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DRAFT UNAPPROVED

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 4.1 DATE 2/23/2025

TC/TG/MTG/TRG TITLE Load Calculation Data & Procedures

DATE OF MEETING Monday 2/10/2025 LOCATION Orlando Hilton, Lake Florence B (Lobby Level)

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Chip Barnaby	2022			Starr Amey (City of Tampa)
Liam Buckley	2024			Charlie Curcija (LBNL)
Glenn Friedman	2024			Daniel Guzman (NAVFAC)
Suzanne Leviseur	2022			Ed Jankowski (ACCA)
Ardeshir Moftakhari	2022			Rolando Legarreta (Alegro Engr)
Jim Pegues	2024			Yapan Liu (Fraunhofer USA)
Rachel Spitler	2022			James Lowry (ZMM)
Chris Wilkins	2021			Dhyan Patel (Texas A&M)
				Brian Rock
				Stephen Roth (Carmel Software)
				Larry Sun (DMB)
				Russell Taylor (Carrier)
				M. Weiland
				Graham S. Wright (Phius)

DISTRIBUTION: ***All Members of TC/TG/MTG/TRG plus the following:***	
TAC Section Head: Kyle Gluesenkamp	SH4@ashrae.net
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	Staff: shammerling@ashrae.org
Mike Vaughn, Manager Of Research & Technical Services	MORTS@ashrae.net

Note: These draft minutes have not been approved and are not the official, approved record until approved by the TC.

TC 4.1 Web Site: https://tc0401.ashraetcs.org/

ASHRAE Technical Committee 4.1

ASHRAE TC 4.1
Load Calculation Data & Procedures

Full Committee Meeting Agenda

2025 ASHRAE Winter Conference
Hybrid Meeting
In-Person: Orlando Hilton, Florence B (Lobby Level)

Summary of Votes Taken

	Motion	Result	Vote
1	Approve Indianapolis Summer 2024 meeting minutes	Passed	7-0-0-0-CNV
2	Approve revised WS-1959 for submission to RAC	Passed	6-0-0-1-CNV
3	Approve RTAR for Simplified Method for Calculating Heating Warm-Up Loads for submission to RAC	Passed	7-0-0-0-CNV

Summary of Action Items

	Assigned To	Action
1	James Lowry, Glenn Friedman, Jim Pegues	Organize and evolve concepts for program presentations on (1) Load Calculations using BIM models, and (2) Load Calculation Workflows for young engineers, for Winter Conference in Las Vegas
2	Ardi Moftakhari, Graham Wright, Russ Taylor, Glenn Friedman	Collaborate to refine the draft RTAR for 24-hour dynamic heating load calculation
3	Jim Pegues	Develop straw man outline for reorganized 2029 Handbook chapters: Load Calculation Theory and Load Calculation Workflow
4	Jim Pegues	Poll committee members on their favorite example of successful organization of material about load calculations.
5	Jim Pegues	Schedule a web meeting mid way between winter and summer meetings for TC 4.1 members to discuss the new straw man outline for 2029 Handbook chapters.
6	Chris Wilkins	Collect more information on the research idea involving using AI to convert a BIM model into an analytical model for load calculations.

1. Call to order [2:15 PM ET] Rachel Spitler

2. ASHRAE Code of Ethics Commitment Rachel Spitler

"*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 ASHRAE Code of Ethics: https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics)

3. Roll call – Determination of a Quorum Jim Pegues

8 of 8 voting members present. Quorum exists

4. Introductions All

5. **Scope, Mission Statement** Rachel Spitler

Scope: TC 4.1 is concerned with the identification and compilation of engineering data and the development of procedures for calculating heating, cooling, refrigeration, and ventilating loads of structures.

Mission Statement: To serve practitioners by advancing the data and procedures of load calculations.

6. Agenda additions

None

7. Liaison reports **Liaisons**

a. Section Head — Kyle Gluesenkamp

Reminder that roster updates are due at this meeting.

b. Chapter Technology Transfer — Christopher Adams

Liaison did not attend.

c. Research — Dennis Landsberg

Liaison attended research subcommittee meeting on Sunday

d. Handbook — Eric Granzow

Liaison did not attend.

e. Staff, Research/Tech Services — Steven J Hammerling

Liaison did not attend

f. Standards — Mr Philip J Naughton

Liaison did not attend

g. TAC Chairman — James S Bennett

Liaison did not attend

8. Chair's Report Rachel Spitler

a. TC Chairs Breakfast

- ASHRAE is working to establish a Young Engineers at ASHRAE (YEA) Conference Mentorship Program. Involves mentoring YEA members at ASHRAE conferences. Contact youngengineers@ashrae.org if interested or for more information.
- ASHRAE 2025-2028 Strategic Plan will be released in June. A draft copy is available now upon request.
- Fellows nominations are due May 1.
- ASHRAE TAGs participating in ISO working groups. ISO/TC 205/WG9 Heating and Cooling Systems overlaps with TC 4.1's scope. If interested in being on the US TAG, attending ISO meetings as a US expert, or serving as a TAG resource for document review, contact Kai Nguyen (knguyen@ashrae.org).
- MTG-CEA – Multidisciplinary Task Group for Controlled Environment Agriculture. Relates to indoor grow facilities. One of the MTG's activities concerns how to calculate cooling and heating loads for grow facilities. Cannabis industry is driving this committee, but what is developed will have wider application to other kinds of indoor agriculture applications.
  Rolando Legarreta is TC 4.1's representative. Next web meeting occurs Tuesday, Feb 12, 9-11am. Rachel will ask Stephen Roth if he is able to attend as Rolando has a conflict.

9. Approval of minutes from 2024 Summer Meeting Rachel Spitler

Motion: Approve Indianapolis Summer 2024 Meeting Minutes
Motion By: Glenn Friedman
Second By: Jim Pegues
Vote: 7-0-0-0-CNV (for-against-abstain-absent-Chair-Not-Voting)

10. Subcommittee reports

a. Programs: James Lowry

- No programs at Orlando winter conference.
- No programs planned for Phoenix summer conference
- Plan is to put forward 2 programs for Las Vegas (winter conference 2026)
- First idea – Load Calculations using BIM models.
- Second idea – Loads workflow. Targeting young engineers.
- Third idea – Liam Buckley is composing a proposal for a program and will submit.
- Glenn Friedman and Jim Pegues volunteered to help James organize and evolve the concept and content for the presentations for ideas 1 and 2.

b. Research: Ardi Moftakhari

- RP-1861 – Heat gain from imaging equipment. No update. They have not yet published results. Project had been delayed by lack of access to facilities during COVID pandemic. They have now collected the data but had not yet processed the data.
- RP-1923 – Climate data update for 2025 HOF – Data has been collected, processed, and submitted for publication in the 2025 ASHRAE Handbook – Fundamentals and in the Weather Data Viewer. Final report is being written.
- RP-1857 – Simplified method for ground conduction – Project has started.

c. Research (continued):

- WS-1959 – Update people heat gain data for cooling load calculations – Work Statement (WS) was returned by RAC with comments. Comments have been addressed. Ready to resubmit WS to RAC

  Motion: Approve revised WS-1959 for submission to Research Activities Committee.
  Motion By: Chris Wilkins
  Second By: Suzanne Leviseur
  Vote: 6-0-0-1-CNV (for-against-abstain-absent-Chair-Not-Voting)

- RP1850 – Evaluates shapes of cooling design day weather profiles (temperature and humidity) based on measured weather data. Currently Work Statement is being revised and will be resubmitted to RAC. Ardi asked TC 4.2 to revise the scope to include heating design day data. TC 4.2 is the lead sponsor and TC 4.1 is co-sponsoring.

- RTAR – Simplified method for calculating heating warmup load – Chris Wilkins is leading development of RTAR. More accurate estimation of warm up load is important for heat pumps. With boilers, oversizing had little economic or operational consequences. With heat pumps there are large economic, space, and operational issues. You can calculate warmup with a detailed 24-hour transient calculation. But what is needed for more simplified calculation that designers can easily apply.

  Motion: Approve RTAR for Simplified Method for Calculating Heating Warm Up Loads for submission to RAC, subject to editing by RTAR author
  Motion By: Chris Wilkins
  Second By: Suzanne Leviseur
  Vote: 7-0-0-0-CNV (for-against-abstain-absent-Chair-Not-Voting)

- RTAR – 24-hour dynamic heating load calculation for sizing heat pumps. Development led by Graham Wright. Graham is a representative from SPC 227P, Passive Building Design Standard. Concerned about oversizing of heating load for passive building applications. A 24-hour steady periodic dynamic load calculation is needed to consider all factors adequately. A 24-hour design heating day weather profile is needed considering temperature and solar radiation. May need two separate profiles, one representing a clear cold day and one representing a cloudy milder day for consideration. Would like to reference the design heating day and the calculation method in Standard 227P. Ultimate goal is for Standard 227P to be referenced by stretch building codes.

  Discussion indicated the focus of the proposed research project is defining how to construct the 24-hour steady periodic design heating day weather profiles.

  ACTION: Ardi will work with Graham to refine the draft RTAR. Russ Taylor and Glenn Friedman also volunteered to help with this activity.

- RTAR – Update to residential load calculation method and data. Concept still being developed.

- Research Concept: Research on use of AI to convert BIM model into analytical model that can be used for load calculations. ACTION: Chris will collect more information to advance this idea.

d. Handbook — Jim Pegues
- Updated chapters 17 and 18 due to be published in June in 2025 ASHRAE Handbook – Fundamentals.
- Work on 2029 Handbook chapters has already begun. Have been discussing a major reorganization of material to better serve needs of consulting engineers and young engineers.
- ACTION: Jim to develop straw man outline arranging material in two chapters: Theory and Workflow. Workflow is to have a kind of "cookbook" design, describing what to do first, what to do next, etc.., describing what data to collect and how to use it in calculations in each step, with references to the Theory chapter for background principles and fundamental concepts.
- ACTION: Jim to poll committee members on their favorite example of successful organization of material on load calculations. In subcommittee, several past editions of ASHRAE Handbooks as well as other technical publication were mentioned. To serve as examples guiding organizations of the 2029 chapters.
- ACTION: Jim to schedule a web meeting mid-way between winter and summer meeting to present straw man proposal and advance discussion.
- Issue of mathematics was tabled as a lower-level issue to deal with once an outline is established.
- For further details, see Handbook Subcommittee Report attached to these minutes.

e. Standards — Glenn Friedman
- Currently no activity on TC 4.1's two standards: Standard 183-2024 – *Peak Cooling and Heating Load Calculations in Buildings Except Low-Rise Residential Buildings* and Standard 203-2018 (RA 2021) – *Method of Test for Determining Heat Gain of Office Equipment Used in Buildings*.

f. Web Site — Jim Pegues
- Web site is up to date.

11. Old Business — Rachel Spitler

None

12. New Business — Rachel Spitler

a. Air Conditioning Contractors of America (ACCA) is preparing to revise Manual J Residential Load Calculation and has invited Glenn Friedman to participate in that work.

b. ISO Working Group 205 - Cooling and Heating Systems. Anyone who is interested in this working group, please contact Rachel for information. ASHRAE involvement in this working group is part of an ongoing effort to harmonize standards.

13. Adjourn [4:04 PM EDT] Rachel Spitler

Motion: Adjourn
Motion By: Chip Barnaby
Second: Chris Wilkins

Attachment:

Attachment 1 – Handbook Subcommittee Report