(Minutes of all Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

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<tr>
<th>TC/TG/MTG/TRG No.</th>
<th>DATE</th>
<th>TC/TG/MTG/TRG TITLE</th>
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<td>8.5</td>
<td>07/09/2015</td>
<td>Liquid-to-Refrigerant Heat Exchangers</td>
<td>06/27/2015</td>
<td>Atlanta, GA</td>
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<th>MEMBERS</th>
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<td>Satyam Bendapudi</td>
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<td>Ebrahim S. Al Hajri</td>
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<td>Justin P. Kauffman</td>
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<th>Role</th>
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<tr>
<td>TAC Section Head:</td>
<td>Stephen W Duda</td>
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<td>TAC Chair:</td>
<td>William F McQuade</td>
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<td>All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters:</td>
<td>Patrick C Marks, David A Yashar, James Dale Aswegan, Michael R Vaughn</td>
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<tr>
<td>Manager Of Standards</td>
<td>Stephanie Reiniche</td>
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<tr>
<td>Manager Of Research &amp; Technical Services</td>
<td>Mike Vaughn</td>
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ASHRAE TC 8.5 Liquid – Refrigerant Heat Exchangers
Annual Meeting, 27 June 2015 (Atlanta, GA)

These draft minutes have been approved by this committee.

1. **Call to order and reading of TC 8.5 scope (S. Bendapudi)**
   TC 8.5 Vice Chair, S. Bendapudi, ran this meeting since Chair, E. Al-Hajri, could not attend the meeting.
   The meeting was called to order at 4:16pm. S. Bendapudi introduced the title, purpose and scope of TC 8.5.

2. **Establish quorum requirements (Y. Zou)**
   7 of 12 (incl. non-quorum) voting members were present at quorum call; quorum was established.

   Members present: S. Bendapudi, K. Oza, J. Kauffman, S. Perencevic, L. Cremaschi, A. Knoepfler, J. Shafer
   Members absent: E. Al-Hajri, Z. Ayub, B. Dingel, E. Gorgy, S. Yana-Motta

3. **Review/approve minutes from previous meeting (Y. Zou)**
   Meeting minutes of TC 8.5 in ASHRAE Winter Conference in Chicago was distributed and reviewed for approval. S. Perencevic took the motion. J. Kauffman seconded. The minutes were passed with 6 in favor and 1 abstained (6-0-1). L. Cremaschi abstained because he didn’t attend the meeting in Chicago.

4. **Section Head comments (S. Duda)**
   TAC 8 Section Head attended this meeting. He clarified that this meeting still used the old roster, while the new roster had send to TC 8.5 and would be effective after 7/1/2015.

   S. Duda announced there would be a new website template for the TC website. Old information in the website would be transferred automatically. The website would look more modern and user-friendly for the webmaster to edit. A few TCs had been beta testing the website. Interested member could check it out, i.e. TC 9.1 website was one example.

   S. Duda announced S. Bendapudi should email the activity report of this meeting to S. Duda be the end of 6/30/2015. It has been done.

   S. Duda announced that ASHRAE emphasized TC to welcome the guests in the TC meeting. RAC recommended TC to designate a person to follow up with guests, get the feedbacks, and encourage the guests to become corresponding member.

   S. Duda announced that one TC of each section was awarded each year. The best TC award was based on that minutes was submitted on time, website was updated, handbook chapters were turned in on time, and meaningful business of TC was on the way, etc.

   S. Duda announced that he would roll off this year. He appreciated the work of TC 8.5 for the past 4 years. New Section Head would be Dustin Meredith. S. Duda would help during this transition.

5. **Liaison Comments**
   Handbook Liaison P. Marks attended the meeting. He acknowledged the work of TC 8.5. Chapter 42 was already voted.
6. **Chairman’s report/comments (S. Bendapudi)**
   
   S. Bendapudi summarized Chair breakfast report. In addition to TC Chair, other officers including Vice Chair, Secretary, Subcommittee Chair would also have alias emails. This would be effective for communication rather than personal emails.

   ASHRAE would send the thank you letter to the attendee’s employer for allowing them to attend the conference. Please contact S. Bendapudi for the thank you letter. S. Bendapudi announced the deadline of award nominations was 9/1/2015.

   J. Kauffman would nominate Ken Schultz for ASHRAE Service Award. J. Kauffman was waiting for ASHRAE staff to calculate the points. If other members could help on counting ASHRAE points, please contact J. Kauffman.

   S. Bendapudi announced that ASHRAE required the member to update his profile on the next level of discipline. This information was required when the membership was renewed.

   S. Bendapudi announced that he would email the 2015-2016 roster.

   S. Bendapudi announced that CTTC encouraged the member to advertise TC work to get people more familiar with the TC when the member attended local chapter events.

7. **Membership subcommittee report (K. Oza)**
   
   K. Oza summarized the membership activities. There were 12 voting members, 7 were here. L. Cremaschi and S. Yana-Motta would roll out, while S. Padhmanabhan, S. Eckels and J. Thome would roll in after this meeting.

   There were currently 68 members in TC 8.5. K. Oza would contact the people that usually didn’t come to check if they were still interested in TC 8.5. For other people that are interested TC 8.5, please contact K. Oza to become corresponding member.

8. **Handbook subcommittee report (S. Padhmanabhan)**
   
   S. Padhmanabhan summarized the Handbook Chair meeting report. TC 8.5 was in a good shape on Handbook. Chapter 39 was finished, submitted and approved. Chapter 42 needed small changes such reference. J. Kaufffman moved the motion to approve the change. K. Oza seconded. It was passed with all in favor (7-0-0).

   S. Padhmanabhan stated that the handbook should be improved to be more use-friendly and have more examples. Inputs from members on terminology and ASHRAE research results should be included in the handbook. J. Kauffman suggested to take a small portion of the handbook in each cycle and improve it. Next time, improved the next portion. J. Kauffman also suggested that the new examples might not be necessary to go to the printed handbook, could be just in the online version handbook. The videos and pictures would be some examples to go the online version handbook.

9. **Program subcommittee report (S. Eckels)**
   
   S. Kulankara summarized that no program of TC 8.5 was presented in 2015 Atlanta Annual Meeting.

   A. Koepfler stated that TC 8.5 submitted the seminar with 3 presentations but it was not approved. TC 8.5 would submitted the same seminar to the 2016 Orlando Winter Meeting. S. Duda suggested to contact the track chair before submitting the seminar. This would increase the possibility to approve.
S. Bendapudi summarized the CEC report. In 2016, CEC would introduce a new invited speaker policy. The topic would be useful for ASHRAE. The speaker would be expert on the subject. The speaker must not be an ASHRAE member. The conference registration fee would be waived.

CEC was seeking track ideas for the 2017 Las Vegas Winter Meeting. Reviewers of the papers were also needed for the conference.

10. Standards subcommittee report (J. Huber)
J. Huber reported the status of standards. The following standards are relevant to TC 8.5.

Standard 24 – “Methods of Testing for Rating Liquid Coolers”

No action was required on any of the standard. Standard 22 and 181P were just re-written. Standard 24 would experience the same changes of Standard 22 and 181P when the cycle came up. For Standard 181P, only PDF version was available. The paper copy of Standard 181P was not available yet. J. Huber will check if anything went wrong.

11. Journal/Insights/Webmaster report (J. Huber)
J. Huber reported that everything is up to date for the website. J. Huber would look into the new version of the website.

12. MTG Liaison (J. Kauffman)
J. Kauffman introduced the MTG of Low GWP Alternative Refrigerants. The MTG will support the submission of relevant papers to the track of low GWP refrigerant for the 2016 St. Louis Annual Meeting.

A new MTG O&MEE was established. The MTG was looking more TCs to join. Volunteers were needed to represent TC 8.5 in this MTG. Interested person please contact S. Bendapudi. It was expected the MTG met 4 times per year through both telecom and onsite meeting.

13. Research subcommittee report (J. Piggush)
J. Piggush couldn’t attend this meeting. J. Huber summarized the research chair breakfast report to TC 8.5. The report included 3 parts:

1) ASHRAE might change the stage funding and project monitoring. The main change was that a milestone chart and cost was required to be included in the proposals, work statement and evaluation. The payment would be done according to the milestone. PMS would need to approve the milestones. Any scope change by the PMS or PI after the project was granted must be voted officially by the TC. If there was budget change, it would need to be voted by RAC. TC 8.5 had a discussion on this. J. Huber addressed L. Cremaschi’s question that this change was not set. S. Bendapudi asked the value of each milestone. J. Huber responded that it was up to the people to write the proposal and bidder were free to write their milestones. L. Cremaschi expressed that this would be too time-consuming for both PMS and PI. Following the discussion, TC 8.5 thought this change should push to the high value projects while the low value projects should stay the same. Also, TC 8.5 had good PMS to monitor the projects. TC 8.5 didn’t experience any issues on the project. J. Huber would pass these comments of TC 8.5.
3) The strategic plan ASHRAE would be changed. ASHRAE would emphasize on the residential system. Research projects on the residential system would be more likely to be approved. Also, ASHRAE would like to show the value to consulting companies. ASHRAE emphasized the project that could be put in the handbook, so more people could see it. ASHRAE would provide the training for RTAR writing. It was expected to be done by June 2016 and be presented in a conference.

B. Dingel couldn’t attend the meeting, but emailed the summary of RP-1677 as below.

“The work in this project over the last several months has focused on some modifications to the laboratory setup to try and obtain better baseline heat transfer data for condensation of a 3 tube condenser “bundle” as well as acquiring parts and constructing additional loops (3 total heat pump/condenser loops) needed for the data collection phase of the project. There are still some questions about the initial data; Improvements have been made, but results are not consistent with the expected performance of the tubes being used for test loop setup and evaluation. Additional data will be presented to the PMS in upcoming months. Current plans are to begin fouling data collection in September. The investigators are not able to attend the Summer meeting, but I expect a PMS/Investigator conference call in the August time frame.”

A. Jacobi also gave a brief summary on RP-1677: there would be a telecom conference in August to discuss the initial data and project plan, etc.

14. New Business
   No new business were discussed.

15. Schedule Next meeting: Monday Jan 23-27 in Orlando, FL, 4:15 PM to 6:30 PM
   S. Bendapudi announced the time for next meeting.

16. Adjourn
   S. Bendapudi moved the motion to adjourn. A. Knoepfler seconded. The meeting adjourned at 5:36pm with a unanimous vote.
Appendix A
Chair’s Breakfast Report
S. Bendapudi
Final
AGENDA
SECTION TC/TG/TRG CHAIR’S BREAKFAST MEETING
2015 Annual Meeting
Atlanta, GA

Sunday, June 28
6:30 A.M. – 8:00 A.M. EST
Atlanta Hilton Hotel (Downtown)

Section 1  201 Room - 2nd Floor
Section 2  214 Room – 2nd Floor
Section 3  405 Room – 4th Floor
Section 4  311 Room – 3rd Floor
Section 5  303 Room – 3rd Floor
Section 6  402 Room – 4th Floor
Section 7  307 Room – 3rd Floor
Section 8  404 Room – 4th Floor
Section 9  203 Room – 2nd Floor
Section 10  211 Room – 2nd Floor

I. CALL TO ORDER

II. ROLL CALL AND INTRODUCTIONS (5 minutes)


IV. ADDITIONS AND/OR CHANGES TO THE AGENDA (5 minutes)

V. REVIEW MINUTES/NOTES, SPECIAL ASSIGNMENTS, ACTION ITEMS FROM LAST MEETING, AND NEW ISSUES (30 minutes).
New TC Assignments or TC Feedback Sought:
   A. Discuss and affirm TGs, and TRGs in section that will continue in 2015-2016 Society Year
   B. What is your TC/TG doing now or planning to do near term that could impact or benefit the residential sector to some degree?
   C. Do we need a new mandatory TC leadership position focused on membership to attract and mentor new and potential TC members?
   D. TAC sees a need to form a new MTG on the general topic of occupant behavior in buildings and its impact on building energy use and IEQ factors
and is now seeking interested TCs and individuals to help develop a formal MTG proposal (Sections 2 & 7 are closely related to this topic). E. To be determined

VI. IDENTIFY SHARED OPPORTUNITIES AND CHALLENGES FOR SECTION (10 minutes).
Society’s Strategic Plan? Research Strategic Plan? Handbook workshop recommendations?, etc.

VII. REVIEW SECTION MBOs (10 minutes).
Discuss section and TC MBOs for this year and coming year and how the section can work together to address them or establish section and TC MBOs if not already done.

VIII. DISTRIBUTED WRITTEN INFORMATION AND REQUESTS FROM SOCIETY LIAISONS TO TC/TG/TRG CHAIRS (30 minutes).
Additional Announcements/Reminders:

A. NEW!
1. Provisional Corresponding Member (PCM) Process
2. New Easier to Use Standard Website Template in Development
3. Coming Soon! - New TC E-mail Position Aliases for 15-16 Society Year
4. RAC Prioritizing Research Topics Related to the Residential Sector

B. AT THIS MEETING
1. On-Site Training
2. RAC Forum #3 – Is the ASHRAE Research Process Efficient?
3. Location of Section Head Mailboxes at this Society meeting & Free Wi-Fi Access at this Society meeting.
4. Retiring TC/TG/TRG Chair Certificates
5. E&P Beta Test #8 TC meetings being Held in Atlanta

C. UPCOMING DEADLINES
1. Thank You Letters to Employers
2. 2015-2016 Hightower Award Nomination Process and Deadline
3. 2015-2016 Service to ASHRAE Research Award Nomination Process and Deadline
4. Seminar and Forum proposal for Orlando are due by Monday, August 10, 2015.
5. CEC requests Program Track suggestions

D. REMINDERS
1. Employment Discipline added to ASHRAE BIO Online Input Form
2. TC Volunteers willing to Support Content Development and Quality Control for Society Technical Program at Society Meetings
3. Option for TC Subcommittee Meetings via Conference Calls and Web Meetings
4. Report on TC/TG/TRG websites in Section (SHs need to report to TCs which sites are not up to date.)
5. Special effort to welcome new members, and visitors (potential members), particularly international members, to TC meetings
6. 15-16 Rosters Access & Distribution
7. Useful TC/TG/TRG/MTG Chair Information and forms on ASHRAE website
8. Request for each technical committee to briefly review ASHRAE Code of Ethics at start of TC meeting

E. RECENT ANNOUNCEMENTS
1. Outstanding TC Award
2. Recent MTGs that have been formed
3. Standard 203-2014 now available for use and reference
4. Recent updates to the TC MOP (Manual of Procedures)
5. TC Activity Form
6. TAC Presentation template for TC members to use with local Chapter
7. TC Master Calendar – Now Available through Google

F. UPCOMING ASHRAE CONFERENCES
1. Program Focus at Atlanta Annual Conference
4. Recent updates to the TC MOP (Manual of Procedures)
5. TC Activity Form
6. TAC Presentation template for TC members to use with local Chapter
G. UPCOMING WORKSHOPS AND CONFERENCES

1. 2015
2. 2016

IX. REMARKS FROM SOCIETY LIAISONS TO TC/TG/TRG CHAIRS
Liaison members from Research Administration, ASHRAE Program, Handbook, Standards, and other standing committees will have an opportunity to describe their committee activities that relate to the TC/TG/TRG functions, if time permits. Written announcements must be provided as a minimum by liaisons in order to have an opportunity to speak at this meeting.

ADJOURN
Announcements and Reminders for TC/TG/TRG & MTG Chairs
ATLANTA 2015

A. NEW!

1. PCM Process - The process for adding new PCMs to TC rosters and notifying all affected parties has now been automated through the ASHRAE website. Potential new TC members now just need to click on the JOIN A TC button at the top of the TC page (www.ashrae.org/tcs) on the ASHRAE website to get started.

2. New Easier to Use Standard Website Template in Development - We are working with the Society’s Electronic Communication Committee (ECC), staff, and a consultant to modernize and streamline the template for TC websites. This will include WIZYWIG editing, automatic rosters and simplified document uploading. There will be no more HTML editing. We have a preliminary design and will be working with several volunteer beta testers from various TCs to finalize the design and operation. Anticipate release sometime in the fall of 2015.

3. Coming Soon! - New TC E-mail Position Aliases for 15-16 Society Year - We are in the process of creating new position e-mail alias addresses for each of the remaining mandatory positions of the Technical Committee management team (Secretary, Standards Sub. Chair, Program Sub. Chair, Handbook Sub. Chair, and Webmaster). The process will take 4-6 weeks. In the meantime, we ask that you review your membership profile to ensure that your email address is up-to-date. Your profile can be accessed by logging onto the “Member’s Only” section at www.ashrae.org. The 15-16 E-mail Alias list will then be distributed to the TCs once this work is complete.

4. RAC Prioritizing Research Topics Related to the Residential Sector
Starting in the 2015-2016, RAC will be prioritizing for bid accepted research topics that support Goal #3 below from the Research Strategic Plan.

Goal #3: To reduce significantly the energy consumption for HVAC&R, water heating and lighting in existing homes.

B. AT THIS MEETING

1. On-Site Training
i. TC/TG/TRG Chair's Training Workshop Reminder - Sunday June 28, 9:45-10:45 AM in Salon C Room (2nd floor) in the Atlanta Hilton Hotel. This session will be a repeat of the same content that was presented in a 6/12 via a webinar for individuals that could not make this webinar. As with the Breakfast meeting, both the Chair and Vice-Chair are expected to attend if they did not attend the webinar; attendance will be tracked so that we can assess who has been trained. Bring questions - if you need an answer, it's quite likely others also need the same answer. We are also interested in hearing your feedback if you attended the webinar also. The main focus of this particular workshop will be on ASHRAE Tools for TCs.

ii. RAC’s Research Subcommittee Chair’s Breakfast – Monday, 6/29, 6:30 AM Please encourage your Research Subcommittee Chair or another representative from the TC to attend this meeting so that your RAC Research Liaison (RL) can get an update on the TC’s research activities and so that your RL can help resolve issues & questions that TC may have concerning their research program. The training portion of this meeting will focus on the duties and responsibilities of Project Monitoring Subcommittee (PMSC) Chair. After the meeting, RAC plans to record this training presentation and post to the ASHRAE website as a new training webinar that current and new PMSC chairs can access at any time.

iii. TC Program Subcommittee Chair Training in Atlanta - Tuesday, 6/30, 11:15AM – Noon, Room 315, (3rd Floor) Atlanta Hilton Hotel. Don’t complain about the meeting program and your TC’s submissions if you have not been to training.

A few things you might learn in training are as follows:

- Incomplete program submissions is the biggest reason for rejection now. All information is needed up front for CEC selection process.
- A packaged session on a similar topic is the best way to greatly improve your chances for acceptance.
- There is no difference in how CEC handles 60 and 90 minute program slots. 60 minute slots are just as good as 90 minute slots if complete.

2. RAC Forum #3 – Is the ASHRAE Research Process Efficient?
Do you have a good idea for how the ASHRAE Research Program and its current processes could be improved? If so, members of the ASHRAE Research Administration Committee (RAC) would very much like to talk to you more about your idea in Atlanta at the forum below.

Monday, June 29
11:00 A.M. to 12:00 PM
Forum 3 – Is the ASHRAE Research Process Efficient
206/207 Room – 2nd Floor – Atlanta Hilton Hotel

3. Location of Section Head Mailboxes at this Society meeting & Free Wi-Fi Access at this Society meeting - Mailboxes are located just outside ASHRAE Headquarters Office (208/209 – 2nd Floor – Atlanta Hilton Hotel).

Also, Internet access and computers for e-mail are available in the Cyber Café located in the registration area during operating hours. Please be considerate to others and limit your usage to five minutes.

Internet is also available complimentary in your sleeping room in the Hilton.

Wireless internet will be available in all meeting rooms at the Hilton. ASHRAE will be working with the internet provider to manage the bandwidth so that member expectations of accessibility and speed are fulfilled. We would like to request that everyone limit their usage to functions that do not use excessive bandwidth. Applications such as Facebook, YouTube, streaming video, etc. use excessive bandwidth. Access code is ASHRAE2015 and the code is case sensitive.

4. Retiring TC/TG/TRG Chair Certificates - TC chairs that are completing their terms as chair at this Society meeting will be presented with a certificate of appreciation. Please coordinate with your Section Head as to when and where at the meeting you would like to be presented with the certificate (Section meeting or TC meeting)

5. E&P Beta Test #8 TC meetings being Held in Atlanta - The 8th beta test of Electronic and Present (E&P) meetings, which allows some TC members to participate in the TC meeting from a remote location electronically, will occur in Atlanta and the following ten TCs have agreed to participate in this test: TC 1.5, TC 2.2, TC 4.2 (RP1561 & RP-1699 PMSC), TC 5.8, TC 6.8, TC 7.9, TC 8.4, TC 8.8, TC 9.2, TC
10.2 The chairs of those TCs participating should provide to their Section Head feedback on their E&P meeting experience before TAC meets on Wednesday morning, 7/1.

C. UPCOMING DEADLINES

1. Thank You Letters to Employers - ASHRAE President – Thomas Phoenix – 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 2014-2015. 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.

Please let your committee members know that they will be receiving an email about employer thank you letters in early July with details on how to request a thank you letter.

2. 2015-2016 Hightower Award Nomination Process and Deadline - Nominations for the 2015-2016 George B. Hightower Technical Achievement Award are due to you Section Head by September 1, 2015. The award recognizes outstanding technical leadership and contributions on a TC/TG/TRG during the past four years, excluding research and standards activities. Please go to the Technical Committee page of the ASHRAE website at the following link under the “Procedures, Forms…” heading: http://www.ashrae.org/tcs

3. 2015-2016 Service to ASHRAE Research Award Nomination Process and Deadline - Nominations for the 2015-2016 Service to ASHRAE Research Award for TC volunteer efforts in research are due to RAC research liaison by September 1, 2015 (new date). Please go to the Research page of the ASHRAE website at the following link under the “Research Grants and Awards” heading: http://www.ashrae.org/research

4. Seminar and Forum proposals for Orlando are due by Monday, August 10, 2015.
Please visit the following site to submit your proposal: http://ashraem.confex.com/ashraem/w16/cfp.cgi

For more information, go to: www.ashrae.org/orlando.
5. **CEC requests for Program Tracks** - The Conferences and Expositions Committee (CEC) oversees ASHRAE’s annual and winter conferences and other specialty conferences and expositions globally. The CEC continually works to improve the conference experience for all attendees. To help keep a “pulse” on the technical issues facing professionals in the HVAC&R marketplace, and to create meetings that reach all of ASHRAE’s constituencies, the CEC seeks ideas for tracks for the Las Vegas 2017 meeting and annual and winter conferences beyond as well as topics for specialty conferences from TC members. Please submit your suggestions to ASHRAE Staff member Tony Giometti (Giometti@ashrae.org). You can also add your track suggestion in the “Comment” section of the TC Activity form for the Atlanta meeting.

D. **REMINdERS**

1. **Employment Discipline added to ASHRAE BIO Online Input Form** -
   A new input field titled Employment Discipline has been added to the ASHRAE online member (BIO)graphical input form and TAC would like ALL TC members to self-declare their employment discipline prior to the start of the new Society year on July 1, 2015 by going to the Members Only section (https://eweb.ashrae.org/eweb/DynamicPage.aspx?Site=ASHRAE&WebKey=8396a37 a-9fc2-4f50-9332-5eebebe73494) and enter their employment discipline information. The link should take you directly to the screen, which is located under demographics.

   Thus far, approximately 30.6% (up 2.6% since Seattle meeting) of TC Members have declared their discipline.

2. **TC Volunteers willing to Support Content Development and Quality Control for Society Technical Program at Society Meetings** -
   Provide to your Section Head after each Society meeting a list of qualified volunteers from your TC that are potential Technical Session chairs and reviewers of session papers that are related to TC’s scope for use by the Conferences & Expositions Committee (CEC) in developing technical content for future technical programs.

3. **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

4. Report on TC/TG/TRG websites in Section (SHs need to report to TCs which sites are not up to date.) - Is your committee website up to date? If not, please ask your webmaster to at least post the latest minutes and the Atlanta meeting times and agenda. If your website has been neglected, add an action item for this meeting to appoint a responsible member of the TC/TG/TRG who will bring it back to life. This form of communication is critical to the efficient operation of your committee, and for attracting new members.

TAC and the Electronic Communications Committee (ECC) recently posted a webinar recording on how to set-up and maintain a basic TC website using the ASHRAE server and TC website template at the following link: http://media.ashrae.biz/webinar/TrainingWebinar.avi

5. Special effort to welcome new members, and visitors (potential members), particularly international members, to TC meetings - Potential new members for your committee have been encouraged to drop-by your meeting. As a result, please make a special effort to recognize and warmly welcome all visitors to your meeting – A TC can never have too many willing and able volunteers.

6. 15-16 Rosters Access & Distribution - Remember, the current 2014-2015 roster for your TC, TG or MTG is in effect until after the June meeting this year – through Wednesday, July 1st.

By now, each TC, TG and MTG chair should have received a PDF & MS-Excel file of their new 2015-2016 roster from their Section Head for distribution to the committee. In addition, each member can view all of the rosters of their committees on the ASHRAE Website. Go to www.ashrae.org <http://www.ashrae.org>, click on the "Membership & Conferences" tab in the header, click on "My 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 "Update Your Bio / View or Edit Tour Profile" link. Now, you should see your current "bio info". Click on "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. Make sure everyone on your committee also knows how to access the roster.

The Provisional Corresponding Member (PCM) position is a relatively new position on TC/TG/TRG rosters. This position allows potential new members to be added by staff to the committee roster any time a request for membership is made by an individual. The position has a 2-year term on the committee. Staff will notify the chair and reissue a new roster to the committee chair any time a provisional member is added. The TC/TG/TRG chair has the option each year during the regular roster update process to convert provisional CMs that have been active participants on the committee the past year into regular CMs or voting members or drop them. If no action is taken, they will time expire from the roster and be removed by staff.

7. Useful TC/TG/TRG/MTG Chair Information and forms on ASHRAE website - Information for TC/TG/TRG and MTG chairs can be found on the Technical Committee page of the ASHRAE website at the following link: http://www.ashrae.org/tcs

The TC/TG/TRG Manual of Procedures (MOP) has been revised to include a new committee type, Multidisciplinary Task Groups (MTGs). MTGs are different from TCs, TGs, and TRGs. The objective of the MTG is to first try to better coordinate and focus the activities of the affiliated TC and non-TC groups (EHC, REF, SSPCs, outside groups, etc.) that make-up the MTG on the task for which the MTG was created without duplicating the functions of a TC or TG so that the task can be completed as efficiently as possible. In special cases, MTGs may also be authorized by TAC to assume some TC/TG functions, such as research, if it is deemed necessary to better complete their task assignment.

Since the need, purpose, and progress of each MTG is reassessed and reaffirmed by TAC each year, there are no term limits for the MTG Chair, Vice Chair, Members and Alternates.

8. Request for each technical committee to briefly review ASHRAE Code of Ethics at start of TC meeting - See the following link for the latest version of the ASHRAE Code of Ethics: https://www.ashrae.org/about-ashrae/
E. RECENT ANNOUNCEMENTS

1. Outstanding TC Award - TAC will continue in the 2015-2016 Society year with the new Outstanding Technical Committee Award. The purpose of the award is to recognize, annually, a single Technical Committee within each TC Section that has the highest measured performance based on a set of weighted criteria as compared to other TCs within that same Section. The goal of this award is to reward TCs for the behaviors and activities that further the goals of TAC and exhibit excellence in the operation of a technical committee. The criterion used is a point system with values assigned to various metrics and activities, which are collected through an updated TC activity form. The award will serve to heighten TC Chair and committee member awareness of what activities are valued to encourage improved performance, and foster friendly competition between TCs within a Section.

2. Recent MTGs that have been formed - TAC approved the formation of the following new Multidisciplinary Task Group (MTG):
   MTG.O&MEE – Operations and Maintenance Activities That Impact Energy Efficiency Scope: MTG.O&MEE will coordinate TC/TG/TRG activities to help support the application of ASHRAE guidelines, Standards and other technical resources to support regulatory bodies, utilities, building owners and others who are attempting to enhance efficiency of existing buildings. Responsibilities include suggestions for research, development and presentation of technical programs of all types on maintenance and its impact on energy consumption and efficiency. It will be especially involved with interactions with those who are introducing and evaluating strategies for building efficiency enhancements.

   For more information on this MTG and the six other active MTGs, please go to the MTG section on the following web page: http://www.ashrae.org/tcs

   If your TC would like to have a voting representative on a particular MTG, please contact the ASHRAE Manager of Research and Technical Services, Mike Vaughn, at MORTS@ashrae.net.

3. Standard 203-2014 now available for use and reference - Standard 203-2014, Method of Test for Determining Heat Gain of Office Equipment Used in Buildings, is published. The Chair of SPC 203, Glenn Friedman, would like to make other project committee chairs aware of it and possibly reference it in other standards. For questions
please contact Glenn Friedman, gfriedman@taylor-engineering.com, (510) 263-1542 direct, (510) 220-5895 mobile."

4. Recent updates to the TC MOP (Manual of Procedures) - Part 4 – Meetings of the

   Manual of Procedures (MOP) for ASHRAE technical committees (TCs/TGs/MTGs/TRGs) has been revised to clarify that attendance at technical committee meetings and subcommittee meetings must be open, except as allowed for by executive session procedures, and that an interim meeting is allowed with proper notification.

   Section and 2.5.1.4 (1) has been amended to allow one Voting Member non-quorum to count towards the minimum number of voting members in Section 2.5.1.1, which is currently 6 voting members.

   Section 5.1.2 has been amended to clarify how quorum is established for TCs with only six members and some designated a Member Non Quorum.

   See the following link for the latest version of the TC MOP
   http://www.ashrae.org/tcs

5. TC Activity Form - TAC has developed a new TC activity form that they would like all TCs to use at this meeting to report to their section head. This form can downloaded from the Technical Committee webpage under the “TC Forms and Documents” page - https://www.ashrae.org/standards-research--technology/technical-committees/tc-formsand-documents. Section heads can also provide an electronic copy of the form if requested.

6. TAC Presentation template for TC members to use with local Chapter - The new presentation template allows TC members, without a lot of effort, to give a presentation to their local chapter on TAC and the TCs in general and to also customize a few slides with information specific to their own TC or TCs. The template is posted now on the Technical Committee page of the ASHRAE website for download.

7. TC Master Calendar – Now Available through Google - The Technical Committee Master Calendar is now available through Google. In order to access this calendar you need to have a Google account.

   Once you log into your Google account, follow the instructions below:
To add a friend's calendar, just follow these steps:
- At the bottom of the calendar list on the left, click Add and select Add a friend's calendar.
- Enter the appropriate email address (techservices1791@gmail.com) in the field provided, then click Add.

This calendar is public and will appear under 'Other Calendars' in the left column.

To set up Google Calendar Sync to your Outlook:
- Make sure you're using a supported operating system and Outlook version. Download Google Calendar Sync (version 0.9.3.6) at http://dl.google.com/googlecalendarsync/GoogleCalendarSync_Installer.exe
- Once a dialog box appears, click Save File. The downloaded file should open automatically. If it doesn't, manually open it from your browser's download window.
- Click OK to confirm that you're aware this is an executable file.
- Read through the Google Calendar Sync Terms of Service, and click I Agree.
- Follow through the Installation Options and click Install to finish the set-up process.

Once Google Calendar Sync is installed on your computer, the Google Calendar Sync Settings window will appear:

In the Settings window, enter your email address and password and select the Sync Option you prefer. Read about each Sync Option. You'll also be able to set the time interval for syncing to occur. Please keep in mind that 10 minutes is the minimum time interval allowed.

After the initial set-up, you can access the Google Calendar Sync Settings window again by double-clicking the calendar icon in your Windows System Tray.

F. UPCOMING ASHRAE CONFERENCES
1. Program Focus at Atlanta Annual Conference - The Atlanta Conference Technical Program addresses broad topics in the application of technology to practice, specific applications in hydronic heating systems, variable refrigerant flow systems, O&M and indoor
environmental quality, as well as new reports on research taking place worldwide. Specific program tracks are as follows:

- Building Operation, Maintenance, and Optimization/Commissioning Track
- High Performance Building Track
- HVAC&R Fundamentals and Applications Track
- HVAC&R Systems and Equipment Track
- Indoor Air Quality Track
- Laboratories Track
- Modeling throughout the Building Life Cycle Track
- Moving Advanced Energy Design Guidance to Mainstream Track
- Refrigeration Track
- Research Summit Track

The Atlanta conference will also host the third annual ASHRAE Research Summit, which will present innovations in HVAC&R research with particular emphasis on high performance building design and its role in a clean energy economy, and brings together researchers to present and discuss the latest research. Researchers will present papers, seminars and forums or participate in panel discussions. Also, highlights on ongoing ASHRAE funded research will be presented.

2. **Orlando Meeting - January 23 - 27, 2016**
   - Orlando Seminar and Forum Session Proposals are due August 10, 2015
   - Revised conference papers / Final Technical Papers due August 21, 2015
   - Seminar, Forum, Workshop Accept/Reject Notifications sent September 11, 2015
   - All presentation files (PPT) due online – January 4, 2016
   - Conference Website: [http://www.ashrae.org/orlando](http://www.ashrae.org/orlando)

3. **St. Louis Meeting - June 25 – June 29, 2016**
   - St. Louis Conference Paper Abstracts Due are due September 14, 2015
   - Technical Papers initial drafts due September 14, 2015
   - Conference Paper Abstract Accept/Reject Notifications sent October 5, 2015
   - Website Opens for Seminar, Forum and Workshop Proposals on January 4, 2016
Program Focus at St. Louis Annual Conference

i. Track 1: Advances in Refrigeration Systems and Alternative Refrigerants
   Track Chair: Frank Schambach
   Email: frankschambach@mindspring.com
   This track seeks papers and programs that explore the wide range of refrigeration systems under development with special emphasis on the use of alternative refrigerants in vapor compression machines to address environmental concerns.

ii. Track 2: Research Summit Track
    Chair: Jeffrey Spitler
    Email: spitler@okstate.edu
    The fourth annual Research Summit seeks papers that report results on any aspect of ASHRAE-related research including heating, cooling, ventilation, other energy uses in the engineered environment and associated environmental aspects.

iii. Track 3: Fundamentals and Application
     Track Chair: David E. Claridge
     Email: dclaridge@tamu.edu
     Fundamental information and applications of fundamentals related to all aspects of HVAC&R are welcome. This can range from psychrometric properties and processes to combustion, controls, HVAC system and envelope fundamentals and beyond.

iv. Track 4: HVAC Systems and Equipment
    Track Chair: Alan Neely
    Email: alan_neely@pghcorning.com
    This track will include presentations on best practices to implement traditional, non-traditional, and hybrid approaches to achieve successful HVAC&R systems design. Objectives include high
performance systems and equipment, LEED certified designs and sustainable buildings.

v. Track 5: Smart Building Systems/Remote Monitoring and Diagnostics
Track Chair: Samir Traboulsi
Email: traboulsi.samir@gmail.com
Smart buildings address HVAC&R equipment operation (chiller sequencing, soft start), integration into complete systems and can potentially interface with multiple building complexes and micro grid operation. This track includes papers on advanced communication protocols, system integration, BMS tools, data management and analysis.

vi. Track 6: Indoor Environment: Health, Comfort, Productivity
Track Chair: Dennis Alejandro
Email: denzjac@yahoo.com
Buildings and other enclosed spaces are increasingly required to provide safe, healthy environments in an energy efficient manner. Papers in this track will review the balance between environmental health and energy efficiency in buildings and help define future education, policy and research directions.

vii. Track 7: Professional Skills Beyond Engineering
Track Chair: Rachel Romero
Email: rachel.romero@nrel.gov
This track seeks to ensure professional skills are being developed and maintained beyond engineering essentials. Emphasis will be placed on meeting the professional development and business needs of today and converting them into the building blocks of tomorrow’s success.

viii. Track 8: Renewable Energy Systems and Net Zero Buildings
Track Chair: Kevin Gallen
Email: kevin@gallenengineering.com
Wind, hydroelectric and solar are just a few of the alternative and/or renewable energy sources that are being used in HVAC design as we strive for Net-zero and high efficiency buildings. This track will address recent advances in alternative energy systems and equipment and new design strategies for achieving Net-zero buildings.
G. UPCOMING WORKSHOPS AND CONFERENCES

1. 2015
   i. ISHVAC-COBEE 2015: 9th International Symposium on Heating, Ventilation and Air Conditioning (ISHVAC) and 3rd Conference on Building Energy and Environment (COBEE) - July 12 – 15, 2015 - Tianjin, CHINA – Contact: http://www.cobee.org/


   iii. Cold Climate 2015 - October 20 – 23, 2015 - Dalian, CHINA – Contact: http://www.coldclimate2015.org/

   iv. 11th International Conference on Industrial Ventilation - October 26 – 28, 2015 - Shanghai, CHINA – Contact: http://www.ventilation2015.org/

   v. IBPSA 2015 (14th International Conference of the International Building Simulation Conference) – December 7 – 9, 2015 - Hyderabad, INDIA – Contact: http://www.bs2015.in/

2. 2016


Appendix B
MTG OM&EEE
S. Bendapudi
From: Thursten Simonsen [mailto:thursten@simonsens.net]
Sent: Sunday, June 28, 2015 9:41 PM
To: SH2@ashrae.net; SH4@ashrae.net; SH6@ashrae.net; SH7@ashrae.net; SH8@ashrae.net; SH9@ashrae.net; tc0201@ashrae.net; tc0202@ashrae.net; tc0203@ashrae.net; tc0204@ashrae.net; tc0205@ashrae.net; tc0206@ashrae.net; tc0207@ashrae.net; tc0208@ashrae.net; tc0209@ashrae.net; tc2HVAC@ashrae.net; tc0401@ashrae.net; tc0402@ashrae.net; tc0403@ashrae.net; tc0404@ashrae.net; tc0405@ashrae.net; tc0407@ashrae.net; tc0410@ashrae.net; TRG4IAQP@ashrae.net; tc0601@ashrae.net; tc0602@ashrae.net; tc0603@ashrae.net; tc0605@ashrae.net; tc0606@ashrae.net; tc0607@ashrae.net; tc0608@ashrae.net; tc0609@ashrae.net; tc0610@ashrae.net; tc0701@ashrae.net; tc0702@ashrae.net; tc0703@ashrae.net; tc0704@ashrae.net; tc0705@ashrae.net; tc0706@ashrae.net; tc0707@ashrae.net; tc0708@ashrae.net; tc0709@ashrae.net; tc0801@ashrae.net; tc0802@ashrae.net; tc0803@ashrae.net; tc0804@ashrae.net; tc0805@ashrae.net; tc0806@ashrae.net; tc0807@ashrae.net; tc0808@ashrae.net; tc0809@ashrae.net; tc0810@ashrae.net; tc0811@ashrae.net; tc0812@ashrae.net; tc0901@ashrae.net; tc0902@ashrae.net; tc0903@ashrae.net; tc0904@ashrae.net; tc0905@ashrae.net; tc0906@ashrae.net; tc0907@ashrae.net; tc0908@ashrae.net; tc0909@ashrae.net; tc0910@ashrae.net; tc0911@ashrae.net; tc0912@ashrae.net
Subject: [External] ASHRAE MTG.O&MEE - Request for Members

TC Chairs,

A new MTG was recently approved by TAC, named MTG.O&MEE (Operations and Maintenance Activities That Impact Energy Efficiency).

As approved by TAC, MTG.O&MEE will coordinate TC/TG/TRG activities to help support the application of ASHRAE guidelines, Standards and other technical resources to support regulatory bodies, utilities, building owners and others who are attempting to enhance efficiency of existing buildings. Responsibilities include suggestions for research, development and presentation of technical programs of all types on maintenance and its impact on energy consumption and efficiency. It will be especially involved with interactions with those who are introducing and evaluating strategies for building efficiency enhancements. This MTG will maintain interface with and call on the resources of TCs in Sections 2, 4, 6, 7, 8 and 9 and maintain an especially close relationship with Standards 90.1 & 2. It will also maintain a relationship with GGAC. It will both draw on their knowledge and contribute areas of interest that it may be productive for them to consider.

As the chair of MTG.O&MEE, I am seeking to involve more TC's. Each TC with an interest may have one voting member assigned to the MTG by the TC Chair. Currently, voting members have been identified by TC 2.8, TC 7.3, TC 7.9, and the GGAC committee.

I would ask you to consider your TC membership, and send me the name and email address of a person in your TC who would be able to serve on this MTG. I hope to turn in an updated roster to TAC by this coming Friday, July 3rd; therefore addressing this request during the summer meeting would be most beneficial.

Once the roster is updated and formalized by ASHRAE staff, then I'll call for the first meeting by conference call, within about the next 45 days. At this time, I expect meetings will be by conference call about 4 times per year, with email communication in between.

Feel free to contact me with any questions or comments.

Sincerely,

Thursten Simonsen
Chair, MTG.O&MEE

--
Thursten Simonsen
thursten@simonsens.net (210)
606-6485 mbl/txt
(512) 832-6617 hm
Appendix C
Research Subcommittee Report
J. Huber
Research Subcommittee
Chairs' Breakfast Presentation

Annual Meeting 2015 – Atlanta
Carl Huber, RAC Vice Chair

Monday, June 29, 2015

Agenda

- Mission & Vision
- Current Research Projects
- RTAR & WS Status
- TRP & URP Status
- Stage Funding & Project Monitoring
- ASHRAE Research Efficiency Forum
- ASHRAE 2014 Strategic Plan
  - Residential Emphasis
  - Impact of Standards & Technology
- RAC Web Based Training
- RAC Personnel Update
ASHRAE Mission & Vision

- **MISSION:** To advance the arts and sciences of heating, ventilation, air conditioning, and refrigeration to serve humanity and promote a sustainable world.

- **VISION:** ASHRAE will be the global leader, the foremost source of technical and educational information, and the primary provider of opportunity for professional growth in the arts and sciences of heating, ventilation, air conditioning and refrigeration.
**ASHRAE**

**Current Research Status**

- **61** active Research Projects
- **Total value - $10 million**

Since July 1, 2014:

- **11** Projects were completed
- **11** New projects approved
- **13** Tentative Research Project (TRPs) released for bid (no projects on-hold due to funding)

**ASHRAE**

**RTAR & WS Status**

- **RAC evaluated 9 RTARs**
  - 3 Accepted
  - 4 Accepted w/Comments
  - 2 Rejected
- **RAC evaluated 8 WS**
  - 4 Accepted
  - 1 Conditionally Accepted
  - 1 Returned
  - 2 Rejected
ASHRAE

TRP's & URP's

- 8 TRP's bid packages to evaluate
- 4 URP's under review

Money tight this fall - will be out Next year
Not all approved UEs may be sent out for bid

ASHRAE

Stage Funding and Project Monitoring

Kishor Khankari, Ph.D.
RAC, RPS Chair

Research Administration Committee
Motivation

- Improve the process for monitoring Research projects and incorporate a few checks and balances in the process.
- Develop close relationship between the completed work and payments to contractors.
- Identify signs of budget overruns.
- Identify and stop the project at right time without incurring additional costs.

Problem with large Project $500,000

Stage Funding

- All WS and TRPs must have milestone chart and associated costs for each milestone as a percent of the total project cost.
- All proposals should have a chart showing each milestone and the actual cost breakdown for each milestone. Bidders may propose a different milestone chart with associated costs than suggested in the RFP.
- This should be included as a part of WS and proposal evaluation process.
- A questionnaire will be sent to PMS Chair at each milestone level to obtain the project status. The project should include the review and approval of intermediate results/deliverables by the PMS at logical milestone points during the project.
- Payments at each milestone level will be made to the contractor only after approval of each milestone deliverables by PMS.

*Response may be overkill
*burden on PMS
*Lack of experience
Example of a Milestone Chart

<table>
<thead>
<tr>
<th>Payment #</th>
<th>Milestone Description</th>
<th>Payment Amount</th>
<th>% of Contract Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Design Complete</td>
<td>$100,000</td>
<td>10%</td>
</tr>
<tr>
<td>2</td>
<td>Construction Complete</td>
<td>$200,000</td>
<td>20%</td>
</tr>
<tr>
<td>3</td>
<td>Final Acceptance</td>
<td>$300,000</td>
<td>30%</td>
</tr>
<tr>
<td>4</td>
<td>Final Report</td>
<td>$400,000</td>
<td>40%</td>
</tr>
<tr>
<td>5</td>
<td>Final Review</td>
<td>$500,000</td>
<td>50%</td>
</tr>
<tr>
<td>6</td>
<td>Final Acceptance</td>
<td>$600,000</td>
<td>60%</td>
</tr>
<tr>
<td>7</td>
<td>Final Report</td>
<td>$700,000</td>
<td>70%</td>
</tr>
<tr>
<td>8</td>
<td>Final Review</td>
<td>$800,000</td>
<td>80%</td>
</tr>
</tbody>
</table>

Payment Conditions:
- Milestone #1 – PMS Acceptance of L&I Review Deliverable
- Milestone #2 – PMS Acceptance of Test Protocols
- Milestone #3 – PMS & TC Acceptance of draft final report

ASHRAE Questionnaire for PMS Chair

- Are all the deliverables received for a milestone?
  - If the NO – Red Flag – Stop Payment
  - If YES, has PMS reviewed and approved the deliverables?
    - If NO – Red Flag – Stop Payment and stop work
- Do you anticipate any changes in the scope of work?
  - If YES
    - Have you received approval from TC for the proposed changes in the scope?
      - If NO – Red Flag – Stop Payment and stop work
    - Do you anticipate any changes in the project costs?
      - If YES – Red Flag – Stop Payment and stop work
      - Needs RAC Review
Milestone Deliverables Review

Milestone Stage

Deliverables received

NO

Stop Payment

YES

Deliverables Approved by PMS

NO

Stop Payment

YES

Release Payment

Milestone Work Scope Review

Milestone Stage

Yes project scope change

NO

Continue the project

YES

No Change

NO

Stop Work

Terminate the project

YES

Continue with modified scope

No scope change

NO

Continue without scope change

YES

Continue without scope change

Release approved

YES

Continue with modified scope

NO

Stop Work

Terminate the project

* Any wording change or scope change needs TC approval, RAC must approve budget change

* Mike Vaughan must be notified

Copy Act on all
ASHRAE Research Process Efficiency Forum

Monday, June 29, 11:00 AM-12:00 PM
FORUM 3 (BASIC)
Is the ASHRAE Research Process Efficient?
Task: Research Summit
Kishor Kharkori, Ph.D.
RAC, RPS Chair

ASHRAE Research Administration Committee

ASHRAE Strategic Plan 2014

Dom Rivere, Ph.D.
RAC Chair

ASHRAE Research Administration Committee
ASHRAE Strategic Plan 2014

- Initiative 5 – ASHRAE’S Role in the Residential Sector
  - Translate science & technology into practical tools that drive effective building design, operation, and management
  - Perform research into improving the residential built environment
  - TAC/RAC increased residential emphasis
ASHRAE Strategic Plan 2014

- Initiative 5 – ASHRAE’S Role in the Residential Sector
  - Research Strategic Plan Goal 3: reduce energy consumption for HVAC&R, water heating, and lighting in existing homes under review for updating
  - TC2.08 addition of residential chapter to ASHRAE Green Guide: The Design, Construction, And Operation Of Sustainable Buildings
  - Your suggestions welcome integrated approach collaboration beyond ASHRAE

ASHRAE Strategic Plan 2014

- Initiative 1B – Conduct research program to estimate impact of ASHRAE standards/technology on energy savings and performance determine actual savings for selected segments identify key factors in savings documents directed to consulting engineers

- MTG Proposal in preparation for cross-functional approach: members from TCs, SSPCs, AEDGs, PubEd, Marketing

ASRHA’s exec will be visiting consulting firms to show ASHRAE’s value
RAC Training

- Web Based Training Modules
  - RTAR Writing
  - WS Writing
  - PES Functions & Responsibilities
  - PMS Functions & Responsibilities
- Target June 2016

Your Research Liaisons

- 1- Arthur Giesler
  - Shinsoke Kato
- 2- Harvey Sachs
  - Pawel Wargocki
- 3- Mark Spatz
- 4- Xudong Yang
- 5- David John
- 6- Stephen Hancock
  - Harvey Sachs
- 7- Phil Haves
  - Chris Wilkins
- 8- David Yashar
  - Chris Wilkins
- 9- Jeff Gatlhin
- 10-John Shonder
  - H. Ezzat Khalifa
**ASHRAE**

RAC Personnel Changes

Rolling Off
- 1 - Art Giesler
- 6 - Stephen Hancock
- 8 - David Yashar
- 10 - John Shonder
- RAS Chair - Pradeep Bansal

Executive Committee Changes
- Vice Chair - Art Giesler
- RAS Chair - John Shonder

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**ASHRAE**

MANY THANKS TO YOU AND YOUR COMMITTEES!

"RESEARCH IS THE FOUNDATION OF ASHRAE"

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Research Administration Committee