

2012 ASHRAE ANNUAL MEETING
San Antonio, TX

TC8.11 Unitary and Room Air Conditioners and Heat Pumps
Monday, June 25, 2012 4:15 – 6:30 PM
Location: (H) Lone Star D (2)

Theme/Logo



2012 ASHRAE Annual Conference

June 23–27/San Antonio, TX

Sponsored Program

None

Full Committee Agenda

1. Call to order Horak
 - a. Meeting was called to order at 4:15 p.m.
2. Introductions All
 - a. Introductions were made.
3. Determination of a quorum Horak
 - a. Quorum was met. 9 voting members present.
4. Announcements and Highlights Horak

From TC Chairs Breakfast Meeting

 - a. **2012-2013 Hightower Award Nomination Process and Deadline**
 - b. Nominations for the 2012-2013 George B. Hightower Technical Achievement Award are due to you Section Head by **September 1, 2012**. The award recognizes outstanding technical leadership and contributions on a TC/TG/TRG during the past Society year, excluding research and standards activities. Please go to the Technical Committee page of the ASHRAE website at the following link under the "Procedures and Forms..." heading: <http://www.ashrae.org/standards-research--technology/technical-committees>
 - c. **New MTGs that have been formed**

TAC approved the formation of the following two new Multidisciplinary Task Groups (MTGs):

MTG.LowGWP – Alternative Lower Global Warming Potential Refrigerants

Scope: MTG.LowGWP will coordinate will coordinate TC/TG/TRG technical activities to help transition the HVAC&R industry to sustainable lower Global Warming Potential (GWP) alternative refrigerants. The MTG will further request participation from US EPA and AHRI. The MTG responsibilities include suggestions for research, development and presentation of technical programs of all types on alternative lower GWP refrigerants, suggestions for Life Cycle Climate Performance (LCCP) systems evaluation for different applications, development of lower GWP

solutions for different applications, and a special publication detailing aspects of LCCP applied to the HVAC&R fields.

MTG.EAS – Energy-Efficient Air Handling Systems for Non-Residential Building

Scope: MTG.EAS will coordinate activities of related ASHRAE technical and standards committees to facilitate development of packages of tools, technology, and guidelines related to the design, operation, and retrofit of energy-efficient air-handling systems in new and existing non-residential buildings. The intent is that these products can be integrated with industry processes and can be used to ensure that ASHRAE energy saving targets are met, to carry out high-profile demonstrations of improved air-handling systems, and to identify further energy saving opportunities. Within ASHRAE, the MTG also will coordinate activities to update related parts of ASHRAE Handbooks and Standards (particularly 90.1, 62.1, and 189.1) and to develop related education programs for technology implementers. Outside of ASHRAE, the MTG will monitor related activities and represent ASHRAE interests where permitted to provide a conduit for related information transfer to ASHRAE members. MTG.EAS is concerned with the interactions between non-residential air-handling system components, the building, and related activities, which include at least the activities of TCs 5.1 (Fans), 5.2 (Duct Design), 5.3 (Room Air Distribution), 1.4 (Control Theory and Application), 1.11 (Motors and Motor Controls), 1.8 (Mechanical System Insulation), 4.3 (Ventilation Requirements and Infiltration), 4.7 (Energy Calculations), 7.7 (Testing and Balancing), 7.9 (Building Commissioning), 7.1 (Integrated Building Design), 6.3 (Central Forced Air Heating and Cooling Systems), and 9.1 (Large Building Air-Conditioning Systems), as well as TRG7 (Under Floor Air Distribution) and TG3 (HVAC&R Contractors and Design Build Firms). For more information on these two MTGs and the four other MTGs, please go to the MTG section on the following web page:

<http://www.ashrae.org/standards-research--technology/technical-committees>

d. **Thank You Letters to Employers**

ASHRAE President – Ronald E. Jarnagin – has offered to send letters to the employers of TC volunteers this year thanking them for supporting their employee's service on an ASHRAE TC during Society year 2011-2012. If requested by the volunteer, the letter will be sent to his/her employer by the end of July or early August and the volunteer will receive a copy.

e. **Option for TC Subcommittee Meetings via Conference Calls and Web Meetings**

More and more TCs are taking advantage of a new Society service that allows TCs to hold subcommittee meetings by phone and/or web. Many TCs are finding this to be a more efficient way for them to conduct subcommittee business and it also allows TC members that can't travel to meetings on a regular basis a way to still contribute to the TC. Such a change can also eliminate potential conflicts with the TC's program sessions at Society meetings. Please pass your conference call/web meeting/webinar requests on to the Manager of Research and Technical Services, Mike Vaughn, at mvaughn@ashrae.org or MORTS@ashrae.net

f. **Upcoming Program Dates**

Dallas Meeting - January 26-30, 2013

- Conference site live: January 22, 2012

- Conference Paper abstract/Conf. Paper session proposals due March 19, 2012
 - Conference Papers submitted for review are due early July 2012
 - Dallas seminar and forum session proposals are due early **August 2012**
 - Conference Website: <http://www.ashrae.org/dallas/>
 - Track 1** - HVAC&R Systems & Equipment
 - Track 2** - HVAC&R Fundamentals and Applications
 - Track 3** - Standards, Guidelines, and Codes
 - Track 4** - Energy Conservation
 - Track 5** - Refrigeration
 - Track 6** - Large Building Design
 - Track 7** - Facility Management; Operations, Tech. and Energy Improvements
 - Track 8** - Special Interest Track
- Denver Meeting** - June 22-26, 2013
- Conference Site Live: June 20, 2012
 - Conference Paper Abstract/Full Technical Papers due September 24, 2012
 - Denver Seminar and Forum Session Proposals are due February 11, 2013
 - Conference Website: <http://www.ashrae.org/denver/>
- g. **Upcoming Workshops and Conferences:**
- 10th IIR Gustav Lorentzen Conference 2012** (Natural Refrigerants), June 25-27, 2012 – Delft, <http://www.gl2012.nl/>
- 10th International Conference - Healthy Buildings 2012** – July 8-12, 2012 – Brisbane, Australia - <http://hb2012.org/>
- U.S. National Committee - IIR Refrigerants Short Course**
July 14-15, 2012, on the campus of Purdue University in West Lafayette, Indiana See attached handout for additional information on the short course. On-line short course registration by credit card can be made at: https://engineering.purdue.edu/Herrick/Events/2012Conf/about_shortcourse.html
- Purdue Summer Conferences 2012**
21st International Compressor Engineering Conference,
14th International Refrigeration and Air Conditioning Conference
2nd International High Performance Buildings Conference
July 16-19, 2012, on the campus of Purdue University in West Lafayette, Indiana
<http://engineering.purdue.edu/Herrick/Events/2012>
- Seventh Annual New Energy Symposium**, July 18, 2012 | 8:00 AM - 7:00 PM
New York Academy of Sciences, NY - <http://www.nyas.org/2012NewEnergy>
- SimBuild 2012** - August 1-3, 2012 - Madison, WI – website: <http://www.ibpsa.us/simbuild2012/>
- COBEE (2ND International Conference on Building Energy & Environment)**,
August 1-4, 2012, Millennium Harvest House, Boulder CO
<http://www.colorado.edu/cobee2012>

ASHRAE HVAC Design Workshops, August 6-10, 2012, ASHRAE HQ, Atlanta, GA

<http://www.ashrae.org/education--certification/workshops/hvac-design-workshops>

ICCCS 2012- International Symposium on Contamination Control 2012,

September 3-7, 2012, ETH Zurich, Switzerland <http://icccs.net/>

12th Cryogenics 2012, IIR International Conference, September 10-

14, 2012, Dresden, Germany, <http://www.icaris.cz/conf/Cryogenics2012>

4th Jordanian IIR International Conference on Refrigeration and Air Conditioning, 4th JIIRCRAC, September 10-12, 2012, Amman-Jordan,

Website: <http://jnciirconf.ju.edu.jo>

ASHRAE Energy Modeling Conference Tools for Designing High Performance Buildings

– Oct. 1-2 , 2012 – Atlanta, GA -

<http://ashraem.confex.com/ashraem/emc12/cfp.cgi>

AHR Expo Mexico – September 25-27, 2012 – Monterrey, Mexico

<http://www.ahrepomex.com/eng/>

3rd IIR Workshop on Refrigerant Charge Reduction in Refrigerating Systems –

RCR 2012, October 25-26, 2012 – Valencia, Spain, Website:

<http://www.imst.upv.es/iir-rcr2012>

ASHRAE/NIST Refrigerants Conference: Moving Towards

Sustainability, October 29-30, 2012 – Gaithersburg, Maryland, Website:

<http://www.ashrae.org/membership--conferences/conferences/ashrae-conferences/ashrae-nist-refrigerants-conference>

Cold Climate HVAC 2012, November 12-14, 2012, Calgary, Alberta, Canada.

<http://www.ashrae.org/events/page/coldclimate2012>

2nd IIR International Conference on Sustainability and the Cold

Chain, April 2-4, 2013, Paris, France. www.iccc2013.com. Abstract

submission deadline: July 15, 2012

5th International Conference Ammonia Refrigeration Technology,

May 9-11, 2013, Ohrid, R. Macedonia, <http://www.mf.edu.mk/en/> Abstract

submission deadline: September 30, 2012

ASHRAE IAQ 2013 – Environmental Health in Low Energy Buildings,

October 15-18, 2013, Vancouver, BC, Canada www.ashrae.org/IAQ2013.

Abstract and initial workshop proposals submission deadline: December 15, 2012

h. **NEW ASHRAE Terminology WIKI Launched**

Over 6,000 definitions for terms found in ASHRAE publications can now be seen in the new free ASHRAEwiki, a centralized resource for referencing terminology definitions. Visit ASHRAEwiki.org for numerous building terms focusing on mechanical, envelope, electrical, lighting, load calculations, design, water design/conservation and more.

<http://wiki.ashrae.org/index.php/ASHRAEwiki>

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|-------------------------------------|----------|
| 5. Agenda additions | All |
| a. None | |
| 6. Liaison reports (as they arrive) | Liaisons |

The handbook liaison reminded the TC that to meet the publication deadline for the next version of Applications, the TC will need to vote to approve Chapter 1, Residences,

at the Seattle meeting in 2014. The handbook chair, Dutch Uselton, presented the handbook liaison with a summary report of the progress achieved so far for Chapter 1.

Section 8 Head Steve Duda presented a certificate of appreciation to the chair, Byron Horak, for his two years of service as chair of TC 8.11. He then asked for any comments or questions about the information from the TC chairs meeting. Hearing none, he concluded his report.

7. Approval of minutes from Chicago Berg
 - a. Eric Berg requested that someone make a motion to approve the minutes from Chicago. Darren Nutter moved to approve the minutes from Chicago. Van Baxter seconded the motion. The motion passed 9-0-0.

8. Membership/Roster Horak
 - a. The roster will be updated to add 3 people as corresponding members that did not get added at the last meeting. Two additional corresponding members will also be added. Chris Stone will be made a voting member.

9. Subcommittee reports Mark Spatz
 - a. Programs
 - i. San Antonio Programs
 1. The seminar "Measurement Issues and Improvement Opportunities to ASHRAE Standards That Affect Air Conditioner and Heat Pump SEER and HSPF Ratings" chaired by Craig Messmer and submitted for San Antonio was not accepted.
 2. There was interest expressed in resubmitting possibly with one additional speaker. Dane Christiansen provided a list of potential speakers. Some re-work of the title and abstract to highlight the significance of this topic is planned.
 3. Mark Spatz made a motion to re-submit this seminar for the Dallas meeting. Van Baxter seconded the motion. The motion passed 9-0-0.
 - ii. Dallas Programs
 1. Dane Christensen submitted three abstracts for a conference paper session entitled: "Game Changing HVAC, Coming soon to an Installer Near You!"
 - The three papers are Ground-source Integrated Heat Pump for Existing Residential Market, Fuel-fired Multi-function Heat Pump, and Desiccant Enhanced Evaporative A/C.
 2. New Methods for Performance Predictions for Unitary Equipment – Conference Paper Session. Vance Payne
 - Five abstracts were submitted and accepted.
 - iii. Future program topics
 1. Review of upcoming standards and their impact on the industry from 3 different perspectives
 - Government (DOE) – potential speaker Ashley Armstrong
 - Manufacturer Impact – Kevin Mercer volunteered to speak about impact on residential applications. Could also add another speaker on commercial applications.
 - End User Impact – maybe from a representative from ACCA
 - John Douglas (Lennox) volunteered to chair the session
 - Could include a presentation on regional standards as well (Ram?)
 - Target Denver meeting for seminar
 2. Performance and Issues Relating to Use of LGWP Refrigerants
 - Could get results from AHRI AREP program

- Targeting Denver for seminar, or New York for conference paper session
- 3. High Ambient Operation of Unitary A/C and Heat pumps
 - Impact of region standards
 - More emphasis on EER vs SEER
 - Compressor viewpoint
 - Not strong interest from those attending the program subcommittee meeting.
- 4. Integrated Multi-Function Heat Pumps
 - There has been more interest in these devices lately.
 - SPC 206 currently working on a method of test standard
 - No suggestions for speakers or papers
- iv. Call for new topics
 1. None
- v. Mark Spatz announced that this would be his last meeting as programs chair and called for volunteers to take his place. No one volunteered at that time.

b. Research

Ray Rite

- i. Research Chairs Breakfast Highlights
 1. Service to ASHRAE Research award nominations need to be in by 30 September.
 2. IRG: Innovative Research Grants: 5 proposals reviewed. All rejected. Not innovative enough. Will rework directions for application.
 3. Research Funding Status
 - 2011-12: 62 projects under contract, 28 completed
 - RAC has evaluated 5 RTARS and 24WS, too low a number. There is a concern that we could run out of projects for 2012-13. Get your RTARs in!
 - New RTAR cover sheet on website and some modifications to process.
 - Use your liaison: submit to them for review. They cannot fight for your RTAR/WS if they don't understand what it is. David Yashar is research liaison for TC 8.11.
 - Why are RTARS returned: idea not appropriate, inadequate references, not clear how it will advance SOTA, budget out of whack.
 - Deadlines for RTARs and WSs: 15 May, 15 August, 15 December.
 4. The full presentation is attached.



AnnualMtg_2012_ResearchBrkfst.pdf

- ii. Ray Rite requested that the subcommittee meeting be extended by an hour and asked for audio visual equipment be provided to facilitate research project reports.
- iii. RP-1581- First Presentation to PMS - Dr. Mike Pate, Texas A&M
 1. Dr.Pate – Texas A&M , Josh Cading – Lab Manager at TAM Riverside Lab, and Grant Wheeler-MS Student
 2. Contract signed 5/1. They have already begun work.
 3. Presentation by Grant. PowerPoint distributed. Due to time constraints were not able to address any of their questions. Meeting was held with PMS before regular meeting on Monday to address issues. Since not all PMS members were in attendance, will be followed up a conf call in next 30 days. Eric

Berg to coordinate. Also, thought of visit by TAM team to Lennox or Trane came up or PMS going to TAM to view test facility.

- iv. WS-1608 - Development of a Load-Based Method of Test for Lt. Comm. Unitary HVAC (Reid Hart)
 1. From Subcommittee Meeting
 - Status: Sent to RAC in April, rev. requested. Tried to re-submit in May, but missed deadline for vote. The latest version will need to be voted on in San Antonio. Final deadline is 10/1/2013.
 - Update: Project has been scaled back to just research load based testing only. There was discussion on the ability to do a load based test with usual facilities. Milestones in place to stop and access feasibility before moving on. Xudong Xu from AHRI expressed their concern and were not supportive of this effort. Reid Hart forwarded to Xudong how he addressed their concerns with the original RTAR and gave Xudong a copy of the current WS for circulation to large unitary group at AHRI.
 2. Load based testing. Scaled back scope to see if load based testing is possible. Changes since last successful email ballot non-substantive. Co-sponsored by 7.6 Building Energy Performance
 3. Dutch Useton
 - Feels that work statement progression is backwards. Should determine what data is needed first, then test it to get the data.
 - The two parts are to be run in parallel. Could reference existing data.
 - Make sure equipment is exposed to a constant sensible load. Concerned that latent load should not be ignored. Feels that there should be some method of controlling the latent load described in the work statement.
 - There are some sections that repeat the same information. It is also a little long.
 4. Hung Pham
 - Asked if the objective of this would be a test standard
 - Objective is to find a method of test for a system as applied. Then use the data for a simulation.
 - Suggested to limit scope to testing only the economizer.
 5. Ray Rite – Moved that TC 8.11 approve WS and send to RAC
 6. Van Baxter seconded the motion
 7. Discussion – Craig Messmer asked if the work statement would be revised. Motion was modified to “TC8.11 to approve WS and send to RAC subject to potential modification by August 1st.”
 8. Vote – 8-0-1
- v. WS-1642 - Improved Cmpr. Perf. Modeling Methodology for use in Sys. Sim. Programs (Ray Rite)
 1. From Subcommittee Meeting
 - Status: Final deadline is 5/13/2013.
 - Update: WS written. Not a lot of changes from RTAR just expounding upon. Ray participated in conf call with AHRI Small Unitary and Compressors on 8 June. Unitary favors, Compressor Section does not, so no approval of co-funding yet. AHRI sections to meet within the month to try to reach common ground. Quite a bit of discussion ensued.
 - Hung Pham- Copeland brought up that systems should discuss with compressor section what the requirements

are on range and uncertainty. System simulation is different than comparing compressors. Need to define where system accuracy is needed. Don't deal with manu. repeatability. Do we need a separate model for system purposes outside compressor comparison modeling? Comments were also made about a need to be clearer on whether this project is just modeling or has lab testing. If there is lab testing, need better definition of test matrix and budget for facility modifications too low.

- Ray thought that TC 8.11 should vote to promote this to RAC and then let AHRI work on their concerns. RAC can consider all this during their decision making. However, Ray will address the comments made in the meeting and then submit to TC 8.11 for a letter ballot within the next month.
 - 2. AHRI has not made a decision about co-funding
 - 3. Mark Olsen commented that the AHRI meeting that discussed the update to AHRI-540 would not address what this research would be looking at.
 - 4. Hung Pham commented that the AHRI-540 curve is meant as a compressor comparison and to be accurate at the conditions tested. Would like to see the simulation needs better defined. Warned that a physical model may not be accurate, or as accurate as the 10 coefficient equation.
 - 5. Michael Hughes commented that the work statement needs to define the number of compressors in order to define a test matrix. If data exists, then part of the matrix could be removed. Concerned about cost included for a bidder that did not have existing facility, should be more than \$4000.
 - 6. Ray to revise work statement and then vote on it by letter ballot.
 - 7. Question was raised about if approval was contingent on co-funding from AHRI.
 - 8. Need to add to the budget for technician support.
- vi. Co-sponsor
- 1. WS-1645 - A Research Study to Determine and Compare New Accelerated Corrosion Tests for Microchannel and Standard Tube & Fin Heat Exchangers – TC 8.4
 - Status: TC 8.4 will have their vote on 6/26. If that goes well, TC 8.11 would need a letter ballot.
 - 2. *"Investigation of Air-side Fouling on Outdoor Condensing Heat Exchangers"*
 - Status: *Still under development at TC 8.4.*
 - 3. SSPC 41 - Unitary MOT Sample Tree and Air Mixer Specifications and Unitary Airflow testing with nozzles
 - Update: Went to SSPC 41 meeting. SPC's don't sponsor research. TC 8.11 would sponsor, SPC 41 co-sponsor. Plan is by September 1, forward volunteers from 8.11 who want to develop these RTARS. SPC 41 will also forward volunteers. Small group collaboration amongst the volunteers here to get an RTAR out. Looking for volunteers. Darryl Denton was put forward as a good candidate for Sample Tree and Air Mixer topic. Vance volunteered for Airflow testing with nozzles..
- vii. Research Ideas
- 1. Eliminating Cyclic Testing - Estimating Cd (Eric Berg)
 - Status: Still needs development. Should stay on list. Hung Pham-Copeland : Carrier did some work for AHRI

at one point not much was done with it. Will send link to Eric of DOE website with final report.

2. Oil Retention/Oil Return (Rite)

- Wrote up 1-pager. See attachment here. Mark Spatz still offered to help as did Hung Pham. Will forward 1-pager to both. Extend to general model using molecular weight, solubility, so that this does not have to be done every time a new refrigerant comes down the pipe. Add TC 3.1 as a co-sponsor.
- Steve Hancock suggested to make it a general model so that research would not have to be done for each new refrigerant/oil combo



Oil Retention and Oil
Return in a System w

3. Heating Linear Fit Model

- Status: There is a desire to pursue, but no one stepping up yet.. Simple model for heating mix matches. Already do this for cooling.
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4. Refrigerant charge modeling in system simulation

- Many studies (Purdue, Illinois, ...) have been done on methodologies to better account for charge in system modeling such that subcooling prediction can be more reliable but this continues to be an industry-wide unresolved issue. How do we formulate an RTAR here that will help move the ball ahead?
- Jon Douglas will try to write an RTAR. Will work on a 1-pager on this with others. Thought that there should be application based modeling not just single tube void fraction correlations.

viii. New Ideas

1. Email new ideas to Ray Rite

c. Handbook

Dutch Uselton

i. 2015 Applications – Chapter 1 Residences

1. The three reviewers on the subcommittee are: Van Baxter, Ray Rite and Amr Gado. Each has conducted a review on the chapter.
2. Received a College of Fellows review from Fred Garrett which focused upon whether the content was up-to-date and adequate. He also felt that more attention should be paid to duct design best practices.
3. Dutch Uselton asked if there was a chapter in the ASHRAE handbook that dealt with duct design. Reid Hart said that Chapter 21 of the ASHRAE Fundamentals handbook covers duct design but that it does not do a good comparison between rigid duct and flexible duct. Reid Hart suggested looking at some recent research to get more information. ACCA Manual D is already referenced in the chapter.
4. Dane Christensen requested to added as a reviewer.
5. Dutch Uselton advised the TC that the handbook chapter review form can be found on the ASHRAE website.
6. Dutch Uselton also requested help to find more interactive content for the “On-Line Plus” version of the handbook. Links to informative websites, recent research, etc.

7. Dutch asked that if anyone wants to help review the chapter, they can fill out the chapter review form and return it to him. The form is included below.



Handbook Chapter
Review Form.doc

- d. Standards Chris Stone
 - i. Chris Stone gave an update on recent activity on the standards relevant to TC 8.11. The full report is included below.



Std_Report_June25_
2012_TC811 reva.do

- e. Web site Darin Nutter
 - i. Reported that the ASHRAE logo on the website needs to be updated, but that the website is otherwise up to date.
 - ii. The chair thanked Darin for his many years of service in keeping the website up to date.

10. Old Business
 - a. None

11. New Business
 - a. None

12. Adjourn

- a. Darin Nutter moved to adjourn the meeting. The motion was seconded by Ray Rite. The meeting was adjourned at 6:15 p.m.