Final - MINUTES June 30, 2015

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

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

TC/TG/TRG No. 6.8 Date 2015

TC/TG/TRG TITLE: Geothermal Heat Pump and Energy Recovery Applications
DATE OF MEETING: June 30, 2015 LOCATION: Atlanta, GA

<table>
<thead>
<tr>
<th>Members Present</th>
<th>Year</th>
<th>MEMBERS ABSENT</th>
<th>Year</th>
<th>EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE</th>
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<tbody>
<tr>
<td>(Donald) Cary Smith (Chair)</td>
<td>12-16</td>
<td>Trey Austin</td>
<td>14-18</td>
<td>Corresponding Members</td>
</tr>
<tr>
<td>Chris Gray (VC,H-9)</td>
<td>13-17</td>
<td>Michel Bernier</td>
<td>14-18</td>
<td>Carl Huber (RAC)</td>
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<td>Dave Dinse (MNQ-V)</td>
<td>12-16</td>
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<td>Keith Swilley</td>
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<td>Steve Kavanaugh</td>
<td>13-17</td>
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<td>Pat Goethel</td>
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<td>Jeff Spitler</td>
<td>12-16</td>
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<td>Kay Thrasher</td>
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<td>Howard Newton</td>
<td>14-18</td>
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<td>Bill Murphy</td>
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<td>Xiaobing Liu</td>
<td>14-18</td>
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<td>Jeff Warther</td>
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<tr>
<td>Lisa Meline (Standards)</td>
<td>14-18</td>
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<td>Chuck High</td>
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<td>Jeremy Fauber</td>
<td>12-16</td>
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<td>Dennis Koop</td>
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<td>Stephen Hamstra</td>
<td>13-17</td>
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<td>Mike Filler</td>
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<td>Members calling in</td>
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<td>Steve Carlson</td>
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<td>Gary Phetteplace</td>
<td>12-16</td>
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<td>Mike Green</td>
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<tr>
<td>Scott Hackel (S,Hbk-34)</td>
<td>11-15</td>
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<td>Bruce Baccei</td>
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<td>Ed Lohrenz (MNQ-V)</td>
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<td>Chuck Hammock</td>
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(12 Voting; 2 Voting-NQ)

DISTRIBUTION - ALL MEMBERS OF TC/TG/TRG

TAC Chairman: Walter Grondzik
TAC Section Head: Mark Hegberg
ALI/PDC: Hugh McMillan, III

LIAISONS

RAC Research: Stephen Hancock
Chapter Technology Transfer Committee: Maggie Moninski
Special Publications: Francis Mills
Standards: Cyrus Nasseri
Handbook: Patrick Marks
MANAGER OF RESEARCH/TECHNICAL SERVICES: Michael Vaughn
MANAGER OF STANDARDS: Stephanie Reiniche
MINUTES

Pursuant to an announcement sent to all members, ASHRAE Technical Committee TC 6.8, Geothermal Heat Pump and Energy Recovery Applications, met on Tuesday, June 30, 2015 at 3:30 PM in Atlanta, GA. The meeting was held in conjunction with the ASHRAE 2015 Annual Meeting.

I. CALL TO ORDER, WELCOME, INTRODUCTIONS
Chair Cary Smith called the meeting to order at 3:41 PM. The Chair welcomed everyone. Members, guests, and ASHRAE Committee liaisons were requested that they introduce themselves. The importance of YEA was noted, and a count of 3 YEA members present was made. The Chair requested that the sign-in sheet be filled out completely, and that attendees check their information on the roster sheet and make any changes through ASHRAE’s website.

II. QUORUM CHECK
Fifty percent of the voting members of the technical committee, present in person, constitute a quorum for the transaction of business. The Chairman read the list of voting members to confirm that the roster was correct. The roll call revealed that nine (9) of fourteen (14) Quorum members of the technical committee were present, and two (2) additional Quorum members were attending remotely via teleconference. A quorum was available to conduct committee business.

III. APPROVAL OF MINUTES
The Secretary distributed copies of the minutes of the January 27, 2015 Annual Meeting in Chicago, IL and the Chair requested that members review them.

MOTION: Lisa Meline moved that the Minutes of the TC 6.08 meeting in January 2015 be accepted as presented, and the motion was seconded by Jeremy Fauber. The Motion carried and the minutes were approved (11-0-0-CNV).

IV. ANNOUNCEMENTS FROM ASHRAE

A. Research
   a. RAC Liaison, Harvey Sachs will be rolling on for Steve Hancock
   b. There is a new linkage between progress payments and project milestones. Once milestones are met, and PMS approves, the payment will be released by MORTS.
   c. RAC Liaison wants to be involved in reviewing RTARs and work statements to advocate for RAC.
   d. It’s not inappropriate for potential bidders to be involved in the development of an RTAR.

V. ANNOUNCEMENTS FROM THE CHAIR

A. Cary Smith reported on the Chairs’ breakfast.
   a. Email alias system is being fully rolled out next year
   b. RAC is prioritizing residentially-focused research projects
   c. ASHRAE offers to send a Letter to the employers of TC members
   d. Reminder to update your ASHRAE Bio
   e. Added online input form for disciplines
f. ASHRAE is requesting to find new ways to add new members
   g. Potentially will add new program for this committee to mentor potential new members
       with a shadowing role of an existing member

B. Recognitions
   a. Chris Gray has completed his PhD

VII. SUBCOMMITTEE REPORTS

A. Handbook - Scott Hackel/Chris Gray
   a. Geothermal Energy Utilization
      1. The Chapter 34 handbook meeting was not held at the Atlanta meeting. It
         will be held via email following the meeting.
   b. Applied Heat Pumps and Energy Recovery
      1. Chapter 9 revisions were approved via an email vote in March.
   c. Both chairs are looking for replacement as they move to other roles
      1. Chris Gray to email corresponding members asking for Handbook Chair
         volunteers

B. Standards – Lisa Meline – subcommittee meeting was held June 30
   a. Chuck High update on Std. 194: MOT for DX Heat Pumps
      1. Will meet in January, members are ready, waiting on approval of committee
         from ASHRAE
      2. Joe Parsons is Chair
      3. Written reports to come from Lisa
   b. CSA 448
      1. Ballot vote taken, need to revise some final issues
      2. Should be completed by end of summer
   c. Lisa has also been asked to be the Standards Chair for IGSHPA

C. Programs - Michael Kuk - subcommittee meeting was held on June 28
   a. Atlanta
      1. Had 1 seminar this meeting, field results of different ground-source
         approaches
   b. Orlando
      1. July 6th is the deadline for conference papers
      2. August 10th is the deadline for seminars, forums, and workshops
      3. January 4th is the deadline for submittals
      4. Central vs Decentralized Design: Mike Filler to Chair
         i. Speakers: Filler, Xiaobing, Kavanaugh
      5. CSA 448: Lisa Meline to Chair
         ii. Speakers: Cary, Kirk, Lisa
      6. Ultra-Deep Boreholes: Cary Smith to Chair
         iii. Speakers: TBD
   c. St. Louis
      1. Planned submissions:
         iv. Conference Paper: Design criteria for PV/GSHP (paper)
            (Zheng onceil- U of Alabama)
d. Changes to program processes:
   i. Starting in St. Louis, process in place for inviting speakers to have their speaker fees waived.
   ii. Starting in St. Louis, speakers will be asked to fill out a potential sources bias disclosures document that will note an affiliation/involvement with any organizations with financial or commercial interest in the subject matter to be discussed.
   iii. Talk of first strike/second strike penalties for speakers not meeting upload deadlines for commercialization review.
   iv. Beginning Orlando, ASHRAE developing multiple presentation templates, and recommend use.

D. Research - Xiaobing Liu - subcommittee meeting was held June 28
   a. RTAR 1752
      1. Plan was too narrow
      2. Forming a MTG to rewrite RTAR
      3. Many TCs have already agreed to join the MTG
   b. RP-1585
      5. Vote on final report: less than 2/3 approval. Acceptance did not move forward.
   c. New Research Ideas
      6. Installation costs remain an important desire of the industry
   d. We have a request from O&M group for TC 6.8 representation
      7. Chris Gray volunteered

E. Membership - Gary Phetteplace
   a. Ed Lohrenz, Scott Hackel rolling off now
   b. Kirk Mescher rolling on (MNQ), Mike Filler rolling on, Michael Kuk rolling on
   c. This will increase membership by one; doesn’t change simple quorum

F. Education and Special Publications/Journal - Roxanne Scott
   d. No report given.

G. Webmaster - Mike Filler
   e. No report given.

VIII. LIAISON REPORTS
A. ALI COORDINATOR – David Pleasants
   a. David Pleasants was not present; no report was made.

B. IGSHPA – Lisa Meline
   a. No report.

C. NGWA – Cary Smith
   a. No report.

D. RAC – John Shonder
   a. John Shonder was not present; no report was made.
B. YEA – Chris Gray
   a. No report.

IX. OLD BUSINESS
A. ASHRAE FAQ
   a. Assigned to TC 6.8; Chris Gray to lead.
   b. No new FAQ

X. NEW BUSINESS
A. None raised

XI. ADJOURN
A. MOTION to adjourn the meeting. Motion carried (11-0-0-CNV).

XII. Special presentation by Chuck Hammock following meeting.

Eleven pages of attachments follow:

1. Committee Assignments as of June 30, 2015
2. Program Subcommittee Report
3. Research Subcommittee Report
5. Standards Subcommittee Report
6. ASHRAE Meeting Report
7. Post-meeting activity, votes, etc.
Committee Assignments (2014-2015)

Programs:
  M. Kuk (chair)
  L. Meline
  C. Smith
  K. Thrasher
  F. Pucciano
  J. Spitler

Research
  G. Phetteplace
  D. Dinse
  S. Hackel
  B. Koschka
  C. Remund
  Stephen Hamstra
  Mike Filler
  X. Liu (chair)

Handbook Ch. 9:
  C. Gray (chair)
  C. Paraskevakos
  E. Lohrenz
  M. Filler
  F. Pucciano
  G. Phetteplace
  C. Haynes

Handbook Ch. 34:
  S. Hackel (chair)
  M. Kuk
  J. Fauber
  M. Bernier
  A. Chiasson
  M. Green
  X. Liu
  K. Rafferty
  K. Mescher
  C. Smith
TC 6.8 Subcommittee Report: Programs
Subcommittee Chair: Michael Kuk
Date: Sunday, June 28, 2015

Minutes from the subcommittee meeting can be found below.

TC 6.8 PROGRAMS MEETING MINUTES: ATLANTA, GA

PROGRAMS MEETING MINUTES

Programs Committee

<table>
<thead>
<tr>
<th>Michael Kuk</th>
<th><a href="mailto:mkuk@ceresolutions.com">mkuk@ceresolutions.com</a></th>
<th>630-631-5483 (cell)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cary Smith</td>
<td><a href="mailto:dcsmith@sounder.co">dcsmith@sounder.co</a></td>
<td>803-342-6200</td>
</tr>
<tr>
<td>Lisa Marine</td>
<td><a href="mailto:lma@marine.com">lma@marine.com</a></td>
<td>916-555-5489</td>
</tr>
<tr>
<td>Key Thresher</td>
<td><a href="mailto:key@evansandengineering.com">key@evansandengineering.com</a></td>
<td>423-855-3184</td>
</tr>
<tr>
<td>Frank Porciano</td>
<td>frank.porciano@ashe</td>
<td>713-531-5853</td>
</tr>
<tr>
<td>Jeff Spiller</td>
<td><a href="mailto:spiller@chstate.edu">spiller@chstate.edu</a></td>
<td>405-774-5500</td>
</tr>
</tbody>
</table>

1) Chicago Meeting: We had a seminar and technical tour related to Walgreens Pursuit of a Net-Zero Store. I have not seen the survey of results but room was packed and tour sold out.

2) Atlanta Meeting: We had one seminar, and one co-sponsored seminar.
   b. Seminar 42 (co-sponsored with TC 6.7) “GSHP and Solar Together”. Speakers: Cary Smith, Gaylen Atkinson, Great seminar as well.

3) Recent rejected sessions:
   b. (Chicago) Forum: EPA 111D (Carbon Reduction) “What impact will this have on energy efficient design?” Chair: Chris Giry.
   c. (Atlanta): How to design ultra-deep boreholes – superdude pipe collapse (Submitted by Cary)

4) Next Meeting Location(s)
   Annual 2016 – St. Louis, Missouri June 25-29, 2016

Key next dates:
July 6, 2016: Conference Papers (Orlando)
August 10, 2016: Seminar, Forum, and Workshop proposal are due (Orlando)
September 14, 2015 – Conference Paper abstracts due (St. Louis)
December 4, 2015: Confex opens for presentation uploads (Orlando)
January 4, 2016: All presentations due on-line (Orlando)
Jan 4, 2016: Conference papers (St. Louis)

Orlando Conference Tracks
Track 1: Systems and Equipment
Track 2: Fundamentals and Applications
Track 3: Design Build
Track 4: International Design
Track 5: Standards, Guidelines and Codes
Track 6: Cutting Edge Technologies
Track 7: The Great Debate
Track 8: Modern Residential Systems

St. Louis Tracks
Track 1: Advances in Refrigeration Systems and Alternative Refrigerants
Track 2: Research Summit
Track 3: Fundamentals and Applications
Track 4: HVAC Systems and Equipment
Track 5: Smart Building Systems/Remote Monitoring and Diagnostics

5) PLANNED SUBMISSIONS FOR ORLANDO
   a. Track 7: Central Plant Design: Central vs. Unitary Mike Filner – chair (Kivimaki) distributed point of view, Steve Hansen. Central Point of View. “How to tie it together.” = possibly a third speaker (Xochita)
   b. Track 3: CSA 418, codes and standards, adoption and hybrid systems. Lisa/Kirk, and Cary present (Lisa Chair)
   c. Cary restricted workshop on how to design ultra-deep bore holes (Chair)

6) PLANNED SUBMISSIONS FOR ST. LOUIS
   a. Conference Paper: Design criteria for PV/GSHP (paper) (Zhang need - U of Alabama)

7) Changes, New News:
   a. Starting in St. Louis, process in place for inviting speakers to have their speakers fees waived.
   b. Starting in St. Louis, speakers will be asked to fill out a potential sources bias disclosures document that will now an affiliation/involvement with any organizations with financial or commercial interest in the subject matter to be discussed
TC 6.8 Subcommittee Report: Research
Subcommittee Chair: Xiaobing Liu
Date: Sunday, June 28, 2015

Minutes from the subcommittee meeting can be found below.

- **Status of 1385 RP:** Voting members (VM) of TC 6.8 voted on 2/20/2015 on the original motion of "Accept the PMS majority vote to accept the product of 1385 RP." The result of the vote is 8-6-0-1 CNV. Since less than 2/3 of VM voted yes, according to the related rules of ASHRAE, the motion FAILS. So, the final report of 1385 RP is thus not accepted by TC. The research chair will communicate with the PMS and the PI of 1385 RP to work out specifications for the needed revisions for the final report.

- **Status of RTAR-1752:** The referred RTAR was rejected by RAC on 2/17/2015 with following consensus comments and questions: (1) the proposed research is too specific/narrow if limited to GSHP. It should encompass all technologies. (2) Is the proposed work within ASHRAE’s scope if it gets into generation issues? (3). applies beyond GSHPs to HPs of all equipment types. Appropriate topic for a Multidisciplinary Task Group (MTG) to tackle, with participation from TC 6.8, TC 8.7, TC 8.11, etc? Greater TC participation would also help justify higher project budget.

  Based on these comments and discussions within TC 6.8, the authors of this RTAR (Cary Smith and Xiaobing Liu) decided to form a Multi-disciplinary Task Group (MTG) and develop a new RTAR with the MTG. The formation of MTG.ASEC (Avoided Source Energy Consumption Due to Waste Heat Recovery and Heat Pump Technologies) was approved by TAC in Atlanta on 7/1/2015. Representatives of several TCs have joined the MTG.ASEC, including TCs 2.8, 4.7, 5.5, 6.2, 6.8, 6.9, 7.4, 7.6, and 8.7. Michael Vaughn from ASHRAE will introduce the formation of MTG.ASEC and invite TCs to contact him if they wish to have a voting representative on this MTG. It is planned to have a kick-off web meeting for this new MTG in 1-2 month.

- **IGSHPA is looking for members for its research committee. The research committee needs 5 voting members and the voting members shall have IGSHPA membership.**

- **New research ideas:**
  - Long term performance of ground heat exchanger study should be expanded (Kavanaugh).
  - Improved controls for variable speed pumping and optimization of DOAS (Xiaobing)

TC did not prioritize the above ideas and it appears that the new MTG is the focus for now.

News: Section liaison Steve Hancock will be rolled out and Harvey Sachs (from ACEEE) will be the new liaison.
TC 6.8 Subcommittee Report: Handbook
Subcommittee Chair:
Date:

Minutes from the subcommittee meeting can be found in the attachment below.

There were no handbook meetings held in Atlanta.
TC 6.8 Subcommittee Report: Standards
Subcommittee Chair: Lisa Meline
Date: June 30, 2015

Minutes from the subcommittee meeting can be found below.

BSR/CSA C448 Bi-national standard for the Design and installation of ground source heat pumps for commercial and residential buildings

Collaborative effort between CSA, ASHRAE, IGSHPA, NGWA and GEO.

Project is behind schedule due to comments received during the balloting process from NGWA and others in February which required committee resolution to move forward. Main issues were definitions/nomenclature, grouting, and piping references. For example, terminology agreed to by all committee members is “vertical borehole heat exchanger [field]” in lieu of bore, borefield, well field, etc.

Standard 194 – Method of Test for Direct Expansion Ground Source Heat Pumps

TC6.8 voted to update the standard and nominated Joe Parsons to Chair the Committee responsible for updating the Standard. The current members include:

Joe L Parsons Jr. EarthLinked Technologies, Inc.
Mr. Charles High High Dynamics
Mr. Christopher G Stone AHRI
Dr. William E Murphy PE PhD University of Kentucky
Greg Polk Danfoss
Mr. Jack Zarour SPLS Liaison

If others wish to participate as committee members please contact Joe Parsons directly (jparsons@earthlinked.com) so he can submit their applications to ASHRAE for review.

In April of 2015 the Committee received confirmation from ASHRAE that all the necessary membership documents had been received. Due to delay caused by one committee member who failed to revise his bio by the deadline the committee has been forced to delay the first official meeting until the 2016 Winter meeting.

The ASHRAE 194 Standard revision process has moved forward only slightly. The committee met unofficially in Chicago (January 2015) and created a work plan and an overview of the proposed revisions to the Standard. Chuck High is at this meeting continuing the discussions in Joe’s absence.

2015 Uniform Solar Energy and Hydronics Code (IAPMO)

The USEHC Report on Comments (ROC) will be distributed to all TC members by March 24, 2015. There will call for comments from the membership and public on March 25, 2015 and the deadline for all comments is June 1, 2015. All comments received will be sent for balloting on June 16, 2015. The final closing date for ballots is July 3, 2015. All ballot results and actions will be sent to the TC and posted on the web by August 8, 2015. The 2015 USEHC is scheduled for publication by September 1, 2015.

Through IGSHPA, an attempt to correct life safety and technical concerns with this Code were communicated to IAPMO. We were not successful in making changes for the 2015 Code cycle. This is a geothermal industry issue and it will require attention by all organizations to correct: ASHRAE, IGSHPA, GEO, NGWA, etc.
IGSHPA recently restructured and has asked me to serve as Standards Committee Chair for their organization. Since I also serve as Standards Subcommittee Chair for TC6.8, I will also be asking for assistance from IGSHPA and TC6.8 voting and corresponding members who have expertise in various topics being addressed by the USHEC Code.

**ASTM E4415 – Installation, Testing, Commissioning, and Maintenance of Closed Loop, Ground Source Geothermal Heat Exchanger.**

No progress to report on this standard.

**Action Items:**

I will follow up with the ASHRAE Standards on two items discussed during the full committee meeting.

- IAPMO USHEC
- ISO/ANSI/ASHRAE 13256-1 and 13256-2
## 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 Chair by email or drop off a printed copy in the Section Chair’s mailbox folder outside the ASHRAE Headquarters room. Include activities performed since the last TC meeting (e.g., any letters, bulletins, submissions to RAC, award nominations, etc.).

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

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<tr>
<th>TC (0.08)</th>
<th>Committee Name:</th>
<th>Geothermal Heat Pump and Energy Recovery Applications</th>
<th>Chair:</th>
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### Meeting was Held (City) | Atlanta | (Day) | Tuesday | (Date) | 6/30/2015 |

### Membership

| Voting Members (excluding Non-Quorum Members) | 10 | 3 | 13 |
| Non-Quorum Members | 1 | 1 | 2 |
| Corresponding Members | 10 | 0 | 10 |
| Provisional Members | 0 | 0 | 0 |
| Visitors/Guests | 6 | 0 | n/a |
| All members/guests who are also YEA members | 3 | 0 | 3 |

### Handbook Responsibilities

| Total Number of Chapters | 2 |

### Standards Responsibilities

| # Standards recommended | 0 |

### Special Publications (last six months)

| # | Title |

### Program Activities (For This Meeting)

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### Current Research Activities (active)

| # of new/revised RTARs submitted | 0 |
| # of other active RTARs | 1 |
| # of Work Statements submitted | 0 |
| # of other active Work Statements | 0 |
| # of active TRPs | 0 |
| # of active RFS | 0 |
| Problems getting RTAR/WS approved | N/A |

### TC Management

| Minutes completed on time? | Yes | Agenda distributed on time? | Yes | Did Chair attend training? | Yes | Did Vice Chair attend? | Yes | Did Program Chair attend training? | Yes | Did Handout Chair attend training? | Yes | Did Research Chair attend breakfast? | Yes |

### Other Technical Activities

| # FAQs updated this meeting | 0 |
| # of new members added to roster | 1 |

### Award Nominations (last six months)

| # of Distinguished Service Nominations | 0 |
| # of Exceptional Service Nominations | 0 |
| # of Other Nominations: Hightower, Research, Fellow, etc. | 0 |

### Any Concerns or requests for the Technical Activities Committee? (Please type in Space Below)

We will be pursuing the formation of an NTTC to respond to concerns with RTAR/WS. We could use your assistance in setting up this NTTC.

* For submitted sessions, include only sessions which your TC initiated and submitted for this meeting.
** Papers from TC in sessions not sponsored by TC.
Post-meeting activity, votes, etc.

No significant post-meeting activity as of this writing.