

# THE RESEARCH & TECHNICAL ACTIVITIES REPORT

**Michael R. Vaughn, P.E.**  
Manager  
Research and Technical Services

FOR TC/TG/SSPC CHAIRS, VICE CHAIRS &  
RESEARCH SUBCOMMITTEE CHAIRS  
July 16, 2010

## ASHRAE 2010 ANNUAL MEETING

The annual meetings of the Research Administration Committee (RAC), Technical Activities Committee (TAC), Technology Council, and the Board recently completed in Albuquerque, NM.

## PROJECTS AWARDED

The following six projects were approved for award as follows:

- **1493-RP**, “*CFD Shootout Contest*,” Responsible Committee: TC 5.2 (Duct Design); Co-Sponsor (s): TC 4.10 (Indoor Environmental Modeling); Contractor: Zhiqiang Zhai and the University of North Carolina-Charlotte ; Duration: 15 months; Cost to ASHRAE: \$20,000 each (\$40,000 total); Supports Research Strategic Goals: C6
- **1515-RP**, “*Thermal and Air Quality Acceptability in Buildings that Reduce Energy by Reducing Minimum Airflow from Overhead Diffusers*,” Responsible Committee: TC 2.1 (Physiology and Human Comfort); Co-Sponsor (s): (None); Contractor: University of California - Berkeley; Duration: 22 months; Cost to ASHRAE: \$174,714; Supports Research Strategic Goals: A5, A6
- **1517-RP**, “*Validation of a Low-Order Acoustic Model of Boilers and its Application for Diagnosing Combustion Driven Oscillations*,” Responsible Committee: TC 6.10 (Fuels and Combustion); Co-Sponsor (s): None; Contractor: Secat, Inc.; Duration: 18 months; Cost to ASHRAE: \$107,000; Supports Research Strategic Goals: C1
- **1547-RP**, “*CO<sub>2</sub>-based Demand Controlled Ventilation for Multiple Zone HVAC Systems*,” Responsible Committee: TC 4.3 (Ventilation Requirements and Infiltration); Co-Sponsor (s): none; Contractor: University of Nebraska - Lincoln; Duration: 18 months; Cost to ASHRAE: \$112,829; Supports Research Strategic Goals: A1, A2, A5. The principal investigator, Dr. Josephine Lau, is also a 2007-2008 ASHRAE Graduate Student Grant-in-Aid (GIA) recipient and the grant was sponsored by the Life Member Club.
- **1583-RP**, “*Assessment of Burning Velocity Test Methods*,” Responsible Committee: TC 3.1 (Refrigerants and Secondary Coolants); Co-Sponsor (s): None; Contractor: National Institute of Advanced Industrial Science Technology (AIST); Duration: 18 months; Cost to ASHRAE: \$80,000; Supports Research Strategic Goals: D2, D3. **Potential \$30k in Co-funding from AHRTI.**
- **1596-RP**, “*Ventilation and Indoor Air Quality in Retail Stores*,” Responsible Committee: 4.3 (Ventilation Requirements and Infiltration); Co-Sponsor (s): (None); Contractor: University of Texas - Austin ; Duration: 30 months; Cost to ASHRAE: \$1,408,356; Supports Research Strategic Goals: A5, A7, B2. Funding for the project and ASHRAE administrative costs associated with the project is provided through a \$1.5 million dollar grant from the NIST Measurement Science and Engineering Research Grants program.

The above information is now public knowledge, but no effort should be made by members of the responsible committee to contact the selected contractor until notified by MORTS that contract negotiations are complete and an agreement is in place.

## The Research & Technical Activities Report July 2010

### PROJECTS THAT FAILED TO BE FUNDED BY COMMITTEE VOTE

- **1611-URP**, “*On the Association of Low Indoor Humidity in Schools with Children Absenteeism*,” Responsible Committee: **TC 2.1** (Physiology and Human Comfort); Co-Reviewers: None. Status: TC 2.1 recommended that ASHRAE not fund this project.
- **1612-URP**, “*Environmental Analysis and Predicted Thermal Comfort in a Compressed Earth Block (CEB) Structure: Compliance to ASHRAE ET\* and Comparison with Conventional Built Structures*,” Responsible Committee: **RAC** (Research Administration Committee); Co-Reviewers: None. Status: RAC declined fund after review.
- **1617-URP**, “*Fan Noise Scaling and Statistics*,” Responsible Committee: **TC 5.1** (Fans); Co-Reviewers: None. Status: TC 5.1 recommended that ASHRAE not fund this project.
- **1620-URP**, “*Buoyant Plume Models for Displacement Ventilation*,” Responsible Committee: **TC 5.3** (Room Air Distribution); Co-Reviewers: None. Status: TC 5.3 recommended that ASHRAE not fund this project.
- **1622-URP**, “*Comparative Case Study of Energy Use Utilizing BIM for HVAC Design for Small Commercial Buildings*,” Responsible Committee: **RAC** (Research Administration Committee); Co-Reviewers: None. Status: RAC declined fund after review.

### PROJECTS PENDING AWARD

No proposals for tentative research projects (TRP) or unsolicited research proposals (URP) that were received prior to the Albuquerque meeting are pending a funding decision.

### POTENTIAL PROJECTS FOR BID IN FALL 2010

A small portion, if any, of the following twenty-two tentative research projects are expected to be released for bid this fall pending completion of all pre-bid conditions by the responsible committee in some cases, and acceptance of these conditions by their section Research Liaison prior to September 15, 2010. A much larger group of projects from this list is expected to be posted in early spring 2011 for bid.

- **1399-TRP**, “*Survey of Particle Production Rates from Process Activities in Pharmaceutical and Biological Cleanrooms*,” Responsible Committee: **TC 9.11** (Clean Spaces); Status: **RFP ready to bid now**.
- **1410-TRP**, “*Effect of System Chemicals toward the Breakdown of Lubricants and Refrigerants*,” Responsible Committee: **TC 3.2** (Refrigerant System Chemistry). Status: **RFP ready to bid now**.
- **1413-TRP**, “*Developing Standard Procedures for Filling Climatic Data-Gaps for Use in Building Performance Monitoring and Analysis*,” Responsible Committee: **TC 4.2** (Climatic Information); Status: **RFP ready to rebid now**.
- **1447-TRP**, “*Performance of Pressurized Stairwells with Open Doors*,” Responsible Committee: **TC 5.6** (Control of Fire and Smoke); Status: **RFP ready to bid now**.
- **1458-TRP**, “*Modeling Person-to-Person Contaminant Transport in a Mechanical Ventilation Space*,” Responsible Committee: **TC 4.10** (Indoor Environmental Modeling); Status: **RFP ready to bid now**.
- **1462-TRP**, “*Active Mechanisms for Enhancing Heat and Mass Transfer in Sorption Fluids*,” Responsible Committee: **TC 8.3** (Absorption and Heat Operated Machines); Status: **RFP ready to bid now**.

## The Research & Technical Activities Report July 2010

- **1495-TRP**, “*Effect of Lubricant on the Distribution of Water between the Vapor and Liquid Phases of Refrigerants;*” Responsible Committee: **TC 3.3** (Refrigerant Contaminant Control); Status: **RFP ready to bid now.**
- **1499-TRP**, “*The Effect of Humidity on the Reliability of ICT Equipment in Data Centers;*” Responsible Committee: **TC 9.9** (Mission Critical Facilities, Technology Spaces and Electronic Equipment); Status: **RFP ready to bid now.**
- **1502-TRP-R**, “*User Interface Design for Advanced System Operation,*” Responsible Committee: **TC 1.4** (Control Theory and Application); Status: **REBID.** Need Research Liaison OK of new recommended bidders list and possibly revised WS to assure bids are received for this final project solicitation.
- **1529-TRP**, “*Full-Frequency Numerical Modeling of Sound Transmission in and Radiation from Lined Ducts;*” Responsible Committee: **TC 2.6** (Sound and Vibration Control); Status: **RFP ready to bid now.**
- **1550-TRP**, “*Thermal Performance of Insulating Coating;*” Responsible Committee: **TC 1.8** (Mechanical System Insulation); Status: **RFP ready to bid now.**
- **1556-TRP**, “*Characterization of Liquid Refrigerant Flow Emerging from a Flooded Evaporator Tube Bundle;*” Responsible Committee: **TC 1.3** (Heat Transfer and Fluid Flow); Status: **RFP ready to bid now.**
- **1557-TRP**, “*Lab Comparison of Relative Performance of Gas Phase Filtration Media at High and Low Challenge Concentrations;*” Responsible Committee: **TC 2.3** (Gaseous Air Contaminants and Gas Contaminant Removal Equipment); Status: **RFP ready to bid now.**
- **1564-TRP**, “*Measurement of Oil Retention in the Microchannel Heat Exchanger;*” Responsible Committee: **TC 8.4** (Air to Refrigerant Heat Transfer Equipment); Status: **RFP ready to bid now.**
- **1565-TRP**, “*Development of the ASHRAE Design Guide for Dedicated Outdoor-Air Systems;*” Responsible Committee: **TC 8.10** (Mechanical Dehumidification Equipment and Heat Pipes); Status: **RFP ready to bid now.**
- **1580-TRP**, “*Study of Input Parameters for Risk Assessment of 2L Flammable Refrigerants in Residential Air Conditioning and Commercial Refrigeration Applications;*” Responsible Committee: **TC 3.1** (Refrigerants and Secondary Coolants). Status: **RFP ready to bid now.** **Potential \$87.5k in co-funding from AHRTI**
- **1581-TRP -C**, “*Develop Alternate Set-up Guidelines for Unitary Air Conditioner Test Configurations Which Cannot Adhere to ASHRAE 37 /ASHRAE 116 specified Duct Dimensions and External Pressure Tap Locations;*” Responsible Committee: **TC 8.11** (Unitary and Room Air Conditioners and Heat Pumps) ; Status: **Conditionally accepted for bid 10.06.** Work with Research Liaison to resolve RAC’s approval conditions by September 15th so project can possibly bid this fall 2010. **Potential \$10k in co-funding from AHRTI**
- **1584-TRP**, “*Assessment of Alternative Approaches to Predicting the Burning Velocity of a Refrigerant;*” Responsible Committee: **TC 3.1** (Refrigerants and Secondary Coolants). Status: **RFP ready to bid now.** **Potential \$15k in co-funding from AHRTI**
- **1592-TRP-C**, “*CHP Design Guide – Update to the Cogeneration Design Guide (1996);*” Responsible Committee: **TC 1.10** (Cogeneration Systems); Status: **Conditionally accepted for bid 10.06.** Work with Research Liaison to resolve RAC’s approval conditions by September 15th so project can possibly bid this fall 2010.

## The Research & Technical Activities Report July 2010

- **1603-TRP**, “*Role of HVAC Systems in the Transmission of Infectious Agents in Buildings and Intermodal Transportation;*” Responsible Committee: TC 9.3 (Transportation Air Conditioning); Status: RFP ready to bid now.
- **1606-TRP**, “*Laboratory Testing of Flat Oval Transitions to Determine Loss Coefficients;*” Responsible Committee: TC 5.2 (Duct Design); Status: RFP ready to bid now.
- **1613-TRP-C**, “*Update Climatic Design Data in Chapter 14 of the 2013 Handbook of Fundamentals;*” Responsible Committee: TC 4.2 (Climatic Information); Status: Conditionally accepted for bid 10.03. Work with Research Liaison to resolve RAC’s approval conditions by September 15th so project can possibly bid this fall 2010.

**Revised work statements for the projects listed above, which have been approved by your section Research Liaison as satisfying all pre-bid conditions, if any, must be submitted to the MORTS on or before September 15th in order to be eligible and ready to bid in fall 2010.**

### WORK STATEMENTS REVIEWED AND RETURNED WITH COMMENTS

A total of eight work statements were submitted by the TCs for review at the annual meeting. Two were conditionally approved, and the following work statements were returned with comments:

- **1434-WS**, “*Refrigerated Facilities Doorway Infiltration Air Energy Reduction;*” Responsible Committee: TC 10.5 (Refrigerated Distribution and Storage Facilities); Co-Sponsors: TC 10.8 (Refrigeration Load Calculations); Status: Returned with comments. Work with Research Liaison to resolve RAC’s comments before resubmitting.
- **1561-WS**, “*Procedures to Adjust Observed Climatic Data for Regional or Microclimatic Variations;*” Responsible Committee: TC 4.2 (Climatic Information); Co-Sponsors: none; Status: Returned with comments. Work with Research Liaison to resolve RAC’s comments before resubmitting.
- **1566-WS**, “*Equations to Estimate Evaporation Rates from Wetted Surfaces in Natatoriums, Commercial and Institutional Building and Meat Processing Plants;*” Responsible Committee: TC 8.10 (Mechanical Dehumidification Equipment and Heat Pipes); Co-Sponsors: TC 1.12 (Moisture management in Buildings) and TC 8.12 (Desiccant Dehumidification Equipment and Components) ; Status: Returned with comments. Work with Research Liaison to resolve RAC’s comments before resubmitting.
- **1587-WS**, “*Improved Tools for Control Loop Performance Measurement and Evaluation;*” Responsible Committee: TC 7.9 (Building Commissioning); Co-Sponsors: TC 1.4 (Control Theory and Application); Status: Returned with comments. Work with Research Liaison to resolve RAC’s comments before resubmitting.
- **1588-WS**, “*Representative Layer-by-Layer Descriptions for Fenestrations Systems with Specified Bulk Properties Such as U-Factor and SHGC;*” Responsible Committee: TC 4.7 (Energy Calculations); Co-Sponsors: TC 4.5 (Fenestration); Status: Returned with comments. Work with Research Liaison to resolve RAC’s comments before resubmitting.
- **1608-WS**, “*Comprehensive Performance Rating (CPR) for Light Commercial Unitary HVAC, Phase 1;*” Responsible Committee: TC 8.11 (Unitary and Room Air Conditioners and Heat Pumps); Co-Sponsors: TC 7.6 (Building Energy Performance); Status: Returned with comments. Work with Research Liaison to resolve RAC’s comments before resubmitting. **Possible AHRTI co-funding for project**

**A revised work statements for the project listed above, which has been approved by your section Research Liaison for resubmission, can be submitted to the MORTS on or before August 15 in order**

## The Research & Technical Activities Report July 2010

**to be reconsidered at RAC's fall meeting. If it can't be revised that quickly, the next deadline for RAC consideration of this and other work statements is December 15, 2010.**

### **WORK STATEMENTS PREVIOUSLY RETURNED TO TCs**

TC/TGs should work with their Research Liaison to respond to written comments on the work statement provided by RAC via letter and revise the work statement appropriately. You can find a copy of the last draft submitted to RAC along with RAC's comments by clicking on the links in the Society's Research Implementation Plan posted on the "Research" page of the ASHRAE website or contact Donna Daniel (ddaniel@ashrae.org), Research Coordinator, for a copy.. Please note that topics will be dropped from this plan if the work statement is not approved for bid after four years on the plan. The work statement forms that are now in use by RAC for Society year 2010-2011 can also be found on the "Research" page [www.ashrae.org/research](http://www.ashrae.org/research)

New or revised work statements and RTARs with TC/TG/SSPC votes need to be received by the Manager of Research and Technical Services (MORTS), Mike Vaughn, [morts@ashrae.net](mailto:morts@ashrae.net), no later than **August 15, 2010** in order to be considered by RAC at its fall meeting in late September/October or by **December 15, 2010** to be considered at their winter meeting in Las Vegas.

### **REVIEW OF RESEARCH TOPIC ACCEPTANCE REQUESTS (RTARS)**

RAC reviewed six RTARs at their annual meeting and approved the following two for inclusion in the Society's Research Implementation Plan and for further development into work statements:

- **1615-RTAR**, "*Fault Detection and Diagnostic (FDD) Methods for Supermarkets;*" Responsible Committee: **TC 7.5** (Smart Building Systems); Co-Sponsors: TC 10.7 (Commercial Food and Beverage Cooling Display and Storage); Status: **Accepted**
- **1618-RTAR**, "*Literature Search and Risk Assessment for Establishing a Low Limit of Relative Humidity Levels in Health Care Spaces ;*" Responsible Committee: **TC 9.6** (Healthcare Facilities); Co-Sponsors: none; Status: **Conditionally accepted** - Work with RL to clear conditions before starting on work statement

### RTARs Returned or Rejected with Comments:

- **1614-RTAR**, "*Evaluation of Effectiveness of UV Systems;*" Responsible Committee: **TC 5.10** (Kitchen Ventilation); Co-Sponsors: none; Status: **Returned**
- **1616-RTAR**, "*Revise Load Calculation Application Manual;*" Responsible Committee: **TC 4.1** (Load Calculation Data and Procedures); Co-Sponsors: none; Status: **Returned**
- **1619-RTAR**, "*Data Center Gaseous Contamination Limits and Means of Monitoring;*" Responsible Committee: **TC 9.9** (Mission Critical Facilities, technology Spaces and Electronic Equipment); Co-Sponsors: none; Status: **Returned**
- **1621-RTAR**, "*Driving Rain: Impact on Durability, Indoor Humidity and Energy Efficiency;*" Responsible Committee: **TC 4.4** (Building Materials and Building Envelope Performance); Co-Sponsors: none; Status: **Rejected**

The RTAR form that is now in use by RAC for Society year 2010-2011 can be found on the "Research" page of the ASHRAE website, [www.ashrae.org/research](http://www.ashrae.org/research)

New or revised RTARs with TC/TG/SSPC votes need to be received by the Manager of Research and Technical Services (MORTS), Mike Vaughn, [morts@ashrae.net](mailto:morts@ashrae.net), no later than **August 15, 2010** in order to be considered by RAC at its fall meeting in October or by **December 15, 2010** to be considered at their winter meeting in Las Vegas.

## The Research & Technical Activities Report July 2010

### **SOCIETY RESEARCH IMPLEMENTATION PLAN**

The Society Research Implementation Plan is now being updated following the annual meeting of RAC. New RTARs will be added and tentative research project RFPs will be added or dropped depending on their bid status. This change to the way the implementation plan is updated necessitated that time limits be placed on how long a topic can remain on the plan without being approved for bid. The summer updates to the plan should be in place by August 1, 2010. Please review the latest draft of the Implementation plan posted on the ASHRAE "Research" page to see if any topics your TC is sponsoring are in danger of being dropped from the plan.

### **DEADLINES**

The following deadlines apply for the next several months. Please recognize that they are not arbitrarily set, but are set to meet subsequent events. So if you miss them, action on your input may be delayed for six months or in some cases, for a year. All submissions should be sent to the Manager of Research and Technical Services (MORTS), Mike Vaughn, (morts@ashrae.net).

- |                           |   |
|---------------------------|---|
| <b>August 6, 2010</b>     | Deadline for program proposals (seminars and forums) and conference paper drafts to be submitted for the 2011 winter meeting in Las Vegas, NV. The meeting theme is "Zero Energy Design." <a href="http://www.ashrae.org/lasvegas">http://www.ashrae.org/lasvegas</a>               |
| <b>August 15, 2010</b>    | New or revised Work Statements and RTARs are due to MORTS for RAC consideration at the 2010 fall RAC meeting.   |
| <b>August 30, 2010</b>    | TC/TG/TRG meeting minutes from the Albuquerque meeting are posted on TC website and distributed to membership.  |
| <b>September 1, 2010</b>  | Nominations for the 2010-2011 George B. Hightower Technical Achievement Award for TC volunteer efforts over the past four years in areas except research and standards are due to TAC section heads.  |
| <b>September 15, 2010</b> | Conditionally approved tentative research projects that are approved for bid or re-bids must have all conditions satisfied with section Research Liaison and be in the hands of the MORTS by this date or sooner if they are to be eligible for possible bid in the fall 2010.      |
| <b>September 17, 2010</b> | Transaction papers and Conference paper abstracts are due for the 2011 Annual Meeting in Montreal Canada. The theme for this meeting is "Net-Zero Buildings." <a href="http://www.ashrae.org/montreal">www.ashrae.org/montreal</a>  |
| <b>September 30, 2010</b> | Nominations for the 2010-2011 Service to ASHRAE Research Award for TC volunteer efforts in research are due to RAC research liaison.  |
| <b>October 15, 2010</b>   | Fall 2010 tentative research projects (TRPs) are released for bid.  |
| <b>November 12, 2010</b>  | Completed TC/TG/TRG Meeting room request form for 2010 Winter meeting due to Judy Marshall ( <a href="mailto:jmarshall@ashrae.org">jmarshall@ashrae.org</a> ) at ASHRAE HQ. <u>Subcommittee meeting rooms must be requested each meeting or they will be dropped automatically.</u> |
| <b>November 30, 2010</b>  | TC/TG/TRG Chairs receive 2011-12 roster update workbook for completion.   |
| <b>December 1, 2010</b>   | Applications for the ASHRAE New Investigator Award are due to MORTS.  |
| <b>December 15, 2010</b>  | Applications for ASHRAE Graduate Student Grant in Aid program are due to MORTS.   |

## The Research & Technical Activities Report July 2010

- December 15, 2010** Nominations for the ASHRAE Homer Addams Award, which is given to graduate students assisting in current or recently completed ASHRAE sponsored research projects, are due to MORTS.
- December 15, 2010** Bids are due for all TRPs released in fall 2010.
- December 15, 2010** New or revised Work Statements and RTARs are due to MORTS for RAC consideration at the 2011 winter meeting.
- December 29, 2010** TC/TG/TRG meeting agenda for the Las Vegas meeting are posted on TC website and distributed to membership.
- February 1, 2011  
Midnight** Roster update workbooks for 2011-2012 TC/TG/TRG rosters are due to section head
- February 1, 2011  
Midnight** Contractor recommendations are due to MORTS for all TRPs bid in fall 2010 or before. Place the Proposal Evaluation Summary sheet in MORTS lockbox outside ASHRAE Headquarters Room in Las Vegas.

### OTHER INFORMATION

**1. TC "Help Wanted" Section to be added to ASHRAE website**

A new "Help Wanted" section will be added to the Technical Committee page of the ASHRAE website so that TCs can advertise requests for help. Requests could include calls for new members, a webmaster, reviewers and contributors for a handbook chapter or special publication, special expertise that resides outside the TC, equipment donors for a research project, etc. Requests should be for needs that need to be fulfilled within the next 6-12 months. Chapter Technology Transfer Committee (CTTC) will assist in this effort by making sure ASHRAE chapters are aware of this request list. Please pass on any requests for your TC to the Manager of Research and Technical Services, Mike Vaughn, at [mvaughn@ashrae.org](mailto:mvaughn@ashrae.org) or [MORTS@ashrae.net](mailto:MORTS@ashrae.net)

**2. 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](mailto:mvaughn@ashrae.org) or [MORTS@ashrae.net](mailto:MORTS@ashrae.net)

**3. Update on Development of Research Strategic Plan for 2010-2015 period**

The final draft of the Research Strategic Plan for 2010-2015 is now available at <http://www.ashrae.org/technology/page/39>

**4. 10-11 Rosters & Process for Distribution**

The new TC/TG/TRG rosters for 2010-2011 are now in effect. Each TC chair should have already received a copy of their roster from their section head in PDF and MS-Excel format. In addition, each member can view all of their current (10-11) committee rosters on the ASHRAE Website. Go to [www.ashrae.org](http://www.ashrae.org), click on the "Membership" tab in the header, click on "Manage Your Membership" text in the left sidebar, and log in (if you have not logged in lately, you might need to set up a new username and password). Click on the "Biographical Record System" link. Now, you should see your current "bio info". Click on "My Committees" on the left sidebar; all of the committees you are a member of will appear. Click on the "blue" roster text at the left hand side of a committee to reveal the roster with linked contact information. Please distribute the roster files to your committee and make sure everyone on your committee also knows how to access the roster online for the latest version throughout the year.

## The Research & Technical Activities Report July 2010

### **5. Useful TC/TG/TRG Chair Information and forms on ASHRAE website**

Information for TC/TG/TRG chairs can be found on the Technical Committee page of the ASHRAE website at the following link: <http://www.ashrae.org/technology/page/104>..

Please let me know if I can be of any other assistance.

Sincerely,  
Mike Vaughn  
Manager, Research and Technical Services  
ASHRAE