



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. 3.2 DATE June 22, 2021

TC/TG/MTG/TRG TITLE Refrigerant System Chemistry and Contaminant Control

DATE OF MEETING June 22, 2021 – 2:00 to 4:30pm (EST) LOCATION Virtual Meeting

Name	Affiliation	Participation
Voting Members		
Joe Karnaz - Chair	Shrieve	Present
Elyse Sorenson – Vice Chair	Trane	Present
Steve Baker - Secretary	Emerson	Present
Rob Yost - Standards	National Refrigerants	Absent
Greg Smith - Handbook	Honeywell	Present
Ivan Rydkin - Handbook	Daikin	Present
Dave Vincent - Webmaster	BVA	Present
Casey Scruggs - Research	Metalloid	Present
Julie Majurin	AHRI	Present
Roberto Urrego	Lanxess	Present
Rosine Rohatgi	Spauschus	Present
Jian Sun-Blanks	Chemours	Present
Sarah Kim	Arkema	Present
John Senediak	Intertek	Absent
Valerie Lisi	Carrier	Present
Danny Halel	NTHALP Engineering	Absent
Justin Allemann	Parker Hannifin	Absent
Non-Voting Members		
Brad Boggess - Programs	Emerson	Present
Rashid Zakeri – MTG Sustainable RAC	Circle Proscio	Present
Marc Scancarello – MTG Low GWP	Emerson	Absent
Chris Campo - ALI	Shrieve	Present
DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:		
TAC Section Head: Stuart Dols	SH3@ashrae.net	
All Committee Liaisons As Shown on the TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	Steve Kujak – Research Don Fenton – Standards	
Mike Vaughn, Manager of Research & Technical Services	MORTS@ashrae.net	

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

Minutes – TC 3.2 Refrigerant System Chemistry and Contaminant Control

1) Call to Order – Joe Karnaz

Chair Joe Karnaz called the meeting to order at 2:00 pm on Tuesday, June 22, 2021. In response to COVID 19 pandemic, ASHRAE exercised abundant caution and replaced “in-person meetings” with virtual meetings conducted online using the Zoom web application. Guests were recognized and welcomed. All meeting participants were invited to sign in using the Chat function to provide their name and email address.

2) ASHRAE Code of Ethics – Chair Joe Karnaz shared with all members and guests the Code and that it is to be adhered to whenever at an ASHRAE meeting.

3) Confirmation of Quorum - In lieu of self- introductions, a roll call of the voting members was taken, and a quorum was confirmed with 13 of 17 voting members present.

4) Approval of Agenda

MOTION #1: to approve the 2021 Annual Virtual Meeting Agenda was made by Dave Vincent and seconded by Roberto Urrego. Motion passed 12-0-0 CNV.

5) Approval of 2021 Winter Virtual Meeting Minutes

MOTION #2: to approve the 2021 Winter Virtual Meeting Minutes was made by Julie Majurin and seconded by Greg Smith. Motion passed 12-0-0 CNV.

6) Report on TC 3.0 Chair Breakfast Meeting – Joe Karnaz

- TC Chairs Breakfast and Training meeting was held as a virtual meeting for the various Functional Groups (FG) representatives
- Breakout meetings with Section Heads are being held separately; It was decided between the Section 3 Chairs and Section Head Stuart Dols that Section 3 was not in need of breakout meetings
- With groups becoming more accustomed to virtual meeting TAC has suggested that FG try to hold extra meetings through the year outside of the winter and annual meetings; ASHRAE will list these interim meetings on the website; more discussion during our meeting
- Statistics were given on the FG Evaluation Forms that were submitted after the winter meeting; Most of the 8 categories fell in the Green except for FG “Objectives” had 85% listed is either Yellow or Red; TC 3.2 fell mainly in the green in the evaluation
- TAC Motion Form – testing this out, new way of submitting a motion to TAC for consideration
- “Open Mic” TAC meeting ASKTAC@ASHRAE.net express concerns and ideas
- Decarbonization Task Force has been started
- ASHRAE Strategic Plan has been extended one more year to 2025
- Las Vegas meeting programs deadline July 12th; Program site is www.ashrae.org/conferences/2022-winter-conference-las-vegas Tracks 3 and 8 related to Section 3 activities
- FGs encouraged to use the ASHRAE Basecamp for information storage and distribution

7) Liaison Comments:

- Stuart Dols – Reminded TC that Activity forms were due June 18th. Roster update completed and accurate.

8) Sub-Committee Reports

Programs – Brad Boggess

- Joe Karnaz updated on Seminar 52 sponsored by TC 10.7 titled “Latest Developments in Low GWP Refrigerants and Systems for Refrigeration”. On-demand session available through ASHRAE registration. Seminar 79 was co-sponsored by TC3.4 and titled “Working Fluid and Application Considerations for Ultra Low Refrigeration” was also an On-demand session.
- Proposed list of topics and speakers for 2022 Winter Meeting in Las Vegas next January. Reviewed following topics for a seminar
 - Chair: Rashid Zakeri volunteered. Thank you!
 - AHRI 9016 Update, ASHRAE97 testing of LGWP refrigerants, multiple phases. Overview from Xudong Wang of AHRI, testing update from Elyse Sorenson and/or Morgan Leahey of Trane. Sorenson to review whether 2 presentations for testing are appropriate and will advise.
 - Ivan Rydkin tentatively proposed a presentation on R1132(E) refrigerant.
 - Odorants study by Rosine Rohatgi. Will review for presentation (tentative).
 - Contaminant Control – Karnaz and Boggess to check with Parker Hannifin and Emerson White Rogers. Want to maintain the former TC 3.3 aspect in this new TC.
 - Purdue 2021 papers to be reviewed for seminar by Boggess, Karnaz.
 - **MOTION #3**: Karnaz proposed seminar title as “System Stability and Contaminant Control with Lower GWP Refrigerants” with Rashid Zakeri as chair. Motion made by Sarah Kim and seconded by Dave Vincent. Motion passed 12-0-0 CNV.
- Upcoming paper and deadlines reviewed for 2021 Winter Meeting. Confusion on when conference papers due; two dates stated, July 12 and August 6. Boggess to follow-up for clarification (Billy Austin)
- Boggess briefly reviewed programs for 2022 Winter Meeting from TC3.1, TC3.4, TC3.8.

Handbook – Greg Smith, Ivan Rydkin

- Chapter 6 *Refrigerant System Chemistry* – **Greg Smith**
Chapter is updated. Thank you, Ed Hessell, Brad Boggess, and Rosine Rohatgi. Main updates were ASHRAE research. Went to TC for review in April, letter ballot in May and approved with editorial comments. Comments addressed and chapter was submitted to ASHRAE on May 26th.
- Chapter 7 *Control of Moisture and Other Contaminants in Refrigerant Systems* – **Ivan Rydkin**
Chapter updated. Thank you to Kelsey and Shelby Kent. Submitted to ASHRAE in early June.

Karnaz thanked Smith and Rydkin for their leadership efforts and the TC for the timely review and approval. Going forward, Karnaz proposed a chair and vice-chair leadership. Rydkin agreed to be the Handbook chair; Karnaz requested those interested in a vice-chair position to let him know.

Standards - Rob Yost (presented by Joe Karnaz)

- GPC 38 – Metal Pressure Vessel Method to Test Materials Used with Refrigeration Systems
Reaffirmed at 2021 Winter meeting.
- SPC 97 – Sealed Glass Tube Method to Test for Chemical Stability of Materials for Use Within Refrigerant Systems
 - Chris Seeton – Will send to group for review and vote.
- SPC 35 – Method of Testing Desiccants for Refrigerant Drying
 - Potential issue. Meeting has yet to be called, follow-up with chair.
- SPC 63.2 – Method of Testing Liquid Line Filter Drier Filtration Capacity
 - No action required.
- SPC 78 – Method of Testing Flow Capacity of Suction Line Filters and Filter Driers
 - No action required.
- SPC 219 – Method of Testing Acid Filters
 - No update. Presumably reported at 2021 Winter meeting by John Senediak, the final draft was reviewed on Monday, February 1, 2021 and moved forward.
- New Ideas
 - TC3.1 is working on Guideline 6 on Material Compatibility. Lauren Hoffman, is the chair and will schedule meeting to review/develop plan.

Research – Casey Scruggs

Combined ASHRAE Research mtg held on June 9th, 2021.

- **RTAR 1856** – “*Determine the Effect and Allowable Limits of Moisture and Contaminants in CO2 Systems*” Led by Ivan Rydkin, Draft Work Statement is complete, ready for review and submittal by August 15th, 2021 deadline.
- **RTAR 1886** – “*Kinetic and Mechanistic Studies of the Breakdown of HFO Refrigerants*” Led by Elyse Sorenson. RTAR accepted with comments. Draft Work Statement due August 15th, 2021.
- **RTAR 1897** – “*HFO Refrigerant Compatibility with AGED Lubricants and Contaminants*” Led by Joe Karnaz, RTAR accepted with comments. Project on hold pending funding availability. Work statement to be created for committee review at 2022 Annual Meeting, deadline for Draft WS is March 2022.
- **WS 1790** – “*Distribution of Water between Vapor and Liquid Phases of Low GWP Refrigerants*” Lead by Brad Boggess. Conditionally approved by RAC. Boggess and Chee to review updates submitted so the project may be sent out for bids.

New Ideas: Joe Karnaz urged the TC and the Research Programs to review and look for gaps in current studies that would be opportunities for new research projects. Ivan Rydkin mentioned in a gap exists in Chapter 7 due to the lack of water vapor data/water capacity for HFO refrigerants, potential research topic.

Webmaster – Dave Vincent

- Website is up to date.
- Chair Joe Karnaz reported TC3.3 information is no longer available on the TC3.2 website and asked Dave to consider how to recover TC3.3 information/identity. TC3.2 scope on website is modified.
- Karnaz thanked Vincent for managing the TC3.2 website, one of the best ASHRAE TC websites.

9) MTG Lower GWP Refrigerants - Marc Scancarello (presented by Joe Karnaz)

- Last MTG meeting was April 1st, 2021.
- Research
 - RP1774 - *Incorporation of Odorants in Flammable Refrigerants*. Complete with report.
 - RP1884 – extension of RP1774. Rosine Rohatgi reported testing of several odorants with R32, R1234yf, R290 refrigerants; additional odorants to be tested.
 - RP1806 - *Flammable Refrigerants Post Ignition Simulation and Risk Assessment*. Pilot study is underway.
 - RP1855 - *Determination of the Impact of Combustion Byproducts Hydrogen Fluoride (HF) and Carbonyl Fluoride (COF₂) on the Safe Use of Flammable Fluorinated Refrigerants*. In progress, expected to be completed in 1st half of 2021.
 - TRP 1879 – *Foamability Properties of Low GWP Refrigerants in Oil Mixtures*.
- Programs – led by Danny Halel. List of Research and Standards work discussed for 2022 Winter Meeting. May co-sponsor with TC3.2

10) MTG Sustainable RAC – Rashid Zakeri

- Attended last two meetings. Reviewed status of 9 handbook chapters on topic; content is complete by authors and ready for formatting.
- Refrigeration content for this MTG limited to reclamation best practices.
- Next meeting scheduled for late July 2021 and follow-up in September.

11) Membership – Joe Karnaz

Name	Term
Joe Karnaz - Chair	2023
Elyse Sorenson – Vice Chair	2022
Steve Baker - Secretary	2021
Rob Yost - Standards	2021
Ivan Rydkin - Handbook	2024
Dave Vincent - Webmaster	2021
Casey Scruggs - Research	2023
Julie Majurin	2023
Greg Smith	2024
Rosine Rohatgi	2022
Jian Sun-Blanks	2022
Sarah Kim	2021
John Senediak	2022
Valerie Lisi	2022
Danny Halel	2021
Justin Allemann	2024

- Voting members rolling off in 2021 are: Steve Baker, Rob Yost, Knut Petry, Dave Vincent, Roberto Urrego, Sarah Kim, and Danny Halel.
- New voting members are: Brad Boggess, Ed Hessell, and Shelli Porter.
- Total voting members will be 14.

12) Old Business – Joe Karnaz

- Revisited the topic of having vice-chairs for each of the sub-committees. ASHRAE doesn't formally allow but TC3.2 could adopt the use of vice-chairs on an informal basis. Advantages of having vice-chairs for sub-committees are
 - Provide mentorship/training for new members interested in TC leadership by experienced subcommittee chairs
 - Serve as a backup in the event the chair is unavailable
 - Vice chair would roll on as the chair after a period time, i.e. 2 years, and new vice chair would be named. Eliminates the “forever” chair practice that is prevalent.
- Sub-committee chairs going forward in combined TC3.2 are
 - Programs – Brad Boggess
 - Research – Casey Scruggs
 - Standards – Rob Yost (one more cycle!)
 - Handbook – Ivan Rydkin.
- Will discuss the use of Vice-Chair positions within TC3.2 more at 2022 Winter Meeting in Las Vegas.

13) New Business – Joe Karnaz

- At Breakfast Chair mtg, ASHRAE encouraged TCs to meet more than at the Winter and Annual meetings. For TC3.2, subcommittees are meeting as required and have been effective.
- 2022 Winter Meeting scheduled in Las Vegas, NV from January 29th to February 2nd.
- 2022 Annual Meeting scheduled in Toronto, CAN from June 25th – 29th.

14) Adjournment – Joe Karnaz

The meeting was adjourned at 3:45pm pm through a motion by Julie Majurin.

Respectfully submitted,

Steven Baker – Secretary