

**ASHRAE TC 6.9 – Thermal Storage
Main Committee Meeting Minutes
Monday, January 22, 2024
4:00 PM – 6:00 PM CST
Chicago, IL
McCormick Place West, W178B(1)**

Attendees

Attendees included:

In person

1. Achutha Tamraparni
2. Alexander Zhivov
3. Allison Mahvi
4. Amy Van Asselt
5. Andreas Antzoulatos
6. Anma Johnson
7. Bill Roy
8. Brent Kovash
9. Bruce Lindsay
10. Casey Troxler
11. Chi Lui
12. Chuck Booten
13. Chuck Dorgan
14. Damilola Akamo
15. Daniel Pyewell
16. David Oliver
17. Deba Maitra
18. Doug Reindl, TAC liaison
19. Dragos Paraschiv
20. Dre Helms
21. Eric Kozubal
22. Erin Blackley
23. Ellery Rlein
24. Emishaw Iffa
25. Isabel Melendez
26. Farzin Rad
27. Gabriel Flechors
28. George Orlanos
29. Hanlong Wan
30. Henry Becker
31. Ivan Thomas
32. James Tancabel
33. Jangho Yang
34. Jared Williams
35. Jason Woods
36. Joel Pertzch
37. John Aykroy

38. John Andrepont
39. John Dunlap
40. John Nix
41. Joshua Rothe
42. Judith Vidal
43. Junke Wang
44. Julie slaughter
45. Jyothis Anand
46. Karl Morgan
47. Kate Fisher
48. Kedar Shete
49. Ken Fulk
50. Kyle Foster
51. Kyle Gluesenkamp
52. Kyle Hack
53. Larry Henkel
54. Lei Gao
55. Lingnan Lin
56. Mathilde Wirtz
57. Mark MacCracken
58. Matt Tilghman
59. Michael Huylo
60. Mike UT Austin
61. Mike Filler
62. Navin Kumar
63. Nicholas Lopes
64. Paul Steffes
65. Petros DaLavouras
66. Philip Hope
67. Rich Kooy
68. Richard Brooks
69. Rohit Dhumane
70. Said Al-Hallaj
71. Sandra Boetcher
72. Sarp Hamamcioglu
73. Som Srestha
74. Spencer Dutton
75. Steve Harrison
76. Stan Nabozny
77. Sven Mumme
78. Tim Anderson
79. Tim LaClair
80. Trent Hunt
81. Tod Green
82. Tom Sottile
83. Tugba Turnaglu
84. Vaughn Engler
85. Xiaobing Liu
86. Xiaoli Liu
87. Xin Jin
88. Yaoyu Li
89. Yang Chao
90. Yiguen Qiao
91. Zhengla Shen
92. Zhenning Li

Online attendees

- 93. Aggrey Mwesigye
- 94. Hooman Arjmand
- 95. Marcus Bianchi
- 96. Reda Djebbar
- 97. Ehsan Ebrahimnia
- 98. Kristin Fletcher
- 99. Keith Ponitz
- 100. Lingshi Wang
- 101. Karl Heine
- 102. Sidibe Oumou
- 103. Patrick MacCormack
- 104. Victor Braciszewski

Preliminaries

- i. Meeting called to order at 4:02PM by Chair Daniel Pyewell
- ii. Reading of TPS and Ethics statement
- iii. Introductions around the room

Establishment of Quorum

- Daniel
- Emishaw
- Chuck
- John
- Hooman
- Ken
- Mike
- Amy

We have 100% of VM.

Approval of Tampa minutes. Amendments to minutes:

- Misspelling of Andrepont last name
- Update Sandra's CM status
- Mike Filler last name misspelled a few places
- Doug's course a few years ago, typo in sentence
- Programs was Bruce Lindsay
- Sandra's RTAR is on Compact modulus TES
- Chair Pyewell to send mark-ups of MOMs to Kyle to update/ finalize

Motion was made and seconded to approve the minutes with amendments discussed today.

Motion to approve approved 7-0-0-0 CNV

Daniel shared some notes:

- on ASHRAE TFBD still has 5 guidelines left to publish. Trying to establish footprint of carbon for every single building. Still wanting to find refrigerant leakage.

- Technical papers: 50% approval rate out of 170 submitted, 91 approved
- Recommended that vice chairs attend the breakfast.
- Roster will updated in coming weeks.
- Ken rolling off this summer as voting member. Open call for new voting members.
 - o Post meeting note – Geoff Bares volunteered to become VM, and will roll on as long as there is no issue with balance (to be reviewed with roster updates)
- ASHRAE seeking input for upcoming 2025 strategic plan.

TAC Liaison report (Doug Reindl)

Doug notes that roster changes will take effect after Indianapolis meeting.

Daniel notes that an online search on the ASHRAE website for “thermal storage” does not return a hit for this TC.

Straw poll by Doug for how many people in the room regularly attend local chapter meetings. Very few hands went up, perhaps 5%.

Judith Vidal notes that the Stor4Build consortium webpage lists meetings and conferences, can point people towards 6.9.

Training and education Liaison report (John Nix)

Used to be called professional development, now called learning and education. A standing committee. Doug Reindl is the author and presented of a seminar. We have a request to put portions of this into seminar e-learning. Takes about \$10k to convert to a e-learning. Submitting a form to learning and education that they look at the seminar.

Related TCs Liaison report (John Nix)

John is also a Liaison for other TCs that deal with thermal storage in environmental. 6.5 climate change, 2.8 building environment, TC 6.7 solar and other renewables. John attended all three and introduced that 6.9 would like to co-sponsor seminars. Also shared with them the standards we'll be putting out for public review.

90.1 Liaison report (Amy)

90.1 is working to integrate TES. Especially heating. Amy has attended full committee, TES subcommittee, and mechanical subcommittee. Making progress, but it's in its infancy.

Update on IDEA – International District Energy Agency – John Andrepont

- Two main conferences each year
 - a. One in February 20-23 in San Francisco, focused on campus energy
 - b. One in summer, June 17-20, in Orlando FL for annual conf, focused on commercial, mostly urban systems
 - c. June 2-5 2025 in Minneapolis

Presentation on Army Corps of Engineers project – Alexander

- At 5:37 Alexander began a presentation on this project.
- Aim of study was to determine under which conditions the TES would be cost effective.
- Various scenarios were evaluated, including standard military building with boiler; CHP, solar; and various climates.
- Alexander is seeking critique and review of the document

- Daniel opened the floor for questions at 5:53
- PTAR is a way to get things published, submit to summer meeting seminar
- Daniel suggests to distribute it via basecamp, maybe condense down to a Technical Paper
- Bruce offers to look into it for winter 2025, address on program subcommittee
- Som suggests to coordinate with TC 1.10 for co-sponsorship. Geoff Bares, T.C. 1.10 chair in attendance, agreed to have his T.C. look at co-sponsorship when development is further along.

Standards – John Dunlap

- 6:03 John Dunlap
- SPC 150 update (John Nix)
 - a. the SPC committee voted this week to put it out for public review
 - b. It's a standard to provide method of test, for testing and performance, not providing pass/fail
 - c. Applies to ice storage and chilled water
- SPC 233P – PCM performance evaluation
 - a. Have 5 members
- ASME TES standards committee published TES-1 in Dec 2023. Next meeting Feb 26, 2024. TES-2 committee meets bimonthly Monday 22nd (was today)
- AHRI 900-2014 – no change since reaffirmed 2020. AHRI looking for members.
- Proposed new standards:
 - a. Measuring non-binary TES – 94.2 – Paul Steffes notes that this standard has become very important in light of 1.45.x potential tax credits. If it could be used in some way, maybe updated. “Method of Testing of Thermal Storage Devices with Electrical Input and Thermal output”
 - b. Current status is the standard was withdrawn
 - c. Need chair and at least 5 members. Paul Steffes agreed to chair and ask for volunteers to service in the next few months.
 - d. Mike Filler notes that there were not a lot of people interested years ago, but is now very relevant to 1.45.x tax standard
 - e. Ken Fulk outlined some of the duties of the chair
 - f. John notes there are also withdrawn standards related to TES, 94.1 (latent heat), and 94.3. that may be becoming more relevant now. Currently trying out these test methods. Chair Pyewell indicated that we may want to use 94.2 as a proving grounds before we move on reinstating 94.1 and 94.3.

Programs – Bruce Lindsay

- 6:18 PM
- Submitted Atlanta projects Oct 9. Oct 16 the 40% tax credit was passed. Managed to sneak in a program. Top 3 most attended programs in Atlanta were all TES!
- We had 4 programs in Chicago, and a tour:
 - a. Yesterday had unbelievable attendance.
 - b. 40% tax credit seminar.
 - c. Tomorrow morning, South Hall, 9 AM, kickoff of AHR Expo public sessions, featuring the massive TES systems in Chicago.

- d. Also electrification of tall buildings will have TES component.
- Key things coming up for Indianapolis in June:
 - a. Forum: on tax credits, tax deductions, utility rebates, accelerated depreciation
 - b. JUMP into STEM student competition. Winners were ERAU, Purdue, and WPI. Working on funding for student travel.
 - c. Seminar: hybrid batteries, using ice tanks for heating in NY, utility rebates for electric batteries and thermal batteries
- Orlando June 2025 program
 - a. History of TES at ERAU
 - b. TES systems in space coast in Orlando
 - c. Section 179D tax deductions – how engineering firms can make money
- TC6.9 Hall of Fame. Organizing committee to name people for hall of fame. In 2019 published “evolution of TES for cooling applications.”
- Mike moved to submit, John Dunlap seconded, approved 8-0-0-0 CV

Handbook – Navin

- 6:29 PM
- Seeking volunteers to work on handbook
- Feb 2025 notification deadline if wanting to make changes
- Online version can be updated every 6 months
- Navin notes that nothing that is AI generated can be used in the Handbook.
- Daniel notes that this is a good time to coordinate with Navin
 - a. Henry Becker had suggestions for additions on water quality.
 - b. Stan wanted to include language on commissioning, and thermal profiles.

Research – Paulo (covered today by Daniel)

- 6:32 PM
- TC 6.8 is working on a WS, integration of TES with geothermal HP, which has been approved. 6.9 is currently a co-sponsor of the RTAR.

Long Range Planning / Website

- TC is now on basecamp, which is becoming hub for communication. Please reach out to Chair Daniel Pyewell if you don't have access.
- 24 PCM have joined the TC recently

Honors and Awards – Blake Ellis

- Updated ASHRAE bio is essential
- Hightower award – given for last 4 years of TC activity, due by Sept 1
- May 1 due date for some awards, including DSA and ESA
- Dec 1 due date for some awards, including Fellow nominations

Old business

- Emishaw – how to implement TES in E+. Based on the feedback from TC 6.9, a short document has been prepared and has been completed around the Tampa conference. Should be in public domain soon.

New business

- Discussion on basecamp, related to Paulo's proposal to change TPS.
 - a. John Andrepont notes that he understands the impetus to update the scope, but thinks we should stick to the existing neutral scope, which doesn't exclude anything.
 - b. John Nix notes that the existing TPS doesn't exclude things.
 - c. Ken Fulk notes that hitting on hot topics is important for Program, but not so for TPS.
 - d. John A notes we can address these things with updates to Handbook and in Programs
 - e. Stan notes the purpose should address the "why" of what we're doing
 - f. Amy Van Asselt notes that the current statement is about the details of the systems, but doesn't speak to the purpose, we aren't talking about those things. Amy likes how general the current statement is, but feels it could be updated to address more of the purpose.
 - g. Ken suggests that, if changing, a subcommittee should be formed to propose something well ahead of the next meeting.
 - h. Amy volunteered to get the relevant people together.
 - i. Sven notes it is the purpose of the TC, not the purpose of TES.
- Guy Frankenfield retired in December. His company reassigned his voting duties to Hooman.
- Kyle Gluesenkamp and Sven Mumme noted that the Stor4Build consortium has been created, aiming to accelerate the adoption of energy storage in buildings. It has two steering councils, led by national labs and includes stakeholders from industry, etc. Judith Vidal notes we have selected 15 projects, including integration into equipment, integration into envelope. Aiming to demonstrate benefit in disadvantaged communities. Integration, materials, modeling, controls, and test procedures.
- Sven notes the BTO has a draft roadmap for TES, currently in internal reviews, hopefully released to public in coming months. Hoping in less than two months.
- Bruce notes that in Indianapolis, the Program subcommittee will likely want to have a presentation on the BTO roadmap.
- Som notes there will be a separate track on TES in 2025 Winter conference (pending RAC approval)
- Annual review and vote to continue, merge, or disband. Moved by John, seconded by Ken, approved 8-0-0-0 CV to continue as FG.

Meeting adjourned at 5:57 PM

