

ASHRAE TC 10.1

Custom Engineered Refrigeration Systems

ASHRAE 2026 Annual Conference – TC 10.1 meeting agenda

February 2nd, 2026, ~ 10:00 am – 12:00 pm Pacific Standard Time

Caesars Palace ~ Meeting Room: Modena (P)

Microsoft Teams ~ Teams ~ Meeting ID: 227 871 505 168 4 ~ Passcode: 3zJ6z9gD g

To: Members and guests of TC 10.1

From: Andy Campbell, TC 10.1 Chair

Date: February 2nd 2026

Stared at 12:01 p.m PT

I. Preliminaries.

- A. Call to order.
- B. ASHRAE Code of Ethics Commitment: 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 interest and behavior that is discriminatory and/or harassing.
 - 1. <https://www.ashrae.org/about/governance/code-of-ethics>
- C. Self-introductions & attendance sheet.
- D. Verify quorum – voting members: (7 present, 1 absent (Gordon))

Name	Status	Position
Adnan Ayub	Voting	Vice Chair/secretary
Andy Campbell	Voting	Chair/program Subcom Chair
Gordon Struder	Voting	Member
Heather Sharif	Voting	Member
John Schoen	Voting	Webmaster
Kartik Patel	Voting	Member
M Anderson	Voting	Member
Martin Timm	Voting	Member
Adrienne Thomle	Non-voting	Handbook Liaison
Andreas Hoess	Non-voting	Research Subcom Chair
Gregory Scrivener	Non-voting	Stds Subcom Chair
Gursaran Mathur	Non-voting	Section Head
Satheesh Kulankara	Non-voting	Tac Chairman
Steven Hammerling	Non-voting	Staff Liaison
Wayne Borrowman	Non-voting	Handbook Subcom Chair
WenBin Ng	Non-voting	Research Liaison

Alec Cusick	Non-voting	Corresponding Member
Apichit Lumlertpongpana	Non-voting	Corresponding Member
Bent Wiencke	Non-voting	Corresponding Member
Bruce Griffith	Non-voting	Corresponding Member
Cameron Klein	Non-voting	Corresponding Member
Chengzhi Tang	Non-voting	Corresponding Member
Claude Wilkinson	Non-voting	Corresponding Member
Daniel Dettmers	Non-voting	Corresponding Member
Danny Halel	Non-voting	Corresponding Member
Darrell Peil	Non-voting	Corresponding Member
David Snyder	Non-voting	Corresponding Member
Douglas Reindl	Non-voting	Corresponding Member
Douglas Scott	Non-voting	Corresponding Member
Eric Ramon	Non-voting	Corresponding Member
Eric Smith	Non-voting	Corresponding Member
Gordon Hart	Non-voting	Corresponding Member
Jim Caylor	Non-voting	Corresponding Member
John Gallaher	Non-voting	Corresponding Member
Kathleen Neault	Non-voting	Corresponding Member
Lane Loyko	Non-voting	Corresponding Member
Lorenzo Cremaschi	Non-voting	Corresponding Member
Mark Pearson	Non-voting	Corresponding Member
Robert Neely	Non-voting	Corresponding Member
Roxanne Scott	Non-voting	Corresponding Member
Steven Sanders	Non-voting	Corresponding Member
Willis Brayman	Non-voting	Corresponding Member
Aldo Frias Munoz	Non-voting	Provisional Corresponding Member
Antonio Oliveria	Non-voting	Provisional Corresponding Member
Brad Campbell	Non-voting	Provisional Corresponding Member
Bruce Lindsay	Non-voting	Provisional Corresponding Member
Cameron Klein	Non-voting	Provisional Corresponding Member
Dongmin Jung	Non-voting	Provisional Corresponding Member
Geoffrey Raifsnider	Non-voting	Provisional Corresponding Member
Jonathan Stockton	Non-voting	Provisional Corresponding Member
Joseph De Filippis	Non-voting	Provisional Corresponding Member
Luis Alvarado	Non-voting	Provisional Corresponding Member
Matthew Catan	Non-voting	Provisional Corresponding Member
Naomi Carmeli Shabtay	Non-voting	Provisional Corresponding Member
Nishit Parikh	Non-voting	Provisional Corresponding Member
Omar Youssef	Non-voting	Provisional Corresponding Member
PEDRO STORCK	Non-voting	Provisional Corresponding Member
Taylor Lund	Non-voting	Provisional Corresponding Member

II. Additions and changes to agenda.

Sustainability and resilience request of committee members

III. Review and approval of 2025 Winter Conference draft minutes.

- A. 2025 Summer Conference committee meeting draft minutes have been previously distributed via the TC's website.

Andy Campbell to send minutes to Andy Schoen

- B. The following comments are from Wenbin:

1. RAC member and research liaison – any RTARs or proposals should be sent to him.

We have received a budget form for 2025 – 26 (3 RTARs received, 2 returned; 3 work statements and 1 returned), thus above budget.

Procedurals in basecamp – training for PMS in basecamp

New Investigator award – December deadline

2. By 3rd of March – graduate student award
3. Innovative research grant deadline – December 3rd
4. Service to ASHRAE Research award deadline– September 1st

IV. Chair's Report (Adnan in Andy's absence).

- A. Eleven (11) officers, three (3) of whom are voting members.
- B. Eight (8) voting members (VM).
- C. Twenty-six (26) corresponding members (CM).
- D. Fifteen (15) provisional corresponding members (PCM).
- E. Total of fifty-seven (57) members.
- F. We need a volunteer to serve as Secretary – please contact TC 10.1 Chair if interested – Danny Helal offered to volunteer.
- G. We need a volunteer to serve as Program Subcommittee Chair – please contact Andy Campbell (TC 10.1 Chair) if interested.

V. Liaison Reports.

- A. Section 10 Head – Gursaran Mathur (SH10@ashrae.net)

TAC committee had long discussion in Sunday morning; have to have activity forms by Tuesday

March 6th is the deadline for the roster update

All changes are to apply by July 1st

ASHRAE research – current funding 2-3 million a year; Steve Hammerling is point of contact for research

Basecamp – evaluation form (8 components to fill out)

Subcommittee meetings need to be done in advance before conference; no in person meetings anymore.

ASHRAE annual dues – has increased by \$5; it will be \$290 for everyone
2031 Las Vegas meeting will be in March

B. Other Societies.

1. ASHRAE 15 (Chris Williams).

Nothing discussed since Chris was absent.

2. ASME (Jim Caylor).

a. 2026 edition 31.5 out in Q3-4 this year.

Changes: Rebuild of revision of design chapter (Colmac); made changes; substantial def. sec 5 of 4.7 design of retaining components for OEMs, more explicit and defined escape hatch of what is acceptable for the components; public review of Q2 this year.

3. CSA (Wayne Borrowman).

Revision in 2025; B52 currently catching up to changes in ASHRAE 15 (2L since 2024), looking at expanding with Europe's standards.

4. IIAR (Eric Smith)

Standards of IIAR 5 published, 6 , and 7 in past several months, addenda to CO2 standard (main change: requirement to use direct homogenous integration for determination of relief valve capacity; coordinate at ASHRAE 15)

Bruce Nelson: Issue with ASHRAE 15: sizing a relief device for protection, the table of ASHRAE 15 does not show a way to size relief valve for supercritical pressures (stops at 850 psig). Seeing increase of standstill pressures.

Chairman of research committee identified method of relief devices above critical pt of supercritical pressures; going to addendum.

Back to Eric: Updated website to provide resources page with refrigerant comparison tool, natural refrigerants director, more informational videos for the layperson available

Numerous papers on research page

March 15-18 in San Antonio: Conf.

Bruce: CO2 Research – IIAR conducting research with principal investigators of UC Cal Berkely dry ice forming in relief piping.

Flash tank in Co2 trans CO2, 100-120 bar and relieving at that pressure; may have dry ice in relief vent line, thus study figures out how much dry ice is formed. Results by end of the year.

Eric: Study of when and whether internal relief valves; IIAR does not have replacement interval for such valves; pushback from regulators in the past,

but no failures as of now.

IO Mosaic studying whether such valves will fail to relieve; if so, how often replacement or reverification. Should be.

May look at other refrigerants

Looking for donation of valves from end users

5. Insulation societies:

a. NIA (National Insulation Association).

Alec Cusick: Ongoing development of insulation standards; set of guides for installers and specifiers on how to put it together. Looking for volunteers for standards and developments (flanges, pipe supports, vapor returner, repair of damaged systems, etc.)

If you are involved in developing these standard, please coordinate with them and SC 27 (AMP).

Eric Smith: Installation guideline from IAR publishes (research committee) (Gordon Hart)

Will be brought up for discussion.

i. MICA (Midwest Insulation Contractors Association).

ii. Refrigeration.

iii. Cryogenic.

b. ASTM.

VI. Handbook Subcommittee Report (Wayne Borrowman).

A. Handbook chapters.

1. Insulation: Chapter 10 (Insulation Systems).

2. Refrigeration: Chapter 1 (Halocarbon), Chapter 2 (NH₃), Chapter 3 (CO₂), Chapter 4 (Overfeed), Chapter 5 (Component Balancing), Chapter 13 (Secondary Coolants), Chapter 45 (Concrete Dams), Chapter 46 (Chemical Industry), Chapter 47 (Cryogenics), Chapter 48 (Ultralow Temperature) and Chapter 49 (Biomedical Applications) and Chapter 50 (Terminology) will be reviewed for the 2026 RHB.

a. Chapter 1 (Halocarbon).

b. Chapter 2 (Ammonia) - Ch 3 (Carbon Dioxide) - Ch 5 (Component Balancing).

c. Chapter 13 (Secondary Coolants)

All chapters sent in for revising and waiting for proofs

Chapter 1: extensive revisions especially halocarbon and hydrocarbon

46: Editorial changes

10: new content

5: provide detailed explanation of calculations

3: additional pending

VII. Research Subcommittee Report. (Andreas Hoess)

Breakfast meeting:

2 research liaisons

Research reports publicly available for everyone

Advisory panel setup for adjustments for strategic plan of ASHRAE; now a committee; they are open for feedback via feedback form; can coordinate with Andreas for feedback.

Having a workshop for subcommittee chairs.

ASHRAE promotion campaign – erased 8.2 million dollars

ASHRAE service awards – 2 people were awarded;

They encouraged application nominations thus reach out to Andreas if nominations available.

Research – 46 active research projects; 2025-26 budget: 4.012 million dollars

Not many RTARS nor WS submitted; 1 got conditionally approved and 2 rejected
6 under review

What to write for RTAR: people had issues with RTARs thus mentorship is offered or you can be a mentor (reach out to Andreas)

submission deadline: March 15th

PTAR – Industrial heat pump sizing and guideline (coordinating with Andy Campbell)

RTAR – Lane Loyko and Doug Scott

A. RP-1703 (Testing the Performance of Vapor Retarder Systems Used with Mechanical Insulation Systems in Below-Ambient Applications).

1. Co-sponsor with TC 1.8 (lead committee).

2. Charley Petty (lead) and Gordon Hart (contributors).

Doug Scott – still open

Last progress report received – Sept 24th. Nothing from PI in a while.

Alec Cusick – testing lab had issues last year due to equipment going down and 2 samples didn't have accurate thickness measurements, thus retesting required.

Over weeks, wrapping up testing of samples; 1.8 will review test report in next 3 months; need to have it approved by end of May and no cost extension requested in June.

B. RP-1721 (Oil Return and Retention in Unitary Split System Gas Lines).

1. Co-sponsor with TC 8.11 (lead committee).

2. Gordon Struder is on PMS.

Per Doug, done and published

C. RTAR-1871 (Hygrothermal Modeling of Below Ambient Pipe Insulation)

Systems in Buildings and Refrigeration).

1. Co-sponsor with TC 1.8 (lead committee).
2. Manfred Kehrner and Gordon Hart are authors.

Time out and pulled off the list; WS deadline past 2021.

Delete it for now

D. RTAR-1513 (old) Liquid/Vapor Separation in Vessels.

1. Originated in TC 10.1.
2. Andreas Josef Hoess coordinating effort to revamp this RTAR.
Outcome of several meetings: split this between ammonia and CO2 due to a lot of drivers in CO2. Differences in two refrigerants.
Andreas: Still need more work on this.
Doug: CO2 mostly in supermarket but not much work done industrial related.
Joe Sanchez: CO2 flash vessels need a better understanding in the industry.
More discussion between Bruce Nelson and Doug Scott/Joe Sanchez
Eric: IAR willing to be to co fund this project.
Doug: Looking for people to help (Bruce volunteered)

E. Industrial Heat Pump Design Guide

1. Working group of TC 10.1 and other volunteers
2. Andreas Josef Hoess PTAR developed and submitted.
No published guideline on components of industrial heat pumps; setup a PTAR for publishing designing the system
PTAR submitted and waiting for feedback.
Doug Scott suggested to submit to the research liaison (He is on RAC) since it was not received by them, per Doug. (Deadline: March 15th)
Coordinate with Andreas and/or Wenbin.

VIII. Program Subcommittee Report.

Greg not available

IX. Old Business.

- A. Action Items.
1. Update roster and activity forms.

X. New Business.

- A. Review and approval of TC 10.1 ASHRAE Refrigeration Handbook chapters -
They have all been approved
- B. Identify reviewers for ASHRAE Refrigeration Commissioning Guide for
Commercial and Industrial Systems.(Andy Campbell to update committee) -

Current condition of guide is difficult; more tied to commercial.
Content more commercial commissioning document; not much of a guide as much as it's a sales pitch.

More improvements

ASHRAE to try to improve it useful for end users>

Andy looking for volunteers to help update this

Meeting by end of February for discussion

Danny Halel volunteered and so will Karthik Patel.

Free download available on ASHRAE website, per Doug Scott.

Dan Snyder available to help.

- C. Bruce Nelson Sustainability of Cold storage (REF-CC): Refrigeration committee determined start development of new position document (BOD approved document expressing views of society of specific topic related to public policy) No position document on cold chain, thus REF drafted purpose and go to BOD for approval of new position document.

TPS being developed; part of process is developing list of potential committee members on development committee for position document. Bruce invited to those in cold chains for involvement. Participation of development committee stressed by Bruce.

- D. California Refrigeration regulations (Title 24) – Ryan Swanson
Doug and Ryan are part of utility funded team to improve California regulation of refrigeration systems.

Energy code regulations need to be further clarified

Holding an open to public stakeholder meeting; meeting pending but probably in March

Variable vol of screw compressors above 150 hp

Fan powered evaporators – compliance with AHRI 420

Condenser TD requirement

Trans CO₂ – strong language promoting adiabatic condensers but no credit to ejectors or others that could be part of Trans CO₂; more emphasis on new technologies.

Doug: CO₂ condensing units (numerous vendors of condensed units), thus needing exemption of classification of product and what needs to meet mandatory regulations, etc.

Reach out to Doug and Ryan.

XI. Next Meeting: 2026 ASHRAE Annual Conference Austin, TX; June 27 – July 1, 2026.

1. <https://www.ashrae.org/conferences/ashrae-conferences>
2. Virtual and face-to-face!

XII. Adjourn.
Kartik first, Heather second
7-0-0