

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

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 6.5 DATE May 5, 2021

TC/TG/MTG/TRG TITLE Radiant Heating and Cooling

DATE OF MEETING April 23, 2021 LOCATION Remote VIRTUAL

MEMBERS PRESENT	MEMBERS PRESENT
Ongun Berk Kazanci	Brett Austin
Ryan Westlund	Fred Bauman
Noah Zallen	Michael O'Rourke
Robert Bean	

MEMBERS ABSENT
Jaap Hogeling (non-quorum)
Aaron Stotko
David Springer
Richard Bowman

DISTRIBUTION

<i>All Members of TC/TG/MTG/TRG plus the following:</i>	
TAC Section Head:	Dawen Lu
TAC Chair:	Jay Kohler
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters:	Steven Hammerling
Standard Liaison Manager Of Research & Technical Services	Craig Wray Mike Vaughn
Research Liaison	Omar Abdelaziz

MEETING MINUTES
TC 6.5 – RADIANT HEATING & COOLING
SUMMER 2021 ANNUAL CONFERENCE MEETING (VIRTUAL)
June 18, 2021
2 pm – 4 pm

TC 6.5 Positions and Subcommittee Chairs

Published Meeting Agenda (Ongun Berk Kazanci, TC Chair)

Meeting Agenda

1. Introduction of members and guests
2. Roll call for quorum
3. Reading of previous meeting minutes and vote for approval
4. Agenda amendments
5. Information from Section 6 Chair meeting
6. Subcommittee Reports
7. Old Business
8. New Business
9. Liaisons introduction and reports
10. Technical presentations
11. Adjourn

Meeting Minutes:

1. Introduction of members and guests. **See Appendix A for list of attendees
2. Roll call for quorum
 - a. Voting members: 7-11 (Quorum v)
 - b. **See Appendix A for list of attendees
3. Reading of previous meeting minutes and vote for approval
 - a. Approved unanimously.

4. Agenda amendments

- a. G.D. Mathur, handbook liaison for applications is in attendance → move his topics to beginning of Agenda (see minutes under original Agenda location 6.iv.)

5. Information from Section 6 Chair Meeting

- a. Chair's update for TC's information
 - 1. See [this link](#) for Phoenix committee meetings and technical programs
 - 2. ASHRAE Winter Meeting, Jan. 31-Feb. 2, 2022 Las Vegas; [click here](#) for more.
 - 3. TC reorganization meeting issued final report with TC mergers and are considering more
 - a. Newly merged TC's: 3.2+3.3; 8.10+8.12; 9.4+9.8; 7.3+7.8; 10.1+10.3; 10.2+10.5+10.8
 - 4. Accepting nominations from George B. Hightower Technical Achievement Award
 - a. In recognition of exceptional service in the area of technical leadership and technical contribution in the past four years.
 - b. Nominations due Sept. 1, 2021
 - c. Note that Devin Abellon from our TC won in 2019-2020
 - 5. Other announcements:
 - a. Upcoming TAC meetings will allow for "open mic"
 - i. For any TAC/TC related questions please use ASKTAC@ashrae.net
 - b. The ASHRAE Societal Strategic plan has been extended to include 2025 (2019-2025)
 - c. ASHRAE encourages interim meetings; see posted meetings on [TC webpage](#)
 - d. Focus on keeping the TC Website up to date

6. Subcommittee Reports

i. Programs Subcommittee (Noah Zallen, Chair)

- 1. Diversity Equity and Inclusion DEI in ASHRAE (see notice)
- 2. Virtual Presentations – Recap (Winter 2021)
 - a. Summary of virtual presentation topics covered in the Winter 2021 meeting programs
- 3. Aug. 2nd submissions are due for Winter 2022 Conference (Las Vegas)
 - a. See tracks:
 - i. Energy systems and integration is most interesting track
 - ii. Buildings at 360 – holistic building design
 - iii. HVAC Systems and Fundamentals could also fit per usual
 - iv. Seminar tracker will go out from Noah with an external meeting in July to organize for gathering and submitting
 - b. D. Larrison would like to make seminar for basic infrared understanding with industrial applications, dock doors, hangars, etc. – TC

recommendation to propose Winter 2022 seminar with reference to planned Summer 2021 (Phoenix) seminar as a continued focus

- c. Chair requests to make seminar tracker shared via google doc or via Basecamp [**ACTION: N. Zallen**]

4. Upcoming Calendar for Programs

- a. Phoenix, AZ (Summer 2021)
- b. Las Vegas, NV (Winter 2022)
- c. Toronto, ON (Summer 2022)

ii. **Research Subcommittee** (Fred Bauman, Chair)

1. RTAR – Solar Load (Peter Simmonds)

- a. Posted on Basecamp, please review [**ACTION: ALL**]
 - i. Especially pertinent to those who volunteered to assist in review.
- b. Author soliciting advice on how to improve attractiveness of write-up
- c. Plan: RAC liaison to have for first review JUL 2.
- d. Key questions posed (anticipated RAC evaluation questions):
 - i. What deliverables would members expect from this research?
 - ii. Is there a useful tool or practical resource that is made available by this RTAE
- e. J. Wooley from TC 4.1 expressed interest in co-sponsored RTAR, given TC 4.1 has a history of addressing “load” issues and research
- f. Subcommittee Chair initially supports as a solid TC with good input
- g. Outcome: Author to include on RTAR and then re-evaluate if they should be actively engaged based on work statement [**ACTION: P. Simmonds** to discuss offline and determine next steps]

2. PTAR 0001 – Radiant Design Guide (Fred Bauman)

- a. See latest draft put into RAC’s template in Basecamp [**ACTION: ALL**]
- b. Author requesting additional support on key section
 - i. “What prior or ongoing ASHRAE research will be disseminated through publication of this [PTAR]...”
 - ii. Limited ASHRAE specific research or publications are available on topic
 - iii. See list resources from P. Simmonds and R. Bean compiled and shared on Basecamp [**ACTION: F. Bauman**]
- c. Author proposes we vote on this to leave open to add references for prior work
 - i. F. Bauman motions above → Chair Seconded
 - ii. Approved unanimously

3. CBE & ICIEE-DTU

- a. CBE (Carlos Duarte, Post-doc):
 - i. Time to be allotted at end of TC Meeting

4. DTU

- a. New guidebook as presented in Kansas City Meeting
- b. DTU Post-Doc, Jun Shinoda, will push forward with PCM and radiant panels research

5. Other research
 - a. No Discussion
- iii. ALI & Education (Robert Bean, Chair)
 1. Need to define next steps
 2. Determine suitable volunteer to take lead for ALI course revamp. **[ACTION: R. Westlund]**
- iv. Handbook (Devin Abellon, Chair)

***NOTE: Chronologically occurred prior to Agenda #5 due to visiting liaison*
Subcommittee members: See Appendix B for complete list of volunteers

 1. Ch. 55 (Applications): Radiant Heating and Cooling
 - a. Prepare for 2023 Publication
 - b. All electronic versions of chapters can be found on Google doc links for all sections (See Appendix C)
 - c. Current workplan outlines completion of final draft by 4/22/2022
 - d. Target 1st draft for TC review by 12/1/2021 to solicit comments. **[ACTION: R. Westlund]**
 - e. Final draft due by Winter Conference 2022. Target final vote from TC on 4/15/2022
 2. Ch. 52 (Applications) Snow and Ice Melting (Ryan Westlund)
 - a. Prepare for 2023 Publication
 - b. All to review to determine if further updates needed, based on more substantial changes occurring in last iteration (2019) **[ACTION: All]**
 - c. Get author portal access for Heather Kennedy. **[ACTION: D. Abellon]**
 3. Ch. 16 (Systems & Equipment): Infrared Radiant Heating (Don Larsson)
 - a. Review status at 2022 Winter Conference (Las Vegas)
 - b. Review of existing research and publications. **[ACTION: D. Larsson]**
 - c. Final draft review at 2023 Winter Conference (Atlanta)
 - d. Final Approval planned for April 2023
 4. Ch. 34 (S&E): Residential In-Space Heating Equipment
 - a. Seeking lead reviewer **[ACTION: Subcommittee Chair to discuss offline with A. MacPherson]**
 - b. Review status at 2022 Winter Conference (Las Vegas)
 - c. Final draft review at 2023 Winter Conference (Atlanta)
 - d. Final Approval planned for April 2023
- v. Standards & Industry Codes/Certifications (Richard Watson)
 1. SSPC 90.1 Committee Liaison (Richard Watson) *No update*
 2. SSPC 55 Committee Liaison (Robert Bean)
 - a. Republished with updates (see list of approved addenda/ additions to standard)

- b. Standard continues to fully support TC 6.5 messaging
- 3. ISO/TC 205 Committee Liaison (Prof. Kim) *No Update*
- 4. UMC Radiant Cooling Task Group Liaison (L. MacNevin) *No update*

7. **Old Business**

- i. None

8. **New Business**

- i. Standards subcommittee update and restructure
 - 1. Add more updates from industry with appropriate liaisons
 - 2. Google doc to be created with listed liaisons [**ACTION: Chair**]. It will be used to coordinate tangential groups' work
- ii. Short technical presentations during the main TC meeting
 - 1. See Agenda item #10 for first installment
- iii. UN SDGs and radiant systems (A. MacPherson)
 - 1. A. MacPherson has identified the relevant SDGs for TC 6.5 3, 7, 9, 12, & 17
 - 2. Check with ASHRAE to confirm posting on website is acceptable. [**ACTION: Chair**]

9. **Liaisons introduction and reports**

**NOTE: Completed Agenda item #9 through Handbook Subcommittee update

10. **Technical presentations**

- i. PG&E's research on ceiling panels with PCMs (James Haile, Frontier Energy)
 - 1. Presented Central Valley Research Homes Collaborative with Hydronics test house. Slides to be posted on Basecamp for data and findings [**ACTION: Chair**]
- ii. "How high can you go?" (Carlos Duarte, CBE)
 - 1. Presented on simulations to show the highest EWT for high mass radiant systems and ramifications for hydronic source plant. Slides to be posted on Basecamp for data and findings [**ACTION: Chair**]
- iii. Any other presentations or short discussions are welcome
- iv. Solicit volunteer guest presenters for next TC meeting

11. **Adjourn**

- i. Motion: N. Zallen;
- ii. Second: D. Abellon;
- iii. Passes- Unanimous (TIME: 4:05 EST)

APPENDIX A: List of attendees

TC 6.5 Positions and Subcommittee Chairs (8):

Ongun Berk Kazanci, Chair, VM
Ryan Westlund, Secretary, VM
Robert Bean, ALI & Education Subcommittee Chair, VM
Noah Zallen, Programs Subcommittee Chair, VM
Fred Bauman, Research Subcommittee Chair, VM
Michael O'Rourke, VM
Brett Austin, VM
Devin Abbellon, Research Subcommittee Chair

Additional Attendees (19):

Jeff Matson
Peter Simmonds
Carlos Duarte
Don Larrison
Auralee MacPherson
James Haile
George File
Stephan
G Paulsen
Hailey Mick
Hank Cullinane
Scott Hellendrung
Jun Shinoda
Zach Lando
Andrew Koppi
Ardi Moftakhari
Stephano Schiavon
Stephen Chally
Dave Desjardens

APPENDIX B: List of Handbook Subcommittee members

Chair:

Devin Abellon

Volunteers:

Aaron Stotko

Brendan McDermott

David Desjardin

Dave Springer

Lance MacNevin

Sven Lie

Mike Torjan

Ryan Westlund

Robert Bean

Katherine D'avignon

Don Larsson

Him Ly

Adam Botts

Peter Simmonds

Jonathan Woolley

Brett Austin

Noah Zallen

APPENDIX C: ASHRAE Handbook Chapter 55 Sections under the Responsibility of TC 6.5

Section	Topic	Lead	Target Length	Google Doc Link
A	Introduction	Ryan Westlund	3	SECTION A
B	Definitions	David Desjardins	2	SECTION B
C	System Types	Robert Bean	1	SECTION C
D	Architectural Design Considerations	Peter Simmonds	3	SECTION D
E	Hydronic Embedded Systems	Jonathan Woolley	8	SECTION E
F	Manufactured Hydronic Panels	Mike Torjan	5	SECTION F
G	Electric Radiant Systems	Brendan McDermott	4	SECTION G
H	References	Peter Simmonds	1	SECTION H
I	Emerging Technologies	Noah Zallen	4	SECTION I
J	Design Integration	Peter Simmonds	4	SECTION J