1791 Tullie Circle, N.E./Atlanta, GA 30329
404-636-8400

TC/TG/MTG/TRG MINUTES COVER SHEET

APPROVED

(Minutes of all Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/MTG/TRG No. 8.1 DATE June 26, 2019

TC/TG/MTG/TRG TITLE Positive Displacement Compressors

DATE OF MEETING June 25, 2019 LOCATION Kansas City, MO

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Dr. Michael Perevozchikov	2018	**Dr. Alex Leyderman**	2018	See Attachment 1
John Neel	2017	**Doug Collings**	2018	
James Douglas	2016	**Joe Sanchez**	2018	
Dr. Christopher Seeton	2016			
Erik Anderson	2017			
Dr. Craig Bradshaw	2018			
Scott MacBain	2017			
Rick Heiden	2018			
Eric Berg	2018			

DISTRIBUTION: ***All Members of TC8.1 plus the following:***	
TAC Section Head: Dustin Meredith	SH8.1@ashrae.net
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	See ASHRAE email alias list for needed addresses.
Mike Vaughn, Manager Of Research & Technical Services	MORTS@ashrae.net

Call to Order - Michael Perevozchikov

Michael Perevozchikov called the meeting to order at on Tuesday, June 25, 2019 at 3:31pm. Reminder to review the ASHRAE Code of Ethics (https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics).

All members and visitors present self-introduced. There were 25 total attendees at the meeting.

Establishment of a Quorum – Michael Perevozchikov

The current roster shows 12 voting members and was circulated during the meeting along with a sign-in sheet. Both are included as Attachment 1. A roll call was taken and there were 9 Voting Members present, and Michael Perevozchikov declared quorum was established.

Approval of Minutes – Michael Perevozchikov

Scott MacBain **Motion**, Craig Bradshaw 2nd to accept the Atlanta minutes as distributed. The motion passed. (**9-0-0-3, CV**). Note: abstention due to not having attended Houston meeting.

Chair's Report (from TC/TG Section 8 Breakfast Meeting)

TAC update on TC Atlanta survey regarding formation of functional groups. They will not wholesale reduce committees from 100 to 30 as was suggested at the Atlanta meeting. Many good ideas were submitted and expect some to be rolled out in Austin. TC 8.1 is planning to approach TC 8.2 suggesting joint subcommittee meetings on programs, research and handbook and the respective chairs will reach out to their counterparts.

KC_TC Brkfst notes, Reminders & presenta

Liaison Reports

Section 8 Head Dustin Meredith, Kevin Mercer going forward. Dustin thanked members for attendance and we confirmed that quorum was achieved.

Rosters have not been released from headquarters yet. They are still targeting release by July 1 and asked how many new members had been added since Atlanta. Michael indicated he had received some but not sure of exact count without the roster having been published.

Discussed initiative to realign TC's into larger functional groups, see chairs report above.

ASHRAE Standards – James Douglas

Standard 23.1, Methods of Test for Performance Testing Positive Displacement Compressors that Operate at Subcritical Pressures of the Refrigerants. ASHRAE will publish Standard 23.1-2019 within a few months. Congratulations to Margaret Mathison, the chair of SPC 23.1-2010R, and her committee that extensively revised the 2010 version. This standard will be up for TC 8.01 periodic maintenance at the 2021 winter conference.

Standard 23.2, Methods of Test for Rating the Performance of Positive Displacement Compressors that Operate at Supercritical Pressures of the Refrigerants, has finished the First Public Review Process (April 26, 2019 to June 10, 2019). Scott McBain is the Chair of the revision committee. The publication public review is complete, and no comments were received. A PC letter ballot is in process proposing to recommendation for publication approval.

Standard 226P, Methods for Performance Testing Positive Displacement Refrigerant Compressors and Compressor Units, is the standard to be developed that combines elements of 23.1 and 23.2 into a single standard. Scott McBain is the Chair of the committee. The committee met informally in Kansas City to discuss plans and expects to be approved for Orlando. Anticipated meeting times are Monday 10:00 am-12:00 pm. ASHRAE MOS has agreed in principle to renumber the standard to 23 during the standards document development process so as not to induce significant non-value added work on industry.

Standard 41.4-2014R, Methods for Proportion of Lubricant in Liquid Refrigerant Measurement - Jim Douglas is the Chair of the committee. The present goal is to reach consensus on the first PPR draft at the 2021 summer conference.

Standard 41.9-2018, Standard Methods for Refrigerant Mass Flow Measurement Using Calorimeters - Michael Perevozchikov is the Chair of the committee. This standard was published in 2018 and will be due for periodic maintenance at the 2021 winter conference.

Standard 41.10-2013R, Standard Methods for Refrigerant Mass Flow Measurement Using Flowmeters - John Neel is the Chair of the committee. The present goal is to reach consensus on the first PPR draft at the 2020 winter conference.

AHRI Standards Activity – Matt Cambio for Justin Prosser

Standard AHRI 540-2019, Performance Rating of Positive Displacement Refrigerant Compressors. Expected publication date: Summer 2019. This standard combines the content of five (5) separate compressor standards (AHRI 510, 540, 545, 570, and 571) allowing a single rating standard for positive displacement compressors.

A YouTube Video is being developed on the topic of Compressor Performance Uncertainties with an expected publication date of Summer 2019. The Purpose is to communicate the content of a 2017 AHRI / ASERCOM white paper entitled "Tolerances and Uncertainties in Performance Data of Refrigerant Compressors".

Program/Research/Handbook

A joint s/c meeting held 6/23/19 → Attendees: Erik Anderson, Margaret Mathison, Mike Perevozchikov, Craig Bradshaw, Rick Heiden, Davide Ziviani, Steve Rudy, Scott MacBain. Meeting notes and plan as edited in the full committee meeting are shown below.

Program - Erik Anderson

Sponsored at KC

TC 8.01 co-sponsored 1 seminar

Seminar 19, "What's loss go to do with it" well attended thanks to Craig Bradshaw, Davide Ziviani, Kirill Ignatiev for presenting and Margaret Mathison for chairing the session.

Proposed for Orlando

1st Seminar: "Why Did I Take Thermodynamics" Chair: Alex Schmig (with help from Margaret), Speakers: – Craig Bradshaw, Davide Ziviani, Omer Sarfraz– Refrigeration System Modelling Compressor, heat exchanger, system. Intermediate type seminar.

- **Motion**: Craig Bradshaw – Motion / Eric Anderson 2nd.
- **Vote: 9-0-0-3 CV**

2nd Seminar: "Advancement in CO2 transcritical cycles": Scott and Michael will find people including Joe Sanchez. Bitzer, Carrier, Emerson, Purdue

- **Motion to cosponsor**: Craig Bradshaw – Motion / Eric Anderson 2nd.
- **Vote: 9-0-0-3-CV**

3rd Seminar: "Novel, HVAC&R Components" Craig Bradshaw, Davide Ziviani
- **Motion to cosponsor**: Eric Anderson – Motion / Eric 2nd.
- **Vote: 9-0-0-3-CV**

TC 10.7 asking TC 8.1 to co-sponsor Orlando seminar "State of the Art Refrigeration Technologies with Lower Environmental Impact". Georgi Kazachki is chairing the session(s) and has 8-9 speakers already and could take more. If interested to submit seminar, contact Georgi Kazachki with title, abstract and short bio.
- **Motion to cosponsor**: Craig Bradshaw – Motion / Eric Anderson 2nd.
- **Vote: 9-0-0-3-CV**

3.4 sponsoring a YEA delivered seminar on various handbook sections "YEA! Refrigeration Concepts for YEA Members" and asked if TC 8.1 would like to cosponsor. Andrew Brownell a newer member to TC 8.1 will participate with a presentation on compressor basics
- **Motion to cosponsor**: Craig Bradshaw – Motion / Jim Douglas 2nd.
- **Vote: 9-0-0-3-CV**

3.4 sponsoring a seminar titled "Lubricants and Lubrication: what's important for Low GWP refrigerants" and asked if TC 8.1 would like to cosponsor. Matt Cambio will solicit a speaker for this
- **Motion to cosponsor**: Craig Bradshaw – Motion / Eric Berg 2nd.
- **Vote: 9-0-0-3-CV**

Research Subcommittee – David Ziviani (Chair)

Update from Research Chair Breakfast
Chris Seeton is section 8.1 r/l; 13 WS proposals 5 accepted; 1 sent back with comments; $11.2M ongoing projects. $1.5M in new projects. The Houston chapter recognized for its outstanding research promotion; Strong equipment/fundamentals based leadership in place at RAC. A new research vehicle entitled Publication Topic Acceptance Request (PTAR) will be rolling out soon.

Update on WS 1793:
Title: "Development of method of test for motor component thermal conductivity"
Sponsorship: 8.2 (sponsor), 8.1 (co-sponsor), 1.11 (co-sponsor)
Lead Author: Rick Heiden
Note: was rejected in spring of 2018 but suggested to resubmit in 2019 timeframe. The new RL has asked to meet with Mark Adams and Rick Heiden after KC meeting before advancing or requesting any changes

Update on WS1830
Title: "Foamability properties of LGWP Refrigerant and Oil Mixtures"
Sponsorship: 3.4 (sponsor), 8.1 (co-sponsor)
Lead Author: Chris Seeton
Note: WS conditionally accepted with minor comments and will resubmit.

Future Proposals
1 – Effects of oil circulation ratio on direct refrigerant mass flow measurement devices – research in support of SSPC 41 supporting ASHRAE Std 23 – Davide will author and RTAR for consideration in Orlando.

2 – Map compressors by type with respect to capacity and efficiency tradeoffs as a function of refrigerant type. Output of research would enhance handbook chapters as an introduction to refrigerant change impacts and possibly a tool for ASHRAE. Work tasks would include running steady state thermodynamic simulations and building map of capacity and efficiency. Plug in volume curve, leakage path, tie with properties, blends, may include lubricants. Davide will mature proposal

Handbook – Scott MacBain

Chapter 38 "Compressors" (Section 1,2 and 3) has been submitted to Handbook Committee.
Chapter 43 "Liquid-Chilling Systems" (Section 1,2 and 4) has been submitted to Handbook Committee.

Scott MacBain – to take over as handbook subcommittee chair. Scott went to training session today. He is also incoming TC 8.2 Handbook s/c chair.
Good opportunity for others to be involved in the handbook.

Membership –Jim Douglas

We have 12 voting members at the time of this meeting. Doug Collings has resigned from the committee
If interested in becoming a voting member, send the chair a note.

Website – Doug Collings (Webmaster)

Eric Berg volunteered for this position as Doug has left.
ACTION ITEM: add approved Atlanta minutes to the website

Old Business – Michael Perevozchikov

None.

New Business - Michael Perevozchikov

Motion to Adjourn

Motion to adjourn by Jim Douglas Michael Perevozchikov adjourned meeting at 4:50p

Attachment 1 MEETING ATTENDANCE LIST AND CURRENT ROSTER

Sign In

TC8_1 Sign-in List 2019 0625 Kansas Ci

Roster

TC8.1_Roster_Kansas_City.pdf

Note: Double Click to open pdfs

TC 8.1 Attendance List – Kansas City

Name	Company		Status
Dr Michael Perevozchikov, PhD	Emerson	Michael.Perevozchikov@emerson.	Chair/VM
Dr Craig R Bradshaw	Oklahoma State University	craig.bradshaw@okstate.edu	Vice Chair /VM
Mr Rick M Heiden	Trane - Ingersoll Rand	rheiden@trane.com	Secretary/VM
Mr Erik S. Anderson	Anderson Engineering	eanderson@aenpi.com	Program/VM
Mr James L Douglas	Imagineering and MORE LL	jim.douglas.imagineering@gmail.c	Std/Memb./VM
Mr Eric Berg	Lennox Industries	eric.berg@lennoxind.com	VM
Mr Scott M MacBain, Sr	Carrier Corporation	scott.macbain@carrier.utc.com	VM
Mr John L Neel, PE	Johnson Controls Inc.	john.l.neel@jci.com	VM
Dr Christopher J Seeton	Shrieve Chemical Products	cseeton@shrieve.com	Research Liaison/V
Mr Matthew Cambio	Ingersoll Rand	mcambio@trane.com	CM
Mr Stefan Elbel	University of Illinois	stefanelbel@gmail.com	CM
Mr Dwayne L Johnson	Ingersoll Rand/Trane	sk0rp55dj@gmail.com	CM
Dr Georgi S Kazachki	Dayton Phoenix Group	kazachki@comcast.net	CM
Dr Margaret M Mathison, PhD		3mathison@gmail.com	CM
Dr Davide Ziviani PhD	Purdue University - Ray W.	dziviani@purdue.edu	Research/CM
Alex Schmig	Trane	Alex.Schmig@trane.com	PCM
Steve Rudy	Fandrich	steve@coneharvesters.com	PCM
Jessica Jude	CPI	Jessica.Jude@lubrizol.com	Guest
Andrew Brownell	Carrier	Andrew.Brownell@carrier.utc.com	Guest
Miguel Boscan	Bitzer US	Miguel.Boscan@bitzerus.com	Guest
Nathan Vogt	Exxon Mobil Chemical	Nathan.Vogtxxonmobil.com@e	Guest
Chase Yerger	University of Florida	Yerger@yfl.edu	Guest
Jethro Medina	The Chemours Company	Jethro.Medina@chemours.com	Guest
Seth Ycrborough	Oklahoma State University	Seth.Ycrborough@okstate.edu	Guest
Mazharul Islam	Oklahoma State University	Mazharul.Islam@okstate.edy	Guest
Mr Dustin Eric Jason Meredith,	Trane	dmeredith@trane.com	Section Head

Attachment 2: Code Of Ethics

ASHRAE Code of Ethics

(Approved by ASHRAE Board of Directors January 31, 2007)

As members of ASHRAE, we pledge to act with honesty, fairness, courtesy, competence, integrity and respect for others in our conduct.

Efforts of the Society, its members, and its bodies shall be directed at all times to enhancing the public health, safety and welfare.

Members and organized bodies of the Society shall be good stewards of the world's resources including energy, natural, human and financial resources

Our products and services shall be offered only in areas where our competence and expertise can satisfy the public need.

We shall act with care and competence in all activities, using and developing up to date knowledge and skills.

We shall avoid real or perceived conflicts of interest whenever possible, and disclose them to affected parties when they do exist.

The confidentiality of business affairs, proprietary information, intellectual property, procedures, and restricted Society discussions and materials shall be respected.

Each member is expected and encouraged to be committed to the code of ethics of his or her own professional or trade association in their nation and area of work.

Activities crossing national and cultural boundaries shall respect the ethical codes of the seat of the principal activity.