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**TC/TG/MTG/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/MTG/TRG No. TC 6.9 DATE July 25, 2016

TC/TG/MTG/TRG TITLE Thermal Storage

DATE OF MEETING Monday, June 27, 2016 LOCATION St. Louis, MO

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Geoff Bares	2015	Harshal Upadhye	2012	Brian Silvetti - CM
John Lau	2013	Larry Markel	2015	John Andrepont – CM
Jeff Kane	2014			John Dunlap - CM
Scott Shaffer	2012			Guy Frankenfield - CM
Henry Becker	2013			Ivan Thomas - CM
Chris Mincey	2014			Michael Deru – CM
Mark MacCracken	2013			John Nix - CM
Blake Ellis	2015			Farzin Rad - CM
Ken Fulk	2015			Zidu Ma - CM
RPM - Paul Steffes	2012			Jia Huang - CM
				Paulo Tabares - CM
				Houjun Yang - CM
				Verle Williams - CM
				Charles Upshaw - CM
				Trent Hunt - CM
				Jim Early – G
				Dolaana Khovalyg - G
				Wei Zhou - G
				Zhigang Xu - G
				Mikelann Scerbo - G
				Cameron Wise - G
				Tim Anderson - G
				John Willden - G
				Dharam Punwani - CM
				RPM – Dan Pyewell - CM
				RPM – Steve Reigh - CM

**DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:**

TAC Section Head: Mark Hegberg	SH6@ashrae.net
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All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	Lynn Werman - Handbook Liaison Dr. Harvey Sachs – Research Liaison Cyrus Nasserri – Standards Liaison
Mike Vaughn, Manager Of Research & Technical Services	MORTS@ashrae.net

# ASHRAE TC 6.9 - Thermal Storage - General Meeting Minutes

Monday, June 27, 2016

4:30 - 6:00 PM

Room 130, America's Convention Center Complex

St. Louis, MO

1. Preliminaries
  - a. The meeting was called to order at 4:32 PM by Geoff Bares, Chair.
  - b. The Purpose Statement is posted on the TC 6.9 webpage and was read aloud by the Chair.
  - c. Everyone in attendance (including guests) was given the opportunity to introduce themselves.
  - d. Roll call was taken and 10 of the 14 voting members were present including the Chair. Quorum was established.
  - e. No modifications to the agenda were suggested.
2. Approval of Minutes
  - a. The minutes from the Winter Meeting in Orlando, FL were posted on the TC 6.9 website within 60 days of that meeting, and available to all members.
  - b. John Andrepont made a correction to the minutes and the error was addressed.
  - c. Blake Ellis made a motion to approve the minutes. Chris Mincey seconded the motion. The motion was approved unanimously by a vote of 9-0-0-CNV.
3. Announcements by Chair – Geoff Bares
  - a. The Chair reported on the Section 6 Breakfast Meeting.
    - ASHRAE is developing infrastructure to utilize a standard tool (Basecamp) to share files within members of committees. More information on the file sharing method will be provided at future meetings.
    - The Conferences and Expositions Committee (CEC) will institute a three-strike policy if presentations are not uploaded for ASHRAE Society review in time. More information on the penalty for getting three strikes will be provided in the future.
    - ASHRAE continues to encourage the utilization of Remote Participation Meetings (RPM) to increase participation. TC 6.9 initiated remote participation with this meeting.
4. Liaison Reports
  - a. Section 6 TC Section Head – Mark Hegberg was not present
  - b. Professional Development Committee – John Nix
    - John Nix joined the meeting during a later agenda item. TC 6.9 circled back to this item when he arrived.
    - TC 6.9 has a Thermal Energy Storage (TES) short course developed with help from Doug Reindl. Mr. Nix is working with the Professional Development Committee to place the TES short course on the committee's agenda for consideration to sponsor the course.
    - The Professional Development Committee has an upcoming teleconference. It is possible that the committee may approve the TES short course for either the Summer 2017 Long Beach, CA conference, or even the Winter 2017 Las Vegas, NV conference.
  - c. ASME PTC 53 – John Lau
    - PTC 53 was formed to create standards for TES. The committee has determined that many other industry societies, such as the Institute of Electrical and Electronics Engineers (IEEE), the National Electrical Manufacturers Association (NEMA), ASHRAE, and the Air-conditioning, Heating, and Refrigeration Institute (AHRI), already have standards for TES. In particular, ASHRAE and AHRI handle the mechanical HVAC side of the TES standards.
    - PTC 53 agrees that ASHRAE and AHRI should handle the mechanical HVAC TES standards. Instead, PTC 53 is focusing its standards attention on molten salt, flywheel, and compressed air technologies. The committee welcomes any support or suggestions for standards development.
    - The ASME Power & Energy Conference took place during the ASHRAE meetings from June 26-30, 2016. A presentation on June 28, 2016 will be made at the Hilton Charlotte Center City Hotel.
  - d. MTG.ASEC (Avoided Source Energy Consumption) – Mike Filler was not present, Guy Frankenfield reported
    - **Mike Filler is no longer available to serve in this liaison role.**
    - Guy Frankenfield attended the MTG meeting and agreed to serve as liaison for TC 6.9. He provided the report.
    - The work statement (WS) has been submitted. The WS is titled "Avoided Source Energy Consumption Due to Waste Heat Recovery and Heat Pump Technologies." The MTG is awaiting comments from the Research Administration Committee (RAC).

5. Handbook – Farzin Rad

- a. Chapter 51 of the 2016 HVAC Systems & Equipment Handbook is complete. A new four-year cycle has begun.
- b. **Action: Members are encouraged to read Chapter 51 to find any areas for improvement and raise suggestions for edits or additions to the next edition.**
- c. Members noted that some of the following edits may be considered for the next edition:
  - Incorporate comments from the ASHRAE editorial staff
  - Include items that did not make it into the latest revision
  - Add to the renewables section using the information generated from the University of Wisconsin research project (RP-6017)
- d. Once the topics to address have been collected, Farzin Rad will show the list to members and ask for volunteers to assist in the next revision.
- e. ASHRAE has created a tool so that members can edit chapter text files simultaneously. This tool can be accessed at <authoring.ashrae.org>.
- f. ASHRAE praised TC 6.9 for being one of the few committees who made some major updates to their respective chapter in the Handbook.

6. Programs – Chris Mincey

- a. Review of past programs (Orlando, FL – Winter 2016)
  - “Integrating Cutting-Edge Technology: Renewable Energy and Thermal Energy Storage” was presented in Orlando, FL by Mark McCracken, John Andrepont, Douglas Reindl and Paul Steffes. The reviews received on the presentation were very positive, average at a 4.4/5 rating.
- b. Current Programs (St. Louis, MO – Summer 2016)
  - At the Orlando, FL conference, TC 6.9 approved to submit the seminar proposal titled “Automated Thermal Energy Storage Controls”. However, the moderator could not secure speaker commitments and postponed submission.
  - TC 6.9 did not sponsor any programs in St. Louis, MO by itself. However, TC 6.9 partnered with TCs 8.3, 6.2, and 9.8 to cosponsor a seminar titled “Heat and Cooling with Woody Biomass for Sustainable and Resilient Buildings and Communities” on Tuesday, June, 28, 2016 at 11:00 AM CT.
  - TC 6.2, District Energy, will host a forum titled “To Centralize or Decentralize a Thermal Energy System: The Great Debate Continues” on Wednesday, June 29, 2016 at 9:45 AM CT.
- c. Future Programs (Las Vegas, NV – Winter 2017)
  - The committee is interested in proposing a seminar on the fundamentals of TES. Geoff Bares, Mark MacCracken, and Guy Frankenfield agreed to participate in the seminar and Chris Mincey agreed to moderate. Chris Mincey made a motion to submit the seminar proposal titles “TES 101: The Basics”. The motion was seconded by Scott Shaffer and approved unanimously by a vote of 9-0-0-CNV.
  - As discussed earlier, John Nix is working with the Professional Development Committee to offer a four-hour short course on TES, possibly as early as Las Vegas.
  - Members considered cosponsoring a seminar titled “Enhancing Resiliency in Critical Applications” with TC 6.2, District Energy. The topic would fit well in the critical operations track. TC 1.10, Cogeneration Systems, may also be interested in cosponsoring. Each of the three TCs would provide one presenter for the seminar. Guy Frankenfield volunteered to represent TC 6.9 at the seminar. Tim Anderson volunteered to moderate the seminar. Chris Mincey made a motion to cosponsor the seminar proposal with TC 6.2. The motion was seconded by Ken Fulk and approved unanimously by a vote of 9-0-0-CNV.
- d. Future Programs (Long Beach, CA – Summer 2017)
  - There is a residential track at the Long Beach, CA conference. Members suggested proposing a workshop on TES used in residential applications.
  - There are also general tracks available at the Long Beach, CA conference. Guy Frankenfield and John Lau volunteered to revive a seminar submittal that would focus on conserving energy and water using TES.
  - Members discussed cosponsoring a program with TC 7.5, Smart Building Systems, on incorporating TES into smart buildings. Members agreed to discuss this idea at the next meeting.
- e. Long Range & Technical Tours
  - John Nix and Chuck Dorgan would be willing to present on ASHRAE Standard 150, Method of Testing the Performance of Cool Storage Systems, for a future program. It may be useful to pair this program with when a new version of ASHRAE Standard 150 is published. Members agreed to discuss this idea at the next meeting.
  - The CEC is currently selecting tour sites for upcoming conferences. During the Chicago, IL Winter 2018 conference, members recommended touring Enwave Chicago or McCormick place for their TES systems. **Action: Members are encouraged to recommend tour sites involved TES systems for future conferences.**

7. Standards – Mike Filler was not present, Geoff Bares reported
  - a. Mike Filler is no longer available to serve as Chair for Standards. Ken Fulk volunteered to be the Chair for the Standards Subcommittee.
  - b. Standard 94.2, Method of Testing Thermal Storage Devices with Electrical Input and Thermal Output Based on Thermal Performance
    - The committee voted to withdraw this standard at the 2016 winter meeting. An update on the status of the withdrawal process will be provide at the next meeting.
  - c. Standard 150, Method of Testing the Performance of Cool Storage Systems
    - Members are interested in kick starting SPC 150 and completing the revision process. In the last update, the standard was reaffirmed.
    - Mike Filler had previously volunteered to chair SPC 150, but is no longer available to serve. Ken Fulk has agreed to serve as Chair.
    - Geoff Bares will consolidate the comments collected on ASHRAE Standard 150 in the active document being shared. The SPC plans to hold a web meeting in August or September to review the last comments and finalize the standard.
  - d. Other standards impacting TES:
    - Now that the entire 94 standards series has been withdrawn, ASHRAE has a field system test standard left and no device test standard. However, AHRI Standard 900 includes methods of tests in its appendices for different types of technologies for site and factory tests. AHRI Standard 900 also maps performance for TES. The latest version of AHRI Standard 900 is available for free on the AHRI website: <http://www.ahrinet.org/Standards/HVACR-Industry-Standards.aspx>. Members wondered how often AHRI Standard 900 is used. Mikelann Scerbo will provide information for a future meeting on how often Standard 900 is downloaded from the AHRI website, as well as a copy of an older version of AHRI Standard 900 that included water storage. Members are encouraged to consider joining AHRI.
    - TC 6.2, District Energy and TC 1.10, Cogeneration Systems are interested in the revision of Standard 100, Energy Efficiency in Existing Buildings because current metrics significantly penalize the application of district energy in retrofits. Alternative energy assessment criteria are under development by a SPC 100 working group.
8. Research – Brian Silveti
  - a. RP-1607 – Design and Utilization of TES to Increase the Ability of Power Systems to Support Renewable Energy Resources
    - The University of Wisconsin presented at the Research Subcommittee. They request a no cost extension until January 2017 at the Las Vegas, NV conference, at which time they would present the final report. The PMS unanimously granted the extension.
  - b. Work Statement (WS) 1716 - Design Guide for Cool Thermal Storage – Revision
    - The WS was submitted in May 2016. It was conditionally approved, but the committee is still awaiting comments.
  - c. RTAR-1762 - Design Guide for CTIC Systems - Co-Sponsoring with TC 1.10, Cogeneration Systems
    - This RTAR is similar to the design guide update for cooling TES.
    - The WS draft was received by Geoff Bares yesterday from the primary author, Dragos Paraschiv. Geoff Bares will return comments to Dragos, who will distribute the final draft to TCs 6.2, 6.9, and 1.10 for approval by letter ballot. Members hope to have the draft WS ready to submit by the August 15, 2016 deadline for research.
  - d. The committee was approached by TC 1.4, Control Theory and Application, about cosponsoring an RTAR involving controls for TES. The RTAR would involve individual buildings as opposed to districts or campuses. The RTAR will be reviewed once received.
  - e. ASHRAE is currently not accepting unsolicited research proposals (URP) for funding consideration while it works to revamp and better clarify the intent and purpose of the URP program/process.
  - f. Research projects can now reach \$200,000 of funding before being sent to the technical council.
  - g. The technical council has requested for RAC to look more into applied research.
  - h. ASHRAE has committed significant funds for flammable refrigerant research with the Department of Energy (DOE) and AHRI. This research initiative could have implications for TES downstream if it led to reducing refrigerant inventory onsite and chiller downsizing.

9. Long Range Planning/Website – Geoff Bares
  - a. Mike Filler is no longer available to serve as Webmaster. Dan Pyewell agreed to be the new Webmaster.
  - b. The committee would like to enhance the website content and generate more interest/usage from members. Members are encouraged to let Geoff Bares know if they have any content in mind to post to the website.
  - c. Section 6 discussed the concept of Technical Committees producing technical bulletins that could be posted on the TC website. The technical bulletin could be a two-page white paper that is peer reviewed by ASHRAE. More information on the process of posting technical bulletins will be provided at a future meeting.
    - Mark MacCracken offered that he may have material to use in a technical bulletin to post on the website.
10. Honors and Awards – Mike Filler was not present, Geoff Bares reported
  - a. Mike Filler is no longer available to serve in his role reporting on Honors and Awards. Blake Ellis volunteered to report on Honors and Awards.
  - b. Chad Dorgan, a Corresponding Member, received the Exceptional Service Award.
  - c. Mark MacCracken, Voting Member, received the Distinguished Service Award.
  - d. Members heartily congratulated Chad Dorgan and Mark MacCracken for their accomplishments.
  - e. Members will follow through on nominating John Nix for the Hightower Technical Achievement Award.
11. Old Business
  - a. No old business was discussed.
12. New Business
  - a. Geoff Bares agreed to distribute the information about which members are rolling off and which are rolling onto the voting membership roster. In total, 14 voting members were on the roster at this meeting, and a total of 11 voting members will be on the roster by next meeting.
    - Members discussed the current balance in membership on TC 6.9. Currently, membership is about half manufacturers and half designers. TC 6.9 is interested in adding more members with an academic or owner/operator background. Geoff Bares will reach out to the Section 6 liaison to call for more members of various backgrounds.
  - b. Paulo Tabares has agreed to take on the Research Subcommittee Chair role as of Summer 2017. Brian Silveti will continue to stay involved in the current research work.
  - c. ASHRAE has posited that TCs consider holding their subcommittee meetings remotely prior to the in-person main TC meetings. This proposal would increase the number of rooms available for seminars. In addition, subcommittees could potentially accomplish more work ahead of time so that the main meeting is more productive. However, members noted that the most productive meetings are face-to-face. In addition, TC 6.9 has had no issues meeting quorum and many members attend both the subcommittee meetings and the main meeting in-person. The overwhelming TC sentiment is to maintain face-to-face subcommittee meetings.
  - d. The International District Energy Association (IDEA) has scheduled their conference concurrent with the ASHRAE Summer Meeting in Long Beach, CA in June 2017. Due to this conflict, some members may not be in attendance.
  - e. John Karakash visited to thank TC 6.9 for cosponsoring the seminar titled “Heat and Cooling with Woody Biomass for Sustainable and Resilient Buildings and Communities”.
13. Adjournment – A motion was made by John Dunlap to adjourn the meeting. The motion was seconded by Jeff Kane, and approved unanimously by a vote of 9-0-0-CNV. Meeting adjourned at 5:43 PM.