling Tower Applications" if necessary). Second, the work statement should provide prospective bidders with estimates of time that it might take to execute the test matrix. We will work with our research liaison to satisfy these requests. If completed by 15-Sep, this work statement could go out as an RFP for bids this Fall.¹

Other

AHRI is proposing to revise Guideline E. They would like to include information gained from 1345-RP (Fouling in BPHE's). Volunteers were requested. Expect process to take 3 months to 1 year.

¹ Revised work statement was submitted to MORTS on 14-Sep-2012.

It was noted that results of the EPFL (1089-RP) and KSU (1316-RP) bundle boiling projects have been included into the latest revision of Chapter 5, Two-Phase Flow, for the 2013 Handbook of Fundamentals.

Research Breakfast Notes

Slides from the Research Breakfast are attached at back.

28 projects were completed over the last period. 19 new projects have been awarded. There are now 62 active projects of which 11 are in a closing phase. 4 work statements were conditionally approved for possible bid this Fall (including our 1677 – Fouling in Enhanced Condenser Tubes); 2 WS's were already in the hopper, making a total of 6 WS's for this Fall. The budget is sufficient to support all WS's ready for bid.

The numbers of RTAR's and WS's being submitted is quite low at this time. TC's are strongly encouraged to submit more RTAR's and WS's. Research budget for 2013 is projected to be ~\$2.7M.

Although URP's can still be submitted, RAC prefers that TC's follow the RTAR/WS path so that competitive bidding opportunities exist as much as possible.



Research Subcommittee Chairs' Breakfast

Winter Meeting 2012 – Chicago
Jaap Hogeling, Vice Chair, RAC

Monday, January 23, 2012



Agenda

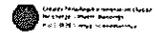
- 1. Service to ASHRAE Research Award presentation to **Dru Crawley**
- GPIC-HUB – a new opportunity for TC's to get research sponsored
- Awards
- Current projects and and TRP Status
- Why are my RTARs and WSs being returned?
- Meet with Research Liaisons



Service to ASHRAE Research This year's awardee:

Drury B. Crawley, PhD, F ASHRAE

- Nominated by TC 4.2 – Climatic Information
- Dr. Dru Crawley joined ASHRAE in 1979. active in 16 PES for research in TCs 4.2 and 4.7 and the Energy Targets Implementation MTG.
- Chair of 6 PES, participated in 14 PMS (4 times as Chair), Research Chair for TC 4.2 for 16 years
- Research Chair for TC 4.7 for 2 years.
- A 4-year tour on RAC, as RL to Section 9



Greater Philadelphia Innovation Cluster
(GPIC)
for Energy-Efficient Buildings

A U.S. DOE Energy Innovation Hub
The Navy Yard, Philadelphia
<http://gpic-hub.org>
GPIC for Energy Efficient Buildings



The GPIC Great Philadelphia Innovation Cluster

The U.S. Department of Energy's HUB for Energy Efficient Buildings
Strategic focus of the GPIC is on full-spectrum retrofit of average size commercial, multi-unit residential, and mixed (commercial and multi-unit residential) buildings.

The location for the GPIC the 1,200 acre Navy Yard in Philadelphia which includes 270 existing and new buildings that can be utilized as test beds, and an independent unregulated micro-grid.

The goals of the GPIC are to transform the delivery process of the building retrofit industry in the Greater Philadelphia region from a serial fragmentation to an integrated product design and delivery method that optimizes whole building system efficiency and performance. This requires:

1. Improving system design tools
2. Integrated building component and subsystem technologies
3. Supportive public policies and market and behavioral incentives
4. Customer value propositions focused on systems performance benefits
5. Business models that quantify profits realized by the integrated systems approach
6. A skilled workforce to insure optimal performance of integrated subsystems



GPIC Opportunity Research Fund (ORF)

- About \$10 million over five years allocated for ORF
- Grants of between \$100,000 and \$250,000 to support research, development, demonstration, and deployment of technologies, policies, business models, and training programs that advance GPIC goals.



GPIC Opportunity Research Fund

- Primary proposal evaluation criteria: Degree to which the ORF funding is critical in advancing an opportunity to wide scale deployment
- Teams must include at least one of the 24 GPIC member organizations and must also include at least one non-member organization
- Seven projects awarded in 2011 totaling \$1.3 million of DOE funding

23-01-2012



7



GPIC Opportunity Research Fund 2012

- Two ORF RPS will be issued
- Spring of 2012
- Summer of 2012
- **Michael Vaughn will be notified when each RFP issues and will inform TC Research Chairs**

See www.gpicclub.org or meet Rich Sweetser who is the GPIC consultant in RAC

23-01-2012



8



GRANTS-IN-AID

- A letter announcing the availability of ASHRAE Grants-In-Aid for Graduate students was sent to over three hundred colleges in October 2011.
- 65 candidates applied for a grant and will be evaluated by the Research Planning Subcommittee at the winter meeting. (last year we had 66 applicants)

→ 22 awards expected

23-01-2012

9



NEW INVESTIGATOR AWARD

- 5 new researchers have been nominated for the award.
- The Research Planning Subcommittee will review the applications at this Winter Meeting for the Society year 2011-2012 award.

23-01-2012

10



Current projects

- The 2011-2012 fiscal year began with 71 projects under contract. 13 new projects awarded for the year so far include: 1410-RP, 1413-RP, 1458-RP, 1495-RP, 1499-RP, 1504-RP, 1550-RP, 1557-RP, 1564-RP, 1584-RP, 1592-RP, 1604-RP, and 1606-RP.
- 16 projects were completed. The completed projects are as follows: 1235-RP, 1316-RP, 1320-RP, 1332-RP, 1333-RP, 1335-RP, 1339-RP, 1365-RP, 1387-RP, 1388-RP, 1390-RP, 1418-RP, 1444-RP, 1466-RP, 1472-RP and 1486-RP.
- Of the 71 active projects under contract 12 projects (1180-RP, 1322-RP, 1339-RP, 1344-RP, 1345-RP, 1356-RP, 1416-RP, 1431-RP, 1448-RP, 1476-RP, 1487-RP, and 1522-RP) are currently being evaluated to determine if they can be closed

23-01-2012



11



Research Funding Status

- **TENTATIVE RESEARCH PROJECTS**
10 TRPs were released for bid in fall 2011.
- **WORK STATEMENTS**
5 approved "on hold" or "pending" ready for bid or rebid in spring 2012 provided sufficient funding.

23-01-2012



12

ASHRAE UNSOLICITED RESEARCH PROPOSALS

5 URP's will be discussed for funding by the reviewing TC/TG/SSPCs and will be considered by RAC and Tech. Council in Chicago if recommended for funding by a TC/TG/SSPCs.

- RAC received an unusual number (5) of URP's
- 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 in more detail what may be considered as exceptional.

23-01-2012 13

ASHRAE RESEARCH IMPLEMENTATION PLAN

- The Society Research Implementation Plan currently consists of 53 research topics in various stages of development prior to contract award (23 RTARs, 14 WSs, and 16 TRPs).
- Last year at this time we had 64 topics.

6 RTAR's sub.mitted prior to this meeting.

23-01-2012 14

ASHRAE TC's are encouraged to produce more projects

- the current number of RTARS (6) and WS (2) for RAC to evaluate is 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.

23-01-2012 15

ASHRAE New RTAR coversheet

- Be aware to use this new coversheet
- Improved layout and easy to fill in fields in the word template
- -the questions :
 - Has an electronic copy been furnished to the MORTS?
 - Has the Research Liaison reviewed the RTAR?
- helping to remind that it is beneficial to consult your RL before sending the RTAR.

23-01-2012 16

Research Topic Acceptance Request Cover Sheet

(Please Check to ensure the Following Information is in the RTAR)

A. Title	<input type="checkbox"/>	Title	_____
B. Justified by ASHRAE Research Program	<input type="checkbox"/>	RTAR#	_____
C. Application of the Results	<input type="checkbox"/>	Results of this Project will affect the following Handbook Chapter	_____
D. Method/Field Development	<input type="checkbox"/>	Special Publications, etc.	_____
E. Advancement to State-of-the-Art	<input type="checkbox"/>	Responsible TC/TS	_____
F. Justification and Value to ASHRAE	<input type="checkbox"/>	For: <input type="checkbox"/> Applied <input type="checkbox"/> Building <input type="checkbox"/> Ambient and Indoor Climate <input type="checkbox"/> Total Voting	_____
G. Objective	<input type="checkbox"/>	Date of Visit	_____
H. External Division	<input type="checkbox"/>	Comments TO/TG/TC/SSPCs (use only one side)	_____
I. References	<input type="checkbox"/>	_____ _____	_____

RTAR Lead Author: _____
Approved Work Statement Lead Author: _____
Research Classification: (Research/Research, Educational, Community, or Technology Transfer) _____

Has an electronic copy been furnished to the MORTS? Yes No
Has the Research Liaison reviewed the RTAR? Yes No

* Reasons for negative votes and annotations

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

23-01-2012 17

Budget looks good. Money available.

ASHRAE 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
- Its about communicating your idea clearly

23-01-2012  19

ASHRAE Your Research Liaisons are ready to help you, the names for each Section

• 1- Arthur Giesler	• 6- Stephen Hancock
• 2- William McCoy	• 7- George A Jackins
• 3- Donald Bivens	• 8 Garimella Srinivas → 4
• A Pradeep Bansal	• 9- Carl F Huber
• 5- Piotr A Domanski	• 10 David Yashar – 8

Meet with Research Liaisons

23-01-2012  20

Next deadline: 15-Feb
for review at Spring meeting.

Next deadline: 15-May
for review at Summer meeting.

URP-1660

Tube Fungus — interest to cosponsor by TC 8.2.
check with TC 3.6 Water-Treatment