

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.**  
**1791 Tullie Circle, N.E./Atlanta, GA 30329**  
**404-636-8400**

**TC/TG/TRG MINUTES COVER SHEET**

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

TC/TG/TRG NO.: TC 4.1 DATE: January 2, 2018

TC/TG/TRG TITLE: LOAD CALCULATION DATA AND PROCEDURES

DATE OF MEETING: June 26, 2017 LOCATION: Long Beach, CA

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
<b>Voting</b>		<b>Voting</b>		<b>Visitors</b>
Bob Doeffinger				Dennis Wessel
Larry Sun				Nicholas Harlow
Suzanne LeViseur		<b>Non-Voting</b>		David Westbery
Steve Bruning				Adam Williams
Chip Barnaby		Lucy Amankwah		Ed Sowell
Jingjuan Feng		David Ariyo		Jeff Landreth
Chris Wilkins		Fred Bauman		Allen Gilliland
Elyse Malherek		Alireza Behfar		Leslie Jonsson
Rolando Legarreta		Andrew Braum		
Jeff Spitler		Sonia Brown		<b>Provisional CM not in attendance</b>
<b>Non-Voting</b>		Jui-Chen Roger Chang		Mufeed Alshakhori
		Charlie Curcija		Benjamin Brannon
Glenn Friedman		Christopher Delgado		Michael P Case
Stephen Roth		Philip Farese		Daniel Bustamante
Russell Taylor		Carson Banister		Carlos Duarte
Jim Pegues		Alan Paul Dunlavy		Amanda J Kilbane
Christian Bach		Joe Ferdelman		Siwei Li
Rachel Spitler		Amit Bhansali		Nicholas Scott Matthews
Stephen Roth		Daniel Fisher		Neeraj Pranavam Raveendran
Russell Taylor		Stephen Roth		Sahil Priyadarshi
<b>Provisional CM</b>		Enrica Galasso		Miguel Quinones
Scott Hellendrung		Stephen Kavanaugh		Muralidharan Venkidasamy
Francisco J Gomez		Ken-Ichi Kimura		Yao Yu
Alba		Som Shrestha		ZayZay
		Bryan Morris		Enrica Galasso
		Gabrielle Powell		
		Ghani Ramdani		
		Brian Rock		
		Ahmad Sleiti		
		Laura Southard		
		Branko Todorovic		
		Edmund SW Wong		
		Justin Wong		
		Kevin Wood		
		Ke Xu		

**DISTRIBUTION:**

All Members of TC/TG/TRG

**ADDITIONAL DISTRIBUTION:**

TAC Chairman: Michael Bilderbeck

TAC Section Head: Dennis Wessel, P.E.

Research Liaison: Prof. Xudong Yang

ALI/PDC: James W Bochat

2017 HOF:

Standard Liaison:

Mgr of Standards:

Staff Liaison:

David P. Yuill, P.E.

James Dale Aswegan

Stephanie Reiniche

Michael R. Vaughn

*"These draft minutes have not been approved and are not the official, approved record until approved by this committee."*



## ASHRAE Technical Committee 4.1

*“Commitment to the ASHRAE Code of Ethics – In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity and respect for others, and we shall avoid all real or perceived conflicts of interests. (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>.)”*

### **Agenda for -TC4.1 Load Calculation Data & Procedures**

**Long Beach  
June 26, 2017**

**TC4.1 Load Calculation Data and Procedures  
Monday, 2:15 PM to 4:15 PM Wilmore,  
Renaissance**

- |   |  |                       |
|---|--|-----------------------|
| 1 | Call to Order  | Bob Doeffinger        |
| 2 | Roll Call  | Suzanne LeViseur      |
| 3 | Introduction of Visitors   | Bob Doeffinger        |
| 4 | Approval and/or Corrections to Las Vegas Meeting Minutes<br>Larry Sun moved/Rolando Legarreta seconded – 9-0-0 CNV | Bob Doeffinger        |
| 5 | Liaison Comments   |                       |
|   | Section Head   | Dennis Wessels, PE    |
|   | • Notes from CEC and TAC (see attachment #1)   |                       |
|   | • Corrections on Roster? By July 8 <sup>th</sup> – send to Tara  |                       |
|   | • Updates on website – make sure they are up to date   |                       |
|   | • Name badges are available for non-registered meeting attendees of TC meetings.                                   |                       |
|   | Assistant Mgr. Standards   | Ryan Shauley          |
|   | • Pushing standards involvement  |                       |
|   | • Membership on the various standards is available   |                       |
|   | • We are up to date on 180 and 203   |                       |
|   | Liaison's Not Present:   |                       |
|   | Chapter Technology Transfer  | Harris Sheinman, PE   |
|   | Research   | Prof. Xudong Yang     |
|   | Handbook   | David P. Yuill        |
|   | ALI/PDC  | James W. Bochat       |
|   | Standards Liaison  | James Dale Aswegan    |
|   | Staff, Research/Tech Services  | Michael R. Vaughn     |
|   | TAC Chairman   | Michael R. Bilderbeck |



## ASHRAE Technical Committee 4.1

- 6 Research Subcommittee Report Rolando Legarreta  
Update on progress of  
RP 1729 – PMS report (see Attachment #2) – 15 months left (8/18 project due)  
  
RP 1742 – PMS report (see Attachment #2) – completed (in paper phase) seminar presented this morning.  
~50 people present (Preview of presentation at PMS meeting). Rush to get info into handbook – succeeded  
in doing so. How long until we do this RP again (Steve 2025 handbook cycle)? Average plug load is  
0.34W/sq.ft – max to 1.5W/sq ft  
Peak load defined based on their research – gave us a rolling 15 minute average of the peak load.  
Diversity factors based on actual buildings operation  
  
RP 1816 – Loads on Medical Imaging - Co-sponsor with 9.6 – RTAR accepted/working on work statement.  
  
Weather data approach – discussed yesterday – no need to change the approach.
- 7 Programs Subcommittee Report (Attachment #2) Glenn Friedman  
Glenn needs either help or replacement – Som Shrestha volunteered to help.  
Brainstorming regarding different possible programs.  
a. Fundamental program about load calculations – load calcs and work flow; energy modelling and  
work flow; and energy estimating  
b. Different entities doing load calcs vs energy modelling. Involve TC 4.7 possible.  
c. Trending for plug loads; cfm/sqft, etc.  
d. Chip Barnaby moved/Suzanne LeViseur second for program (seminar) – 9-0-0 CNV  
Program titled: Low Energy Design Impacts on Peak Heating and Cooling Load Calculations.
- 8 Standards Subcommittee Report Glenn Friedman  
These standards were reaffirmed after Winter meeting (both standards)
- 9 Handbook Subcommittee Report  
Residential Chap 17 no comments Chip Barnaby  
Non-Residential Chap 18 Thank teams of researchers for updates Steve Bruning  
Updates to Handbook – if we can't get tables updated, pull out of chapter next go round Jim Pergues
- 13 ASHRAE Website for TC4.1 – no comments- up to date Jim Pegues
- 14 Old Business -none Bob Doeffinger
- 15 New Business Bob Doeffinger  
Doug Hittle – remembrance of him  
Reaffirmed our scope

Officers and voting members for 2016/2017:

Robert Doeffinger	Chair	Voting
Larry Sun	Vice Chair	Voting
Suzanne LeViseur	Secretary	Voting
Steve Bruning	Handbook Subcommittee Chair	Voting
Glenn Friedman	Standards/Programs SubC Chair	Nonvoting
Rolando Legarreta	Research Subcommittee Chair	Voting
Chris Wilkins		Voting
Jeff Spitler		Voting
Charles Barnaby		Voting
Jingjuan Feng		Voting
Elyse Malherek		Voting

Attachment #3 – Sign-in log from Long Beach meeting.



## ASHRAE Technical Committee 4.1

### Meetings

#### **TC 4.1 Load Calculation Data and Procedures**

Monday 2:15pm-4:15pm  
Wilmore, (R-2)

#### **TC 4.1 Handbook Subcommittee**

Sunday 3:00pm-4:00pm  
Bixby 2, (R-2)

#### **TC 4.1 Research Subcommittee**

Sunday 4:00pm-5:00pm  
Bixby 2, (R-2)

#### **TC 4.1 Programs & Standards Subcommittees**

Sunday 5:00pm-6:00pm  
Bixby 2, (R-2)

#### **RP-1729 Project Monitoring Subcommittee**

##### **Radiant Cooling**

Sunday 8:00am-9:00am  
Alford, (R-2)

#### **RP-1742 Project Monitoring Subcommittee Updates to Measurements of Office Equipment Heat Gain Data**

Sunday 6:00pm-7:00pm  
(Bixby 2 Renaissance)

### **Seminar 19**

Changes to Heat Gain Tables in the Handbook  
Commercial Load Calculations, Chapter 18  
Monday 8:00am-9:30am LBCC, Room 201A

**AGENDA**  
**SECTION TC/TG/TRG CHAIR'S BREAKFAST MEETING**  
2017 Annual Meeting  
Long Beach, CA

**Sunday, June 25th**

**6:30 A.M. – 8:00 A.M. PDT**

**Renaissance Hotel – ALL Section meetings located on either 1<sup>st</sup>, 2<sup>nd</sup>, or 3<sup>rd</sup> floor as noted below.**

**Section 1**, Bixby 1 Room – 2<sup>nd</sup> Floor  
**Section 3**, Dawson Room – 3<sup>rd</sup> Floor  
**Section 5**, Pike 3 Room – 1<sup>st</sup> Floor  
**Section 7**, Broadlind 2 Room - 2<sup>nd</sup> Floor  
**Section 9**, Pike 1 Room – 1<sup>st</sup> Floor  
**MTG Section**, Tichenor Room – 2<sup>nd</sup> Floor

**Section 2**, Bixby 2 Room – 2<sup>nd</sup> Floor  
**Section 4**, Broadlind 1 Room – 2<sup>nd</sup> Floor  
**Section 6**, Bixby 3 Room – 2<sup>nd</sup> Floor  
**Section 8**, Pike 2 Room – 1<sup>st</sup> Floor  
**Section 10**, Nieto Room - 2<sup>nd</sup> Floor

Note: The agenda and times estimated are for guidance only and should be modified to be sure the most important information is discussed and that there is adequate time to discuss things important to the committee chairs. Note that the time estimates shown allow for other important business to be conducted within the time frame allotted.

- a.1. Introduction of TC/TG/TRG/MTG Chairs, Vice Chairs, and guests (5 minutes).
- a.2. Review and approval of agenda (2 minutes). (note that you might want to solicit additions and corrections at the time the draft agenda is sent to the TC Chairs – it is almost impossible to do anything in only 2 minutes)
- a.3. Summarize discussion from last meeting and status of actions assigned, if any (5 minutes).
- a.4. Liaisons from other committees should each be given a chance to speak and distribute information pertinent to the section from their committee. An effort should be made to accommodate their schedules without major disruption of the Section meeting (15 Minutes).
  - a.4.1. Research Administration
  - a.4.2. Conference and Exposition Committee (CEC)
  - a.4.3. Handbook
  - a.4.4. Other Standing Committees
- a.5. Discuss the MBOs set for the year and how the section can work together to address them (10 minutes).
- a.6. Review summary report for the Section prepared from the TC/TG activity database and TAC (15 minutes).
  - a.6.1. Section activities and trends will be discussed relating to membership, research, programs, publications and new communication tools and services.
  - a.6.2. Do TCs prefer to go back to a paper activity form instead of MS-Excel form used now?
- a.7. Identify shared opportunities and challenges for section (10 minutes).
- a.8. Announcements and Reminders for TC/TG/TRG & MTG Chairs (Handout)
- a.9. Adjourn.

### TC/TG/TRG Activity Feedback Form

Please provide feedback on your TC/TG/TRG activities and return this form by **Tuesday night 9:00 pm** to your Section Head by email or drop off a printed copy in the Section Head's mailbox folder outside the ASHRAE Headquarters Room.

**Include activities performed since the last TC meeting (e.g. any letter ballots, submissions to RAC, award nominations, etc.)**

PLEASE DO NOT LEAVE NUMERIC CELLS EMPTY. ENTER 0 IN CELLS IF THERE IS NO COUNT.

[illegible]

**Announcements and Reminders for TC/TG/TRG & MTG Chairs  
LONG BEACH 2017**

**A. NEW!**

1. **Discuss and confirm that TGs, TRGs, and MTGs in section will continue in 17-18 Society Year or disband**  
TBD

2. **17-18 Rosters Access & Distribution** - Remember, the current 2016-2017 roster for your TC, TG or MTG is in effect until after the June meeting this year – through Friday, June 30th.

TC, TG and MTG chairs will soon receive a PDF & MS-Excel file of their new 2017-2018 roster from their Section Head or staff for distribution to the committee. In addition, each member can view all of the rosters of their committees on the ASHRAE Website once the new Society year goes into effect. Go to [www.ashrae.org](http://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 once the new Society year begins.

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.

3. **Let's Celebrate ASHRAE's Technical Excellence Historically!**

ASHRAE is highly regarded for its technological advances. Consider that these advances evolved from the efforts of our predecessors and you, and the current members of ASHRAE's Technical Committees in advancing HVAC&R technology are building on a deep foundation. So, what is the historical foundation of your Technical Committee specialty? ASHRAE will be celebrating its 125th anniversary in a couple years. The Historical Committee has a project to publish articles in the ASHRAE Journal and organize paper presentations celebrating our technical heritage for the anniversary. We plan to emphasize technical advances after 1920. Can you help with an article or a



## Announcements and Reminders for TC/TG/TRG & MTG Chairs LONG BEACH 2017

paper or can your TC organize and sponsor a program session for the 2019-2020 meetings?

Here is a list of topics that TC members have already suggested.

- Development of open communication protocols such as BACNET.
- Modern improvements in psychrometrics (Goff & Gratch).
- History and effect of the Environmental movement on our technology. How technology and equipment has improved the indoor environment.
- The refrigerant revolution
- Solving the problems of "sick buildings."
- The re-discovery of past technology and its application today (such as district energy, hydrocarbon refrigerants, off peak energy storage, "total energy" systems, etc.)
- History of the application of electronics to HVAC&R technology.
- ASHRAE's long history in applying innovative technology.
- History and importance of frozen food technology.

All of these topics and others you may think of need to be written up and/or presented by someone.

How about YOU?

The 125th anniversary will be celebrated at the 2020 winter and Annual meetings. The Historical Committee has been charged with the responsibility of organizing Society and industry history projects for the 125th. If you would like to submit an article or a paper or organize a program session, contact Emily Sigman, Historical Committee Staff Liaison at [esigman@ashrae.org](mailto:esigman@ashrae.org).

There is a deadline – please submit abstracts or outlines before **September 30, 2017**.

#### **4. Oversight of TC websites with regard to *Technical Bulletins* (White Papers) and alignment with Society positions, policy, or opinions**

TCs are allowed to develop Technical Bulletins - A Technical Bulletin does not result from a technical meeting and is a brief 1-2 page statement on a special interest HVAC&R topic that has been developed by either a technical or grassroots committee of ASHRAE. After the TC approves the Technical Bulletin, TAC is responsible for coordinating a peer review by a minimum of three persons with expertise in the field of the bulletin before it can be posted. In addition, ASHRAE's policy for websites states the following: "4 (3) f. **Statements and presentations may not appear on web sites that state, purport, or imply that they present ASHRAE positions, policy, or opinions.**"

#### **5. Additional TC E-mail Position Aliases Now Available**

New position e-mail alias addresses have now been created for each of the remaining mandatory positions of the Technical Committee management team (Secretary,

## Announcements and Reminders for TC/TG/TRG & MTG Chairs LONG BEACH 2017

Standards Sub. Chair, Program Sub. Chair, Handbook Sub. Chair, and Webmaster). The 16-17 E-mail Alias list with these new position aliases is posted on the ASHRAE website [www.ashrae.org/TCs](http://www.ashrae.org/TCs) under the heading *Procedures, Forms & Information for TCs/TGs/MTGs and TRGs*. The new 17-18 E-mail Alias list will be posted in the same location shortly after the Long Beach meeting.

### 6. New Restructured TC MOP (Manual of Procedures) issued

TAC has restructured the TC MOP so that it is easier to navigate and find information. The new TC MOP can be found on the ASHRAE website [www.ashrae.org/TCs](http://www.ashrae.org/TCs) under the heading *Procedures, Forms & Information for TCs/TGs/MTGs and TRGs*.

### 7. Distribution of TC minutes changed in TC MOP

The TC MOP and *TC/TG/MTG/TRG Minutes Cover Sheet* form have both been updated and you are no longer required to send the TAC chair a copy of your minutes after each meeting. The new minutes cover sheet can be found on the ASHRAE website [www.ashrae.org/TCs](http://www.ashrae.org/TCs) under the headings *Procedures, Forms & Information for TCs/TGs/MTGs and TRGs – Routine Forms for TC/TG/MTGs/TRGs*.

### 8. How to Import Your TC Roster Information into MS-Outlook

Detailed instructions on how to import your TC roster information into MS-Outlook has been created and an e-mail announcement will be issued to all TC chairs, vice chairs, and secretaries once these instructions and the restructured TC MOP are posted to the TC page of the website ([www.ashrae.org/TCs](http://www.ashrae.org/TCs))

### 9. Updated TAC Presentation Template Available for TC members to use with local Chapter

TAC recently updated the standard presentation and presentation notes that TC members can use, without a lot of effort, to explain what TCs do for the Society and how that work benefits members in your local ASHRAE Chapter. You should also know that use of this presentation at a chapter meeting in SY 17-18 will earn a chapter 50 (100 points maximum) PAOE points. Additional PAOE points are also possible in SY 17-18 for a presentation(s) on the work of one specific TC.

The new presentation and presentation notes files are posted now at the following link [www.ashrae.org/tcs](http://www.ashrae.org/tcs) under the heading *General TC Information* at the top of the page in case you prefer to direct others to these files posted online. The presentation material is now also available in both English and Spanish.

### 10. Basecamp Information from ECC

More and more TCs and standing committees are making use of ASHRAE's subscription to Basecamp3 to better organize, store, and distribute online committee files that are needed for their meetings through a dedicated committee Basecamp site. If you would like to learn more about Basecamp and how to request a site for your particular committee, please go to the Electronic Communications Committee (ECC) web page:

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(<https://www.ashrae.org/society-groups/committees/electronic-communications-committee> ) and scroll down to the section titled *Guidance for Basecamp 3*

### B. AT THIS MEETING

#### 1. On-Site Training Options

##### i. **TC/TG/TRG Chair's Training Workshop Reminder**

Sunday June 25th, 9:45-10:45 AM in Room #101A, 1<sup>st</sup> Floor, in the Long Beach Convention Center. The training will start with a brief presentation on how to run Effective Meetings and then highlight some of the online resources that are available through the TAC training portal for additional training and information on a variety of topics. The training session will also have a Q&A session so that you can also get answers to your specific questions.

##### ii. **RAC's Research Subcommittee Chair's Breakfast**

Monday, June 26th, 6:30 AM – 9:30 AM in Regency room, 4<sup>th</sup> Floor, Hyatt Regency Hotel. 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 changes to the *Research Manual*.

##### iii. **TC Program Subcommittee Chair Training in Long Beach**

Tuesday, 6/27, 11:15 AM – Noon, Room #202C, 2nd Level, in the Long Beach Convention Center. *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. **Location of Section Head Mailboxes & Free Wi-Fi Access at this Society meeting**

Mailboxes are located just outside ASHRAE Headquarters Office (Seaview Ballroom B & C – Lower Level (1<sup>st</sup> floor) – Hyatt Regency 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.

Wireless internet will be available in all meeting rooms at the Hyatt, Renaissance, and Long Beach Convention Center. ASHRAE will be working with the internet provider to

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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.

Hyatt & Renaissance Wi-Fi Access: PSAV High Speed is the network, ashrae2017 is password (case sensitive).

Long Beach Convention Center Wi-Fi Access: ashrae2017 is the network, longbeach is password (case sensitive).

### 3. RPM (Remote Participation Meetings) being held in Long Beach

The 12th RPM (Remote Participation Meeting) Capable Society Meeting, which allows some TC members to participate in the TC meeting from a remote location electronically, will occur in Long Beach and the following fifteen TCs have agreed to participate in this effort: TC 1.6, TC 1.10, TC 1.12, TC 2.1, TG2(HVAC), TC 5.8, TC 5.11, TC 6.9, TC 7.3, TC 7.9, TC 8.3, TC 9.2, TC 9.4, TC 10.3, and TC 10.6 – This represents a 25% increase over the number of TC's hosting RPM meetings in Las Vegas. A total of 43 RPM meetings will be hosted in Long Beach when you include project committee and other committee meetings. For comparison, a total of 38 RPM meetings were hosted in St. Louis last year at this time.

The chairs of those TCs participating should provide to their Section Head feedback on their RPM meeting experience before TAC meets on Wednesday morning, 6/28.

### 4. Name Badges

As offered in the past, members of TCs who are not registered for the Conference and plan to only attend TC meetings may receive a free, plain white name badge. The purpose of these badges is for TC members not registered for the Conference to be able to identify one another in meetings.

To receive your badge, please go to the ASHRAE Registration desk located in room 104 at the Long Beach Convention Center and look for the sign for "TC Badges." Please identify yourself as someone only attending committee meetings, not registered for the Conference, who would like a white name badge. An ASHRAE staff person will create a badge for you that includes your name, company name and city, state and country (if outside the U.S.). The badge will not have a QR code and will not allow you into the Technical Program.

However, if you'd like to register for the entire Conference you can do so in advance or onsite. We realize your time is limited, one-day registrations (\$270 for Members) are available as well as one-session registrations (\$70). If you wish to register for one day of the Technical Program you or one session, you can do so at the ASHRAE Registration desk. The One-Day option gives you access to the Virtual Conference which is viewable on-demand for 18 months. Questions? Contact [meetings@ashrae.org](mailto:meetings@ashrae.org).

## Announcements and Reminders for TC/TG/TRG & MTG Chairs LONG BEACH 2017

### 5. Retiring TC/TG/TRG/MTG 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).

## C. UPCOMING DEADLINES

### 1. **TC Activity Forms for the Long Beach Meeting are due to Your Section Head before Wednesday, 6/28/17**

*TC/TG/TRG Activity Feedback Form (Excel)* can be downloaded from the Technical Committee webpage under the "TC Forms and Documents" page - <https://www.ashrae.org/standards-research--technology/technical-committees/tc-forms-and-documents>. Section heads can also provide an electronic copy of the form if requested.

### 2. **Thank You Letters to Employers**

ASHRAE President – Tim Wentz– 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 2016-2017. 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.

### 3. **Seminar and Forum proposals for Chicago are due by Tuesday, August 1st, 2017.** Please visit the following site to submit your proposal:

<https://ashraem.confex.com/ashraem/w18/cfp.cgi>

For more information, go to: [www.ashrae.org/chicago](http://www.ashrae.org/chicago)

### 4. **2017-2018 Hightower Award & Service to ASHRAE Research Award Nominations by Friday, September 1st**

Nominations for the 2017-2018 *George B. Hightower Technical Achievement Award* are due to you Section Head by September 1, 2017. 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>

Nominations for the 2017-2018 *Service to ASHRAE Research Award* for TC volunteer efforts in research are due to RAC research liaison by September 1, 2017. 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>

## Announcements and Reminders for TC/TG/TRG & MTG Chairs LONG BEACH 2017

### 5. 2018 RPM (Remote Participation Meetings) Request for Chicago Meeting

ASHRAE has streamlined the process for requesting RPM meetings moving forward, which will allow us to confirm meeting information earlier in advance of the actual meeting dates.

The updated procedures are as follows:

- ALL committees that want to be considered for an RPM capable meeting in Chicago next January must turn in an ASHRAE Meeting Room Request Form for Chicago to the ASHRAE Meetings section.
- The request should include the reasons why you are requesting RPM meeting capability.
- RPM meeting requests for the upcoming Chicago Winter meeting should be submitted by Monday, October 2<sup>nd</sup> or sooner.
- Confirmation emails (verifying the requests) will be sent out in November 2017
- Requests received after the above date may not be accommodated due to high and growing demand for this service.

### D. REMINDERS

#### 1. 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>

#### 2. Request for each TC to briefly review ASHRAE Code of Ethics at start of meeting

See the following link for the latest version of the ASHRAE Code of Ethics:

<https://www.ashrae.org/about-ashrae/>

#### 3. Make a Special Effort to welcome new Members, and Visitors to TC meeting

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.

#### 4. 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)

## Announcements and Reminders for TC/TG/TRG & MTG Chairs LONG BEACH 2017

### 5. Is Your Committee Website up to Date?

If not, please ask your webmaster to at least post the latest minutes and the Long Beach 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. The new TC website template has greatly simplified the duties of the TC webmaster and this form of communication is critical to the efficient operation of your committee, and for attracting new members.

The recent conversion to a new TC website platform highlighted a couple areas where a refresher of the ASHRAE rules on website maintenance is warranted. First be aware that ASHRAE Products (i.e., handbook chapters, journal articles, final reports from research projects, etc.) cannot be published on your TC's website. It is very appropriate to post the title and scope of the product and then link the reader to the ASHRAE bookstore or other location on the ASHRAE site where the product may be purchased. Any possible exceptions to this rule must be sent through Steve Comstock for review and approval ([scomstock@ashrae.org](mailto:scomstock@ashrae.org)). The second issue involves timely posting of the draft minutes. Draft minutes (and final, approved minutes from the prior meeting) should be posted to your website (or otherwise distributed to the members) within 60 days after the meeting. Please ensure that your secretary and webmaster are aware of this deadline. To assist your secretary in understanding the procedures for taking and reporting minutes, a video has been developed and posted on the Technical Committees' Training page (<https://www.ashrae.org/standards-research--technology/technical-committees/tc-training-and-presentations>). On the same page, a video has also been posted for use by webmasters to learn about the procedures and schedule to maintain the new websites.

### 6. TC 2017-2018 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](mailto: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](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.

## Announcements and Reminders for TC/TG/TRG & MTG Chairs LONG BEACH 2017

- 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.

### E. RECENT ANNOUNCEMENT

#### 1. **RAC Prioritizing Research Topics Related to the Residential Sector**

Continuing in 2017-2018, 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.

#### 2. **CEC's Standing Request for Future Society Meeting Program Track Suggestions**

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 Atlanta 2019 winter 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](mailto:Giometti@ashrae.org)). You can also add your track suggestion in the "Comment" section of the TC Activity form for the Long Beach meeting.

#### 3. **CEC Always Seeks 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.



## Announcements and Reminders for TC/TG/TRG & MTG Chairs LONG BEACH 2017

### 4. The Professional Development Committee (PDC) is seeking ideas for new ASHRAE Learning Institute (ALI) courses.

The Professional Development Committee (PDC) is actively seeking ideas for new ASHRAE Learning Institute (ALI) courses. We need practical courses of broad interest to be presented as face-to-face seminars or short courses, instructor-led online courses and self-paced courses. Examples include courses with a focus on new technologies that need to be shared, fundamentals for engineers new to the discipline, standard applications that need explanation, and courses based on new design guides. Does your TC have a potential course idea?

Contact Karen Murray (ASHRAE staff) [kmurray@ashre.org](mailto:kmurray@ashre.org) or James Bochat (2016-17 PDC chair) [PDCchair@ashrae.net](mailto:PDCchair@ashrae.net) with your course ideas.

## F. CURRENT & UPCOMING ASHRAE CONFERENCE PROGRAMS

### 1. Long Beach Annual Conference - June 24 – June 28, 2017

Conference Website: <http://ashraem.confex.com/ashraem/s17/cfp.cgi>

Conference Program Chair: Ann Peratt Email: [ann.peratt@gmail.com](mailto:ann.peratt@gmail.com)

#### Program Focus at Long Beach Annual Conference

- i. Track 1: Fundamentals and Applications
- ii. Track 2: HVAC&R Systems and Equipment
- iii. Track 3: Refrigeration
- iv. Track 4: Building Life Safety Systems
- v. Track 5: Controls: Smart Building Systems and the Security Concerns as Technology Emerges
- vi. Track 6: Commissioning: Optimizing New and Existing Buildings and their Operation
- vii. Track 7: Net Zero Energy Buildings: The International Race to 2030
- viii. Track 8: Residential Buildings: Standards and Guidelines and Codes
- ix. Track 9: Research Summit

### 2. Chicago Winter Conference – Jan. 20 – Jan. 24, 2018

Seminar and Forum proposals for Chicago are due by **Tuesday, August 1, 2017.**

Conference Website: <https://ashraem.confex.com/ashraem/w18/cfp.cgi>

Conference Program Chair: Michael Collarin Email: [Michael.Collarin@parsons.com](mailto:Michael.Collarin@parsons.com)

#### Program Focus at Chicago Winter Conference

- i. Track 1: Systems and Equipment

## Announcements and Reminders for TC/TG/TRG & MTG Chairs LONG BEACH 2017

- ii. Track 2: Fundamentals and Applications
- iii. Track 3: Standards, Guidelines and Codes
- iv. Track 4: Earth, Wind & Fire NEW!
- v. Track 5: Transportation IAQ and Air Conditioning NEW!
- vi. Track 6: Tall Buildings
- vii. Track 7: Modeling Throughout the Building Life Cycle NEW!
- viii. Track 8: Heat Exchange Equipment
- ix. Track 9: Refrigerant Mini Track @ Expo\*
- x. Track 10: Residential Mini Track @ Expo\*

### 3. **Houston Annual Conference - June 23 – June 27, 2018**

Seminar and Forum proposals for Houston are due by **Friday, February 9th, 2018.**

Conference Website: [https://www.ashrae.org/membership--](https://www.ashrae.org/membership--conferences/conferences/2018-ashrae-annual-conference/call-for-papers)

[conferences/conferences/2018-ashrae-annual-conference/call-for-papers](https://www.ashrae.org/membership--conferences/conferences/2018-ashrae-annual-conference/call-for-papers)

Conference Program Chair: Cindy Moreno Email: [cindym@tmmechanical.com](mailto:cindym@tmmechanical.com)

#### Program Focus at Houston Annual Conference

- i. Track 1: HVAC&R Systems and Equipment
- ii. Track 2: Fundamentals & Applications
- iii. Track 3: District Energy and Cogeneration Plants NEW!
- iv. Track 4: Safeguarding our HVAC&R System NEW!
- v. Track 5: Residential: Modern Buildings in Hot & Humid Climates
- vi. Track 6: Professional Skills
- vii. Track 7: Research Summit
- viii. Track 8: HVAC&R Control Freaks NEW!
- ix. Track 9: HVAC&R Analytics NEW!

**G. OTHER UPCOMING WORKSHOPS, CONFERENCES AND EVENTS**

**1. 2017**

- i. **Building Simulation 2017** – Aug. 7 – Aug. 9, 2017 – San Francisco, CA USA –  
Contact: <http://www.buildingsimulation2017.org/>
- ii. **ISHPC2017** – Aug. 7 – Aug. 10, 2017 – Tokyo, JAPAN – Contact:  
<http://biz.knt.co.jp/tour/2017/ISHPC2017/congress.html>
- iii. **ASHRAE Building Performance Analysis Conference** – September 27-29, 2017  
– Atlanta GA, USA – Contact: <https://ashraem.confex.com/ashraem/bpa17/cfp.cgi>
- iv. **2<sup>nd</sup> ASHRAE Developing Economies Conference** – Nov. 10-11, 2017, Delhi,  
INDIA – Contact: <https://ashraem.confex.com/ashraem/de17/cfp.cgi>

**TC 4.1 Programs/Standards and Some Research Projects Discussion**  
**Long Beach, Monday, June 26, 2017**

Glenn Friedman, Program and Standards Chair

**PROGRAMS**

1. Request for Program Committee Chair or Co-Chair
2. Current Programs
  - a. Monday, June 26, 8:00 AM - 9:30 AM, Seminar 19, Changes to Heat Gain Tables in the Handbook Commercial Load Calculations Chapter 18, Sponsor: 4.1 Load Calculation Data and Procedures, 5.10 Kitchen Ventilation Chair: Jeff Stein, P.E., Member, Taylor Engineering, LLC, Alameda, CA.
    - i. RP-1742 Update to Measurements of Office Equipment Heat Gain Data: Experimental Approach and Results Overview  
Christian Bach, Ph.D., Associate Member, Oklahoma State University, Stillwater, OK
    - ii. RP-1742 Update to Measurements of Office Equipment Heat Gain Data: Data Analysis and Parametric Studies  
Omer Sarfraz, Student Member, Oklahoma State University, Stillwater, OK
    - iii. RP-1631 Update to Kitchen Appliance Heat Gain Data  
Rich Swierczyna, Associate Member, Fisher-Nickel, San Ramon, CA
3. Future Program, January 2018, Chicago, Submission Proposals Due August 1, 2017
  - a. Future Seminar Session Proposals
    - i.
  - b. Future Program Ideas
    - i. Atrium and large space load calculations, empirical case studies
    - ii. Ventilation and infiltration
    - iii. How Load Calculations Interact with Other ASHRAE Chapters
      - Weather
      - Infiltration
      - Building skin color
      - Ventilation
      - Fenestration, dynamic windows

**STANDARDS**

1. We reaffirmed our sponsored ASHRAE Standard 183-2007.
2. We reaffirmed our sponsored ASHRAE Standard 203-2014.

- 
- Track 1: Systems and Equipment  
Track Chair: Carrie Ann Crawford Email: [crawford.ashrae@gmail.com](mailto:crawford.ashrae@gmail.com)
  - Track 2: Fundamentals and Applications  
Track Chair: Kevin Marple Email: [kmarple@benzco.com](mailto:kmarple@benzco.com)
  - Track 3: Standards, Guidelines and Codes  
Track Chair: Corey Metzger Email: [corey.metzger@resource.com](mailto:corey.metzger@resource.com)
  - Track 4: Earth, Wind and Fire  
Track Chair: Ashish Rakheja Email: [ashish.rakheja@aeonconsultants.in](mailto:ashish.rakheja@aeonconsultants.in)
  - Track 5: Transportation IAQ and Air Conditioning  
Track Chair: Dimitris Charalambopoulos Email: [dimitris@ashrae.gr](mailto:dimitris@ashrae.gr)
  - Track 6: Tall Buildings

**TC 4.1 Programs/Standards and Some Research Projects Discussion**  
**Long Beach, Monday, June 26, 2017**

- Track Chair: Leticia Neves Email: [leneves@gmail.com](mailto:leneves@gmail.com)
  - Track 7: Modeling Throughout the Building Lifecycle  
Track Chair: Joseph Firrantello Email: [j.firrantello@gmail.com](mailto:j.firrantello@gmail.com)
  - Track 8: Heat Exchange Equipment  
Track Chair: Vikrant Aute Email: [vikrant@umd.edu](mailto:vikrant@umd.edu)
  - Track 9: Refrigerant Mini Track @ Expo  
Track Chair: Gary C. Debes Email: [gcdebes@verizon.net](mailto:gcdebes@verizon.net)
  - Track 8: Heat Exchange Equipment  
Track Chair: Gary C. Debes Email: [gcdebes@verizon.net](mailto:gcdebes@verizon.net)
- 

## ***Research PMS Reports***

### **RP 1729 Radiant Systems**

1. Reviewed the test chamber setup.
2. Internal load: electric panel on wall as radiant heat gain, and cylinder for convective load.
  - Discussed generating radiant gain from wall may not represent real world situation, and whether that may skew the results and dynamic heat transfer between surfaces. Atila responded that it is hard to calculate view factor with cylinder geometry, will need to use experiment to test the impact of different load generation mechanism.
  - With electrical panel on wall, radiant heat gain will be calculated, and convection heat gain will be total minus radiant gain.
3. Review the impact of air change rate on convective heat transfer coefficients. CFD study by Atila's visiting students. This is important to inform the testing of the combined radiant and air system. Atila has the paper ready for publication and will share it with the PMS.
4. HB method implemented in EnergyPlus is not capable of keeping constant temperature in the space, there is no "ideal radiant system". Chip proposed process to modify the HBM.
5. Manage to dehumidify the space and the concrete. Now the dewpoint is well controlled.
6. Discuss the capacity of the radiant panel and the intensity of load that the system can handle. Because the radiant panel area is relatively small, the surface temperature needs be low enough to remove heat gain.
  - Chamber capacity is about 7-8 W/ft<sup>2</sup> of load.
  - Discuss running the radiant temperature too low may skew the result and may not be representative of real world operation. Need to make sure the radiant panel surface temperature not lower than 60°F.
7. Discussed impact of airflow rate on the test. Radiant system has to run with air system. Need to determine the ventilation rate. Atila's paper may inform the test design.
8. Pilot comparison:
  - Will compare control to air temperature vs. operative temperature.
  - Radiant heat gain using the electric panel.
  - One chamber run air system, the other with radiant only.
  - Atila will send out the plan for the pilot test, and the PMS will review it. Between now and Chicago, Atila will report the pilot result.

### **RP 1742 Office Loads**

1. Seminar 19
2. Discuss project closeout.

TC 4.1 Programs/Standards and Some Research Projects Discussion  
Long Beach, Monday, June 26, 2017

RP 1816 Energy from Imaging Equipment

1.



Shaping Tomorrow's  
Built Environment Today

Attachment #3

### TC Sign-in Sheet

Meeting Info: TC-4.1 MAIN MTC Date: 6.26.17

Name	Affiliation	E-mail	Member (Voting, Corresponding, or Guest?)	YEA Member? (Yes/No)
LARRY SUN	tkisc	lsun@tkisc.com	VC	N
Donnis Wessel	TAS Section Head	dweesse149@gmail.com	No	No
JIM PEGUES	CARRER CORP	James.F.Pegues@carrier.utc.com	CORR MEMBER	N
Rolando Legarreta	Alegro Engineering	rlegarreta@alegro-engineering.com	Voting	N
Glenn Friedman	Taylor Engineering	gfriedman@ taylor-engineering.com	NV	N
LIAM BUCKLEY	IES. LTD.	LIAM.BUCKLEY@IESUE.COM	Guest	No
Steve Bruning	Newcomb & Boyd	sbruning@newcomb-boyd.com	✓	N
Rachel Spitler	Cyntergy	rspitler@cyntergy.com	Corresponding	✓
Jeff Spitler	OSU	spitler@okstate.edu	✓	N
Russ Taylor	United Technologies	taybrrol@utrc.utc.com	Corresponding	N

Name	Affiliation	E-mail	Member (Voting, Corresponding, or Guest?)	YEA Member? (Yes/No)
Som Shrestha	ORNL	shresthas@ornl.gov	NV	No
Chris Wilkins	CRB	chris.wilkins@crbusa.com	Voting	No
Dove Feng	Taylor Engineering	dfeng@taylor-engineering	Voting	No
Chip Barnaby	Consultant	chipbarnaby@gmail.com	Voting	No
Nicholas Harlow	Halton Company	nicholas.harlow@halton.com	Guest	Yes
Scott Hellendrung	Uponor	scott.hellendrung@uponor.com	Non voting	No
OMER SARFRAZ	OKLAHOMA STATE UNIVERSITY	sarfraz@okstate.edu	NO G	No
Manabe Nabar	Bright Power, Inc.	mnabar@brightpower.com	Guest	Yes
ISHA SHARMA	ORNL	sharma.i@ornl.gov	Guest	No
Liz Balke	Taylor Engineering	lbalke@gmail.com	no G	no

FRANCISCO. GOMEZ    CYPE SOFTWARE    FRANCISCO.GOMEZ@CYPE.COM    ~~NO~~ PCM    YES





Meeting Info: \_\_\_\_\_ Date: \_\_\_\_\_

[illegible]



## ASHRAE Technical Committee 4.1

*“Commitment to the ASHRAE Code of Ethics – In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity and respect for others, and we shall avoid all real or perceived conflicts of interests. (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>.)”*

### **Agenda for - TC4.1 Load Calculation Data & Procedures**

#### **Long Beach**

**June 26, 2017**

#### **TC4.1 Load Calculation Data and Procedures**

**Monday, 2:15 PM to 4:15 PM**

**Wilmore, Renaissance**

- |   |  |
|---|--|
| 1. Call to Order  | Bob Doeffinger   |
| 2. Roll Call  | Suzanne LeViseur   |
| 3. Introduction of Visitors   | Bob Doeffinger   |
| 4. Approval and/or Corrections to St. Louis Meeting Minutes   | Bob Doeffinger   |
| 5. Liaison Comments<br>Section Head<br>PEChapter Technology Transfer<br>PEResearch<br>YangHandbook<br>ALI/PDC<br>Standards Liaison<br>Staff, Research/Tech Services<br>TAC Chairman<br>Assistant Mgr. Standards | Dennis Wessels,<br>Harris Sheinman,<br>Prof. Xudong<br>David P. Yuill<br>James W. Bochat<br>James Dale Aswegan<br>Michael R. Vaughn<br>Michael R. Bilderbeck<br>Ryan Shauley |
| 6. Research Subcommittee Report<br>Co Sponsor Research TC9.6  | Rolando Legarreta  |
| 7. Programs Subcommittee Report   | Glenn Friedman   |
| 8. Standards Subcommittee Report  | Glenn Friedman   |
| 9. Handbook Subcommittee Report<br>Residential Chap 17<br>Non-Residential Chap 18<br>Updates to Handbook  | Chip Barnaby<br>Steve Bruning<br>Jim Pergues   |



## ASHRAE Technical Committee 4.1

10. ASHRAE Website for TC4.1	Jim Pegues
11. Old Business	Bob Doeffinger
12. New Business	Bob Doeffinger
13. Adjournment	Bob Doeffinger

### Officers and voting members for 2016/2017:

Robert Doeffinger	Chair	Voting
Larry Sun	Vice Chair	Voting
Suzanne LeViseur	Secretary	Voting
Steve Bruning	Handbook Subcommittee Chair	Voting
Glenn Friedman	Standards/Programs SubC Chair	Nonvoting
Rolando Legarreta	Research Subcommittee Chair	Voting
Chris Wilkins		Voting
Jeff Spitler		Voting
Charles Barnaby		Voting
Jingjuan Feng		Voting
Elyse Malherek		Voting



# ASHRAE Technical Committee 4.1

## Meetings

### **TC 4.1 Load Calculation Data and Procedures**

Monday 2:15pm-4:15pm  
Wilmore, (R-2)

### **TC 4.1 Handbook Subcommittee**

Sunday 3:00pm-4:00pm  
Bixby 2, (R-2)

### **TC 4.1 Research Subcommittee**

Sunday 4:00pm-5:00pm  
Bixby 2, (R-2)

### **TC 4.1 Programs & Standards Subcommittees**

Sunday 5:00pm-6:00pm  
Bixby 2, (R-2)

### **RP-1729 Project Monitoring Subcommittee**

#### **Radiant Cooling**

Sunday 8:00am-9:00am  
Alford, (R-2)

### **RP-1742 Project Monitoring Subcommittee**

#### **Updates to Measurements of Office Equipment Heat Gain Data**

Sunday 6:00pm-7:00pm  
(Bixby 2 Renaissance)

## **Seminar 19**

Changes to Heat Gain Tables in the Handbook

Commercial Load Calculations, Chapter 18

Monday 8:00am-9:30am  
LBCC, Room 201A