



**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. 3.4 DATE March 21, 2022

TC/TG/MTG/TRG TITLE Lubrication

DATE OF MEETING February 1, 2022 – 3:30 to 6:30pm (PST) LOCATION Las Vegas, NV / Virtual

Name	Affiliation	Participation	
		Present	Absent
Voting Members			
Greg Smith - <b>Chair</b>	Honeywell	X	
Casey Scruggs – <b>Vice Chair, Handbook</b>	Metalloid	X	
Joe Karnaz – Secretary (not for this mtg)	Shrieve	X	
Ivan Rydkin - <b>Handbook</b>	Daikin	X	
Sheli Porter - <b>Standards</b>	Stellar Laboratories	X	
Dave Vincent - <b>Webmaster</b>	BVA	X	
Steve Kujak	Trane	X	
Rob Yost	National Refrigerants		X
Julie Majurin	AHRI	X	
Ed Hessell	Lanxess		X
Raymond Drost	Calumet	X	X (5:25pm)
Steve Baker – <b>Secretary (Acting)</b>	Emerson	X	
Non-Voting Members			
Scott Wujek – <b>Research, ALI</b>	Apple	X	
Chris Campo - <b>Programs</b>	Shrieve	X	
Danny Harel – <b>MTG Low GWP</b>	NTHALP Engineering		X
Rashid Zakeri – <b>MTG Sustainable RAC</b>	Circle Proscio	X	
DISTRIBUTION: <i>All Members of TC/TG/MTG/TRG plus the following:</i>			
TAC Section Head: Stuart Dols		SH3@ashrae.net	
All Committee Liaisons As Shown on the TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)		Chee Sheng Ow – Research Gerald Kettler – Standards	
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.**

## Minutes – TC 3.4 Refrigerant System Chemistry and Contaminant Control

*Please note – to accommodate some scheduling overlap of the TC 3.2 seminar (AHR Expo Session 4) and TC 3.4 committee meeting along with timing of the virtual meeting for people on the east coast, the chairs of TC 3.2 and TC 3.4 have met and decided to run a combined meeting for common topics with separate TC related discussions to meet during the previously scheduled TC 3.2 timeslot plus one additional hour. The agenda sent out for TC 3.2 will also reflect this combined meeting.*

### **1) Call to Order – Joe Karnaz**

Chair Joe Karnaz called the TC 3.2 and 3.4 combined meeting to order at 3:30 pm on Tuesday, February 1, 2022. Chairs Joe Karnaz and Greg Smith (TC 3.4) introduced themselves and welcomed those attending in person and online. This meeting was also held virtually via the Zoom web application to accommodate those that could not attend in person.

A sign-up sheet was circulated among the in-person attendees and online attendees were requested to sign in using the Chat function to provide their name and email address.

### **2) ASHRAE Code of Ethics – Greg Smith**

TC 3.4 Chair Greg Smith shared with all members and guests the Code of Ethics and that it is to be adhered to whenever at an ASHRAE meeting. Greg Smith also introduced ASHRAE's new Commitment to Care and stated its details are available on the website.

**3) Confirmation of Quorum** - For those present in person, self-introductions were done. Roll call of voting members online was conducted, and quorum was confirmed with 10 of 12 voting members present.

### **4) Approval of Agenda – Greg Smith**

**MOTION #1:** to approve the 2022 Winter meeting agenda was made by Ivan Rydikin and seconded by Dave Vincent. Motion passed 10-0-0 CV.

### **5) Approval of 2021 Annual Virtual Meeting Minutes**

**MOTION #2:** to approve the 2021 Summer Annual Virtual meeting minutes for TC3.4 was made by Julie Majurin and seconded by Steve Baker. Motion passed 10-0-0 CV.

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

- TAC has implemented a few changes over the last 6 months with focus on providing more training on getting TC vice-chairs more prepared for transition to chair
- Introduced 7 one-hour virtual training sessions that has reduced meeting time in Las Vegas by 50%
- “Getting on the ladder” succession planning – develop ways within TC to advance the process of new chairs through involvement in other committees; routes can vary from TC to TC
- Emphasis was placed on maintaining balance within the TCs
- Encouraged to have more interim meetings during the times between meetings
- Face-to-Face meeting planned for Toronto June 25 – 29, 2022;  
<http://www.ashrae.org/conferences/2022-annual-conference-toronto>
- Program tracks and chairs for Toronto announced. Track 1-3 more pertinent to Section 3; Program proposals due February 17, 2022
- Statistics
  - Research - 918 projects since 1960 at \$77 million; ~50 current

- Standards – 131 Active; 15 Under development
- Guidelines – 29 Published; 8 Under development
- Handbook – 209 Chapters
- Program Presentations – (Annual) 660

## 7) Liaison Comments:

- Chris Seeton (filling in for Chee Sheng Ow, RAC). \$12M funding expected this year to kickoff Research, 26 projects in queue representing 2+ years of projects ready to go. With this backlog, this indicates a Project Work Statement started today may not have its final report for 4-5 years. Foamability project (Scott Wujek, Chris) with bidder selected will be pushed to have it funded and started; Chris requested Scott to verify bids (due to funding freeze) are still valid and current; or require updating. Requested projects requiring Work Statements to be sent to Chris by March for a RAC vote.
- Stuart Dols, Section 3 Head. Stated the TC Activity and Functional forms are due to him asap, have TAC mtg tomorrow morning (2/2). Requested TC chairs to involve vice-chairs when updating online rosters; rosters are to be complete by 2/15 and saved only, not submitted. Rosters are submitted after approval by Section Head and TAC, due 2/28. Joe acknowledged and thanked Stuart for his support in making the roster changes (emergency) necessary; Joe to remain TC chair for one more year and work with Valerie Lisi (new TC Vice Chair, replaced Elyse Sorenson).
- Chee Sheng Ow, RAC, joined later and had nothing to add to Chris Seeton's liaison report.

## 8) Sub-Committee Reports

### Programs – Chris Campo

- Greg Smith reported on Seminar 18 sponsored by TC 3.4 “Lubricants for New Low GWP Refrigerant Candidates”. Good turnout, 40-50 attendees. Greg thanked the speakers Joe Karnaz and Ramesh Navaratnam for their presentations.
- Discussion of Future Programs
  - Atlanta 2023 ideas
    - Steve Kujak and Joe Karnaz proposed updates from the AHRTI Project 9016 for the material compatibility testing of HFC and HFO refrigerants.
    - AHRTI 9016 project updates planned for Purdue Conference 2022; consider presenting again.
    - Mini conference with TC3.1 or combined section 3.
    - Submission for program topics for Atlanta 2023 meeting likely due late July/early August 2022.

### Handbook – Casey Scruggs

- Chapter 12 – Handbook subcommittee reviewed and determined no revisions or changes were necessary. A new section, an introduction, was created for LGWP refrigerants and is being reviewed by subcommittee. This introduction and information from the current AHRTI Project 9016 will be considered for the next revision due 2026.
- Casey invited those interested in joining the subcommittee to contact him.

### Standards – Sheli Porter

- GPC 40 – Refrigeration Oil Description

- Scott Wujek reported updates completed and ready for review.
- SPC 86 – Methods of Testing the Floc Points of Refrigeration Grade Oils
  - Brad Boggess reported updates nearly complete and ready for review, Brad to schedule meeting to review.
  - Ivan Rydtkin questioned method for mineral oils, still used for R22. Brad stated SPC 172 could be used. Steve Kujak mentioned two other refrigerants today use mineral oil, R1233zd and R1224ye. SPC 86 is specific to R22 for mineral oil, R1233zd and R1224ye could use SPC 172. Same procedure used in SPC 86 and 172. This has been an ongoing discussion, 5-6 years now.
  - Discussed maintaining both SPC 86 and SPC 172 going forward; idea suggested the current updates to SPC 86 will be the last and future work will focus on SPC 172. Users are believed to still be able to reference SPC 86 in the future by noting its last revision date in its title, i.e., SPC 86-2022.
- SPC 172 – Method of Test for Insoluble Materials in Synthetic Lubricants and HFC Refrigerant Systems
  - Sheli not aware of any updates. Ed Hessell to schedule meeting w/ update for upcoming Toronto annual meeting.
- SPC 218 – Method of Testing for Lubricant and Refrigerant Miscibility Determination
  - 5-year review due; out-of-date references and few language issues.
  - Casey Scruggs volunteered to lead sub-committee group for this review. Joining him are Rosine Rohatgi, Morgan Leehey, Henna Tangri, Jian Sun Blanks, Andrew Sumner, and Ray Drost. Thank you all.
  - Joe Karnaz stated the subcommittee will be reviewed for representation and balance per ASHRAE.
  - A round-robin study is thought to have been previously performed to create a Precision & Bias statement. Subcommittee will investigate.

**MOTION #3:** to revise SPC 218, Method of Testing for Lubricant and Refrigerant Miscibility Determination was made by Joe Karnaz and seconded by Sheli Porter. Motion passed 10-0-0 CV.

- No new ideas for Standards or Guidelines.

### **Research – Scott Wujek**

- **RTAR 1879** – “Foaming Properties of Low GWP Refrigerant and Oil Mixtures”. Previously updated by Chris Seeton (acting RAC liaison). Project approved in 2020 prior to RAC’s decision to freeze research projects. Bidders to be contacted to advise if submitted bid is valid and current; if not, project will need to be sent out bidding again which could jeopardize funding.
- **RTAR 1721** – “Oil Return and Retention in Unitary Split Gas Lines with HFC and HFO Refrigerants” Chris Seeton chair, co-sponsored by TC 8.11. PI is Purdue University and currently behind schedule.
- **RTAR 1891** – “Tribological Interaction Data with Lubricants and Refrigerants” Elyse Sorenson was chair and in 2020, reported the Work Statement was nearly complete. When RAC funding was frozen, work stopped on the WS.
- **New Ideas:**
  - Chris Seeton proposed a project to determine if “Lubricant Aids in the Breakdown of Refrigerants and what GWP/ODP compounds might be produced”.

- Dielectric Properties of Lubricant/Refrigerant mixtures; related to TC 3.1 research project for determining the dielectric properties of refrigerants (Ivan Rydkin chair). For lubricant/refrigerant mixtures in TC3.4, Marc Scancarello was asked to write the RTAR assuming the project is of value.
- Identify gaps/opportunities for additional research from AHRTI Project 9016.

#### **Webmaster – Dave Vincent**

- Website is up to date.
- TC 3.2 Chair Joe Karnaz and TC 3.4 Chair Greg Smith recognized and thanked Dave for his outstanding job maintaining each TC website.

#### **9) MTG Lower GWP Refrigerants TC 3.2 and TC 3.4- Marc Scancarello**

- Full committee meeting planned for tomorrow, 2/2.
- Research
  - RP1884 - *Incorporation of Odorants in Flammable Refrigerants*. Research CPSC (Consumer Product Safety Commission) sponsored is complete. Seminar held today, 2/1, where results were presented. Research involved 7 odorants, 3 lubricants, 3 refrigerants; ASHRAE97 compatibility testing performed; odorant found for each refrigerant tested, however, not the same odorant for each refrigerant. Next phase/funding with ASHRAE to be determined.
  - RP1806 - *Flammable Refrigerants Post Ignition Simulation and Risk Assessment*. Pilot study is nearing completion,
    - RP1855 - *Determination of the Impact of Combustion Byproducts Hydrogen Fluoride (HF) and Carbonyl Fluoride (COF<sub>2</sub>) on the Safe Use of Flammable Fluorinated Refrigerants*. Report is in progress.
    - RP1879 – MTG appears to be co-sponsoring this project.
- Standards
  - A2L code changes proposed and approved during 2021 Group A development cycle. Incorporation of A2L refrigerants in 2024 appears to be on track.

#### **10) MTG Sustainable RAC TC 3.2 and TC 3.4 – Rashid Zakeri**

- Guide for Developing Markets for Refrigeration and Air Conditioning Plant Assessments
- All 9 chapters are complete and undergoing final edit.
- Meeting rescheduled for 2/12.

#### **11) Membership – Greg Smith**

- Rollover rosters are due to the Section Head by 2/15.
- 4 new voting members came on in 2021.
- For 2022, Greg Smith and Steve Kujak are rolling off. Rob Yost (retired) expected to be rolling off this year too.
  - Chris Seeton is rolling on as a new voting member.
  - Following requested to be voting members
    - Rosine Rohatgi
    - Morgan Leehey
    - Rashid Zakeri
    - Andrew Sumner
- For those interested in becoming a member, visit the TC website and sign up as Provisional Member. Provisional Members move to Corresponding Members.

#### **12) Old Business – Joe Karnaz, Greg Smith**

No new business was brought before the committee.

#### **13) New Business – Joe Karnaz, Greg Smith**

- New idea – Consider having combined TC 3.2 and 3.4 meetings in the future.
- Greg Smith reaffirmed the scopes of TC 3.2 and TC 3.4 with the meeting attendees. The scope was read to the meeting attendees

**MOTION #4:** to confirm the relevance of TC 3.4 and to reaffirm its scope was made by Casey Scruggs and seconded by Joe Karnaz. Motion passed 9-0-0 CV.

#### **14) Adjournment – Joe Karnaz, Greg Smith**

The meeting was adjourned at 5:30pm through a motion by Greg Smith.

Respectfully submitted,

Steven Baker – Secretary (Acting)