

# **ASHRAE TC 10.1**

## **Custom Engineered Refrigerant Systems, Piping, Controls and Accessories**

### **ASHRAE 2024 Winter Conference – TC 10.1 Meeting Minutes**

**January 23, 2024 ~ 1:00 – 2:30 pm CST (UTC -6)**

**Marriott Marquis Chicago ~ Meeting Room: Analysis (2)**

To: Members and guests of TC 10.1

From: Steve Sanders, TC 10.1 Chair

Date: January 23, 2024

#### **I. Preliminaries.**

A. Call to order. Started at 1:01 p.m. CDT

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.

1. *Confirmed that TC 10.1 has reached quorum for this meeting.*

<b>Name</b>	<b>Position</b>	<b>End Date</b>	<b>Position</b>
1. Steve Sanders		6/2027	Chair
2. Wayne Borrowman		6/2026	Handbook Subcommittee Chair
3. Tom Wolgamot		6/2024	Program Subcommittee Chair
4. Alec Cusick		6/2026	Research Subcommittee Chair
5. Andy Schoen		6/2026	Webmaster
6. Kent Anderson		6/2027	
7. Kartik Patel		6/2026	
8. Heather Sharif		6/2027	
9. Gordon Struder		6/2024	
10. Martin Timm		6/2026	

#### **II. Additions/changes to agenda.**

A. *Steve Sanders talked about housekeeping regarding the name change of the committee – looking at website and update with name listing on ASHRAE for this TC; per Andy Schoen, it's out of his control.*

- B. *Steve Sanders mentioned about coordinating with ASHRAE about the name. Per Wayne Borrowman and Steve Sanders, need some discussion; Doug Scott mentioned about making motion to TAC.*

### **III. Review and approval of 2023 Annual Conference draft minutes.**

- A. 2023 Annual Conference committee meeting draft minutes have been previously distributed and are being mailed with this agenda.
- B. *Motion to approve TC 10.1 2023 Annual Conference minutes (motion passes with no objections or abstentions). Heather Sharif motioned, and Kartik Patel seconded.*

### **IV. Chair's Report (Steve Sanders).**

- A. Eight (8) officers, five (5) of whom are voting members.
- B. Ten (10) voting members (VM).
1. Gordon Struder and Tom Wolgamot will roll off as VM after June 30<sup>th</sup>, 2024
  2. Program Subcommittee chair is also vacant
- C. Twenty-Two (22) corresponding members (CM).
- D. Eleven (11) provisional corresponding members (PCM).
- E. Total of (51) members.
- F. *Steve Sanders will circulate the slides (ASHRAE board approved GTIC); Decarbon task force update on activities, which are successful; goals of 2030 to have to 2050 greenhouse gas emissions, all new building net 0 by 2030; existing building by 2050*
- G. *Guidance on programs – can be helpful for new program subcommittee chair.*
- H. *Danny Helal had asked for programs relating to Low GWP refrigerants; Danny had asked Low GWP for co-sponsor and if program chair should coordinate with Danny.*
- I. *10.1 will be shifting to basecamp reliably; all memberships should be with basecamp; utilize it with communications. Adnan asked Steve for contact who handles basecamp.*
- J. *Doug Scott: RAC chair at TAC council operations committee meeting said in section 10 chair breakfast and have committee/strategy on planning; Steve mentioned about strategic planning and brainstorming; the chair should coordinate about future planning and growth for ASHRAE. Per Doug, the RAC chair mentioned about potentially establishing a committee.*

### **V. Liaison Reports.**

- A. Section 10 Head – Gursaran Mathur ([SH10@ashrae.net](mailto:SH10@ashrae.net))
1. *GD Mathur (Virtually) – GTIC has already mentioned; roster excel spreadsheets; ASHRAE is creating a new database to TC chairs but was delayed by 2 weeks. Should be simple to take rosters actively.*
  2. *ASHRAE Government Affairs activities and successes were discussed.*
  3. *There was discussion about applying for ASHRAE fellowship; nominating people in this committee. Deadline is May 31<sup>st</sup>; should decide on who should be nominated as fellow.*
  4. *Hightower award – for certain sections; this committee should start looking into that.*

5. *Had brought about how many members within the committee have attended their ASHRAE local chapters? GD Mathur addressed about the lack of involvement in local chapters, thus encouraged to get involved in local chapters. Activity form should be completed by today.*

B. Other Societies.

1. ASHRAE 15 (Greg Scrivner)

- a. *Greg has been updating to 2024 to align better with the codes; A2L is closer to resolution. There were healthy debates on refrigerating vs. refrigeration. The Standard decided to revert to refrigerating. The scope has changed.*
  - i. *Addendum A – BPV is now updated.*
  - ii. *Addendum B – capacity relief calc.- ppr 2 is coming out soon. Refrigeration committee had discussed about retrofitting commercial refrigerating units when switching safety groups, which is to be into a public review.*
  - iii. *Addendum I will be published to add local design requirement of refrigeration system to 500 microns.*
  - iv. *Addendum J is supposed to vote but not ready (clarification of use of A3s in industrial occupancy); allow freeze w/o authority juris, which created a loophole.*  
*Addendum M is out for public review*
  - v. *Addendum T is out for 4th public review.*
- b. *ASHRAE 34 – long conversation of safety class. (A vs B); Refrigerant TCs has proposed study of what options for modifying classifications. Increase desire to use non-refrigerant components in blends.*
- c. *ASHRAE 15 involved in interpretation of 6" vessels.*

2. ASME (Jim Caylor).

- a. *There had been multiple reviews of ASME B31.5; ASME B31.8 has expanded to cross-country CO2 pipelines. CO2 is considered toxic and ASHRAE 34 is used to knock off toxic classification; per Jim Caylor, the changes had been accepted.*

3. CSA (Wayne Borrowman).

- a. *CSA B52 had embarked on alignment with ASHRAE 15; driven by H2L issue. Over 2 years, significant changes were made with CSA B52; it has now been more aligned with ASHRAE 15 than before. Examples of changes are multiple references to IIAR-2 for guidance for additional info.*
- b. *New section in CSA B52 talks about de-commissioning and dismantling of equipment due to some deaths. It is difficult to get something mandatory and references are available for safety authorities.*
- c. *ASHRAE 34 – CSA B52 had difficulty to keep up with the changes of ASHRAE 34 in terms of classification; now ASHRAE 34 has been bundled with CSA B52.*
- d. *Discussion about additional clarifications of avoiding possibility of solid CO2 in refrigeration systems. Stress corrosion cracking for ammonia vessels in CSA*

*B52 is to be addressed as of 2023.*

- e. *Due to an incident a few year backs, requirements of refrigerant leak in secondary refrigerants circuit is discussed, based on the danger of ammonia system leaking with secondary units, in which the fluid was sprayed on people, (based on the Ferney incident), thus wording in B52 had been put, thus an issue that should be addressed in ASHRAE 15.*
  - f. *Discussion on clarification of relief termination on a roof, which went to public review and published last December.*
4. Other
- a. *IIAR (Eric Smith) – Eric is working on responding to comments from public review about hydrocarbon standard, though Propane standard is not listed. Efforts are ongoing to revise IIAR-2 and various other standards; IIAR-9 is almost prepared for public review thus the deadline is extended.*
  - b. *Per Eric, there is more work on condensate induced hydraulic shock; the research was done a few years ago and is an addenda to that. The conclusion is about providing guidance on how rate of introduction of hot gas to cold equipment should be controlled, which led to questions regarding motorized hot gas valve to monitor rate. A lot of industrial systems have hot gas valves, thus the goal of the research project to considering how much mass flow rate is acceptable to prevent condensate induced hydraulic shock.*
  - c. *There is prospective research of potential of dry ice forming in CO2 piping, what conditions, etc. and how to prevent it. Per Eric, there may be work with University of Berkeley (3 year project proposed on geometry, heat transfer, various facets).*
  - d. *IIAR Conference is in March in Orlando, Florida.*
  - e. *Andy Pearson and Kent Anderson will give a panel of historical perspective of ammonia refrigeration, especially with respect to IIAR and major technological developments along the way.*
5. Insulation societies. (Alec Cusick)
- a. *NIA (National Insulation Association) – Per Alec, there are existing standards on website and may need to expand more. An Online resource is needed to have a better picture.*
  - b. *ASTM – Per Gordon Hart, the ASTM F25 committee has two new specifications; one for LNG on ships and other on insulation, piping and equipment; type C tags for fuel LNG on ships.*

## **VI. Handbook Subcommittee Report (Wayne Borrowman).**

- A. *Handbook chapters – The 2026 is the next edition. Wayne is asking for volunteers to review chapters and have different perspectives.*
  - 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).*

- i. *This will include halocarbons and hydrocarbons together. Bruce Herlemeyer is making good progress on that. Existing halocarbons chapter is more than 40 years old, thus the need to clean up halocarbon section. The goal is to make significant changes in that chapter.*

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

- i. *Per Doug Scott, Chapter 5 should be worked on and has asked for volunteers.*
- ii. *Per Kent Anderson, Daniel Colburne of UK may be a good resource for adding hydrocarbons for Chapter 1 (Andy Pearson knows him).*
- iii. *Andy Pearson raised concerns about putting hydrocarbons into halocarbons. Per Andy, it may be an uphill task to combine hydrocarbons and halocarbons into one chapter. Per Wayne, information is to be gathered and should concentrate more on format instead of content. Wayne suggested to concentrate on the technical content and simultaneously concentrate on structured change.*
- iv. *Steve Sanders suggested prioritization of content with appropriate guidelines.*
- v. *Heather Sharif and Kartik Patel volunteered and David Snyder volunteered to help and review the various chapters listed in refrigeration. Per Andy, Daniel Colburne can contribute but not so much on areas that may be needed for the scope of the chapters. Per Kent Anderson, the marketing institute may be helpful for large systems.*

- c. *Chapter 45 (Concrete Dams) – should definitely be improved for clarification; per Doug, it should have more references.*

**VII. Research Subcommittee Report (Alec Cusick; project author/leader).**

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).
- 3. *Per Alec Cusick – 80% of the way of getting data so far. The goal is to finalize by June 30th and then get the final research report. TC 1.8 is to ask for a 12 month no-cost extension.*

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

- 1. Co-sponsor with TC 8.11 (lead committee).
- 2. *Per Doug Scott – 9 out of 10 payments have been made and the TC needs approval by April 2023, thus assumed to be done. Gordon Struder is on PMS.*
- 3. *Gordon Struder had finalized report and is to be submitted for approval.*

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.
3. *Per Alec Cusick, the RTAR was submitted in 2018 by TC 1.8 and co-sponsored by 10.3 (at the time). However, the RTAR was rejected by RAC since it was dependent on data from RP-1703. TC 1.8 is to hold off submitting until they get data from RP-1703. It is believed that they will get most of the data from RP-1703. TC 1.8 is to resubmit the RTAR by this year. Over the summer meeting, Alec will bring the revised RTAR to this committee's attention, which is based on the modeling of data from 1703. Per Gordon Struder, Alec will handle TC 1.8, thus Alec will be resubmitting the RTAR.*
1. *Per Gordon Hart – the project is ongoing (80% done). The testing by R&D is to be done by June 30th but may get a no-cost extension; Gordon believes it may take a year for approval. Per Alan Neely, the project been ongoing for a decade, but will give a completion deadline until the 2025 ASHRAE Annual Conference in Phoenix.*

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

1. *This RTAR lost traction over the years; a preliminary task force was set for meetings to redraft the existing RTAR for relevance; the committee is to have the draft ready to vote for submission by summer meeting. August 15th is the deadline for consideration from RAC.*
2. *Doug Scott mentioned challenges of the nature of what's coming in and out of vessel and what various compressors will accept. There was a challenge with compressors manufacturers of what's going out of the vessel, what's acceptable if transient or steady state flow or large droplets or fine droplets, etc. Recently, input is no CFD and instead doing some testing. Joe Sanchez (guest) suggested that it should be based on real life experiences. He agreed to help out and so has Davide Ziviani.*
3. *Alec Cusick mentioned pending responses on being part of it, but Jim Caylor and Doug Scott were available for review to go to RAC. Per Alec, in a month or two, the first task force meeting will start the redrafting process so that by summer, there will be something for the committee to vote for RAC submission.*
4. *Joe Sanchez suggested having TC 8.1 members onboard for further discussions regarding compressors and fraction of liquid intake, etc.*
5. *Alec mentioned an ongoing PTAR in regards to developing a heat pump design guide. The draft is to be developed for the benefit of the industry. He also mentioned about on ongoing discussion on the next research initiatives regarding the need for acoustic insulation systems on refrigeration piping specifically. Gordon Struder had mentioned that he has heard of anything yet.*
6. *Alec Cusick also mentioned that protecting society from piping carrying hydrocarbons is in discussion.*

**VIII. Programs (Tom Wolgamot).**

- A. *Due to absence of Tom Wolgamot, no discussion made about the programs.*
- B. *Steve Sanders mentioned that Tom Wolgamot will be rolling-off as TC 10.1 Programs Subcommittee Chair and we are in need of a volunteer to take-over. Steve will be reaching-out to pursue potential candidates; however, anyone potentially interested should contact Steve Sanders.*

**IX. Old Business.**

A. Action Items.

1. Update roster and activity forms.
2. Review code of ethics and update website biographical information.

**X. New Business.**

A. *Update (correct) the name of TC 10.1 on the ASHRAE website.*

B. *PTAR development for Industrial Heat Pump Design & Application Guide*

1. *There is a concern that mechanical designers have not specified operating temperatures and providing specs for insulation systems in industrial heat pump applications and how to resolve that.*

**XI. Next Meeting: Indianapolis, IN; June 22-26, 2024.**

A. <https://www.ashrae.org/conferences/2024-annual-conference-indianapolis>

B. JW Marriott - Indianapolis, 10 S. West St., Indianapolis, IN 46204.

1. Registration link opens in March 2024.

C. Virtual and face-to-face!

**XII. Adjourn.**

- A. *Motion to adjourn (motion passes with no objections or abstentions). Wayne motioned to adjourn and Heather seconded. Meeting ended at 3:10 p.m.*