TC 08.05 RESEARCH REPORT – JUN 2011 / MONTREAL

The joint TC 1.3/8.5 Research Review Meeting was held on Sun 26 Jun, 3:00pm-5:20pm, with about 25 attendees, and the TC 8.5 Committee Meeting was held on Mon 27 Jun, 4:15pm-6:30pm, during the 2011 Annual Meeting in Montreal.

ACTIVE PROJECTS

1316-RP: Experimental Evaluation of the Heat Transfer Impacts of Tube Pitch on a Highly Enhanced Surface Tube Bundle. *PI: Steve Eckels, Kansas State Univ. PMS: Petur Thors (chair), Ben Dingel, Satheesh Kulankara, Axel Kriegsmann. Status: active (start date: Jan-2006. original target completion date: Jul-2008. extension #1 granted Salt Lake City mtg, Jun08: Jul-2009. extension #2 granted Louisville mtg, Jun09: Jul-2010. extension #3 granted Albuquerque mtg, Jun10: Apr-2011. extension #3B granted Las Vegas mtg, Jan11: Jun-2011.)*

The draft final report is in the last stages of completion. The final report consists primarily of the PhD thesis by student Evraam Gorgy. The thesis was successfully defended and has been reviewed by a technical editor. [Post-meeting: The original draft report (as sent to the technical editor) was delivered by email to the PMS and MORTS on 30-Jun to meet the impending (extended) end date for the project.]

The PMS is to review the draft final report in a timely manner and will address any questions and comments back to the PI with respect to contract deliverables. When outstanding issues are resolved, the PMS is to submit a recommendation to the full committee. An email ballot will then be conducted. Petur will then fill out and submit the Disposition of ASHRAE Research form.

1345-RP: Waterside Fouling Performance of Brazed-Plate Type Condensers in Cooling Tower Applications. *PI: Lorenzo Cresmaschi, Oklahoma State Univ. PMS: Jim Bogart (chair), Art Fovargue, Axel Kriegsmann, Ken Schultz, Xudong Wang (ARTI cofounding). Status: active (start date: May-2008. original target completion date: Oct-2010. extension #1 granted Albuquerque mtg, Jun10: Oct-2011.)*

Testing has now been completed for the A1 (soft) and A2 (hard) geometries with medium fouling potential water (at 105°F) and at the elevated refrigerant saturation temperature (120°F) with high fouling potential water. The data are all relatively consistent, although some questions exist regarding the very first test of the A1 (soft) geometry with high fouling potential water. The fouling resistance appears to be somewhat elevated during early testing.

To address this question, the first test will be repeated as a check. The test will be run only as long as necessary. The PI has also acquired a straight tube-in-tube (smooth inside) heat exchanger and will test this to provide a link between the BPHE testing done here and possible future testing of straight tubes (smooth and enhanced). Delivery of the draft final report is targeted for the end of October.

FUTURE PROJECTS

The completion of the above two projects will leave TC 8.5 with no on-going research projects. We are in need of new research ideas turned into RTAR's. (TC 1.3 is also in a similar position. On-going research projects have all been completed. 1556-TRP is ready and waiting in the queue to go out for bids.)

Jim Bogart is working on a draft RTAR entitled "Waterside Fouling Performance of Coiled-Tube Type Condensers in Cooling Tower Applications". We are working to come up with some measure or indicator of the importance of fouling to the performance of equipment using coiled coaxial heat exchangers. The draft RTAR should be ready for distribution to and review by the committee shortly. TC 3.6 might be interested in cosponsoring such work. Some time back, AHRI was interested in co-funding this work.

Ben Dingel again expressed interest in drafting an RTAR to revisit fouling in enhanced chiller tubes. In addition to making another attempt to collect fouling data, this project would also look at how the fouling resistance is modeled/described for using in design and performance rating. TC 8.2 has also expressed interest in this topic. TC 3.6 might also be interested in cosponsoring such work.

The topic of low GWP refrigerants has been on the table for awhile now. There has been discussion of coordinating research activities between a wide range of TC's, including 1.3, 3.1, 8.2, 8.4, 8.5, 8.11, and 10.6. Omar Abdelaziz volunteered to take a shot at this, looking into the possibility of setting up a Multidisciplinary Task Group (MTG) around this. A forum for Chicago was proposed as a way to discuss this topic and identify research needs. If the forum did not get accepted and given a time slot during the conference program, it would be scheduled during our usual TC 1.3/8.5 research meeting time.

On the other hand, there was some consensus at the Montreal meeting to get something started that was more limited in scope to primarily TC 8.5 interest. In addition to the general topic of testing the heat transfer behavior of low GWP refrigerants, the behavior of zeotropic refrigerant blends in certain refrigerant-to-liquid heat exchangers was raised as a specific topic. Samuel Yana-Motta volunteered to begin drafting an RTAR in this area.

Omar raised the topic of investigating CO_2 gas-coolers in domestic hot water heat pump systems.

The next RTAR submission deadlines are ~15-Aug (maybe 12-Aug/Fri?) and ~15-Dec. If an RTAR can get approved at the Oct RAC meeting, it might be possible to have a WS ready by 15-Dec.

MISC NOTES

Seventeen projects were sent out for bid in Spring 2011. There are 10-14 TRP's currently in the queue for bidding opportunities. However, the existing budget will allow only 2 of these to go out for bid this fall. Those in the queue will be prioritized at the Oct RAC meeting. It appears that there is little the TC's can do to affect the position of a TRP on the list.

DOE has launched three Energy Innovation Hubs that will help advance highly promising areas of energy science and engineering.[1] The Greater Philadelphia Innovation Cluster (GPIC) has been selected to run the Energy-Efficient Buildings System Design Hub.[2] GPIC is led by Penn State and is located at the Philadelphia Naval Yard. An objective is to promote energy efficient building systems, designs, and best practices with a focus on existing small commercial buildings. $129M in funding is available over a 5 year period. ASHRAE leadership is reviewing a Memorandum of Understanding to allow participation in the Hub; looking for ways to meet GPIC's need for fast results with ASHRAE's technical rigor.

ASHRAE is developing an "Innovative Research Grant" with the objective to encourage and support high risk outside-the-box research that shows potential for significant advancement in technology. It is sort of a URP process, but doesn't go through the TC's. ASHRAE is projecting to fund up to one project per year at a level of $50K/yr for two years with another $25K in industry matching funds ($125K total). The program is slated to ready by Fall 2012.

The new research liaison for Section 8 is David Yashar of NIST – this is a last minute change from Srinivas Garimella as listed in the recently distributed roster.

[1] See http://www.energy.gov/hubs/index.htm. [2] See http://www.energy.gov/hubs/eric.htm.