



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. TC 7.7 DATE February 19, 2017

TC/TG/MTG/TRG TITLE TESTING AND BALANCING

DATE OF MEETING January 30, 2017 LOCATION Caesar's Palace Romans Ballroom II

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Justin Garner	2015	David Bornside	2013	Tom Schlachter
Donald Prather	2015	James Hoctor	2013	Frank Spevak
Lloyd Le	2015			Mark Hegberg
Byron Hagan	2016			Gus Farris
Richard Rose	2016			Michael Langton
Tom Cappelin	2015			Gaylon Richardson
John Hamilton	2015			Michael Langton
				Ryan Fulmer
				Bryan Becker
				Jim Mayee

DISTRIBUTION: All Members of TC/TG/MTG/TRG plus the following:

TAC Section Head	Dr. Marija Todorovic	deresmt@eunet.rs
TAC Chair	Michael R Bilderbeck	mbilderbeck@pickeringfirm.com
ALI / PDC Liaison	James W Bochat	jim.bochat@cxconcepts.com
Chapter Tech Transfer Chair	Michael Cooper	mcooper@mccgroup.com
2019 HVAC Applications	Bryan Becker	beckerb@umkc.edu
Research Liaison	Christopher Wilkins, PE	chris.wilkins@crbusa.com
Standard Liaison	Rick Heiden	rheiden@trane.com
Manager of Standards	Stephanie Reiniche	sreinichie@ashrae.org
Staff Liaison	Mike Vaughn	MORTS@ashrae.net

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

MINUTES
TC 7.7 TESTING AND BALANCING
ANNUAL CONFERENCE
MONDAY – JANUARY 30, 2017 (2:15 – 4:15 pm)
CESARS PALACE CONVENTION CENTER ROMAN BALLROOM II
LAS VEGAS, NV

1. CALL TO ORDER

Chairman Garner asked all guests to provide contact information on one of the sign-in sheet that was being passed around.

A. Attendance: 7 of 9 voting members present – quorum is present

2. INTRODUCTIONS

Vice Chair Prather asked those attending to introduce themselves and identify the organization or company they represent.

3. APPROVE MINUTES FROM LAST MEETING

Minutes from the St Louis meeting were passed out. After a brief discussion, a motion to accept the minutes as amended was made by Mr. Rose and seconded by Mr. Hamilton. The motion passed 7-0-0

4. RECOGNIZE LIAISONS

Handbook Liaison Dr. Bryan Becker came to the meeting midway and addressed the committee. Our chapter goes to reprint in 2019 and is due in 2018. There was a discussion that there was an issue with our last revision submittal date and that we will be submitting these revisions with several other minor changes. Dr. Becker indicated he was unsure of the actual due date, he will advise us at a later time.

5. DISCUSS ISSUES FROM TC BREAKFAST

Chairman Garner briefly covered the information provided at the TC Chairman's breakfast. (See attached handout)

6. SUBCOMITTE REPORTS

A. Handbook - Mark Hegberg

No Report. There was no subcommittee meeting at this conference, Mr. Hegberg has a conflict Saturday's at noon. TC Chairman Garner requested Mr. Hegberg to select a new time for handbook meeting. After further discussions throughout the meeting, Chairman Garner requested Mr. Hegberg to coordinate with program & research chairs and select a new common meeting time.

B. Program - Tom Schlachter (See attached Program Handout)

There was no subcommittee meeting at this conference. Mr. Schlachter was representing TC7.7 @ RP-1741 - Understanding fan coil components and how they relate to energy consumption and energy modeling.

Mr. Farris indicated that this RP is very similar to the RP for FPVAV's that led to RP's on EMC motors. These RP's led to many papers, seminars and awards, which reflected positively on TC 7.7.

Our proposed seminar with TC 9.10 regarding Blade & Venturi terminals was rejected for the conference here in Las Vegas. Mr. Richardson reported that this seminar will be reorganized and an application will be made for the next conference in Long Beach. Chairman Garner indicated proposals for the Long Beach seminars are due February 6, 2017.

Mr. Farris indicated he had submitted a proposal for a seminar on Chilled Beams and Fan Assisted Chilled Beams for Las Vegas and it was rejected, he will refile for Long Beach.

Mr. Hegberg indicated he will be submitting a rebuttal to the hydronic flow control panel discussion that was presented here in Las Vegas.

Mr. Schlachter indicated that a list of proposed seminars for Las Vegas was not submitted to the program chair or TC Chair for review for sponsorship opportunities. Chairman Garner indicated that he followed up on this at the TC Chairs breakfast and was assured this was an oversight. Note: there were two (2) programs that were presented in Las Vegas that TC 7.7 would have co-sponsored.

C. Membership – Donald Prather

The following members rolled off as voting members: Mr. Spevak and Farris. The following are new voting members: Mr. Hagan & Rose. With Garner, Prather, Capelin, Bornside, Hamilton, Hoctor & Le the remaining voting members.

Mr. Hoctor and Bornside will be rolling off as a voting member's; Mr. Prather will be reaching out for new voting members.

D. Research - Frank Spevak

Mr. Spevak reported the following information on ASHRAE Research:

- Joseph Huber received the Service to ASHRAE Research Award.
- Larry Markel, former RAC Chair made a public service announcement that all committees of ASHRAE need more and new members. If you are interested, talk to a committee chair or nominate yourself. Committee chairs are encouraged to note potential members for committees when in various meetings.
- RAC received and accepted 3 RTARs. There were 4 Work Statements (WS) considered with 1 conditionally accepted and 3 returned.
- Innovative Research Grants - there were 33 pre-proposals received and 6 are qualified for full proposals. Idea of these grants are to fund research in projects that are truly innovative not as a way for TCs to get projects through research. This is the most proposals received since this has been created.
- New Investigator Award had 16 nominations and 1 was selected and that individual will be contacted.
- Co-sponsoring TCs should be providing input to RTAR and WS development. Full TC voting information is needed from both sponsoring and co-sponsoring TCs.

- A lot of emphasis was placed on Project Monitoring Subcommittee (PMS) training and work. A webinar will be announced soon. More information on Milestone and Task Monitoring will be announced. Some projects in WS stage have been returned as the milestones were not clear. Appropriate and timely actions need to be taken on a project for delayed or non-complete milestones

Mr. Hagan reported the following information on RP-1741:

- Project awarded to LSU – Lafayette
- This research tests fan & coil performance
- Preliminary OEM report is being produced and is expected soon
- Project timeline is 24 months

E. Journal - Justin Garner

Committee is seeking a volunteer to serves as TC 7.7 liaison.

F. Standards

STD 111 - Gaylon Richardson

Committee will be meeting tomorrow morning @ 8:00 am in the Campania Room. The revisions are near completion and will be completed and sent out for review in Long Beach.

GPC 11 - Tom Schlachter

Progress continues to be made updating the guideline. The committee met on Saturday 1/25/2017 and has held monthly teleconferences. Tentative completion of First Draft is slated for next summer's Conference in Long Beach.

G. Education – Justin Garner

Committee is seeking a volunteer to fill this position.

H. Web Master – Aldin Andrade

Current sub-chair Mr. Andrade could not be in attendance, Chairman Garner reported the web-site is up to date.

7. LIASON REPORTS FROM OTHER TC'S OR ORGANIZATIONS

TC 1.2 Instruments & Measurements - Frank Spevak

Guideline 2 - Uncertainty Analysis will not meet code language. Will be voting to reaffirm Adhoc committee to provide examples

TC 1.4 Control Theory & Application - David Bornside; Liaison not present

Mr. Hegberg reported TC 1.4 working on research proposal regarding control valves; however nothing has been put in writing yet.

TC 5.2 Duct Design – Gus Farris

- Progressing with design guide
- Super TC formation has not materialized

TC 5.3 Room Air Distribution - Byron Hagan & Gus Farr Byron Hagan

- See above noted on RP-1741
- VAV design guide is being turned in for review

TC 5.6 Control of Fire & Smoke - Gerald Kettler

- Not present (recent back surgery), no report.

TC 6.1 Hydronic & Steam Heating Equipment & Systems - Don Prather

- Meets Tuesday @ 1:00pm, no other report

TC 7.9 Building Commissioning - Gerald Kettler

- Not present, no report

TC 9.10 Laboratory Systems - Lloyd Lee

- Meets Tuesday @ 3:30pm
- Will be proposing a seminar for Long Beach, regarding Lab Commissioning

AABC – Gaylon Richards

- Updated training manual should be released in May.

NEBB – Richard Rose

- NEBB working on ANSI CX standard

SMACNA – Eli Howard;

- Not present, no other report

ACCA – Don Prather

- Nothing to report

ICB / TABB – John Hamilton

- Moving forward with ICRA, presently have 5 ANSI accredited programs.

ASHRAE Code Interaction Sub-Committee (CIS) – John Hamilton

- Meets tonight 5:15 to 6:15 in Forum Room 6

SPC-2.02 – Justin Garner

- Recently reorganized
- All associated standards and guidelines will have continuous maintenance
- Richard Rose reported ASHARE is moving forward with Cx certifications using DOE guidelines

8. OLD BUSINESS

- Chairman Garner to follow-up with Mr. Richardson with the answer to Technical FAQ #300.

9. NEW BUSINESS - None

10. ADJOURN

Motion to adjourn was made @ 4:00pm by Mr. Rose, second by Mr. Hamilton and accepted by committee consensus.

NEXT MEETING:

Long Beach, CA

Monday June 26, 2017 2:15 – 4:15 pm

Long Beach – summer 2017

Submission Dates and Track Information

This is the overall publication schedule for the 2017 ASHRAE Annual Conference, Long Beach. For specific details and questions regarding these dates, please contact the appropriate Track Chair.

August 29, 2016 Conference Paper Abstracts and Technical Papers Due
September 9, 2016 Conference Paper Abstract Notifications Due
December 9, 2016 Final Conference Papers Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment)
January 2, 2017 Website Opens for Seminar, Forum and Workshop Proposals
January 16, 2017 Conference Paper Accept/Revise/Reject Notifications Due
February 6, 2017 Seminar, Forum and Workshop Proposals Due
February 10, 2017 Revised Conference Papers/Final Technical Papers Due
February 20, 2017 Conference and Technical Paper Final Accept/Reject Notifications

Track 1: Fundamentals and Applications Track Chair: [Frank Schambach](#) Email: frankschambach@mindspring.com
It's back to the basics! This track provides the foundation for design and construction of HVAC&R components and their application. This track seeks papers and programs of varying levels to provide discussion on theories, models, designs and shared experiences. Topics may range from fan laws and psychometrics to room air distribution and heat transfer and much more.

Track 2: HVAC&R Systems and Equipment Track Chair: [Jennifer E. Leach](#) Email: pennst8jen@yahoo.com
What system and equipment are best for my building? Selection of equipment and design of systems is critical for effective HVAC&R operation and usually has more than one right answer. This track will provide engineers, designers, contractors, owners and building operators the tools to properly design, select and operate traditional, non-traditional and hybrid equipment and systems. The papers and programs within this track may range from basic concept to the technical analysis of system performance.

Track 3: Refrigeration Track Chair: [Vikrant Aute](#) Email: vikrant@umd.edu
The refrigeration cycle is a key component to our daily needs, as it is used for thermal comfort, food storage, creating ice and medicinal needs. There have been numerous improvements and changes to refrigeration systems and refrigerants to accommodate the increased system efficiency. This track seeks papers and programs that address the wide range of applications of refrigerants and their improvements, including variable refrigerant flow applications, refrigerant management and food storage.

Track 4: Building Life Safety Systems Track Chair: [Robert Alan Neely](#) Email: alan_neely@pghcorning.com
Building life safety systems are critical in commercial facilities to protect building occupants from fires and power outages. This track focuses on building egress, fire protection systems, fire alarms, emergency lighting, fire and smoke barriers, and special hazard protection and describes key factors to consider when designing these life safety systems. Papers and programs are sought to evaluate design strategies for the life safety systems noted above along with building specific life safety systems, such as gas detection systems, kitchen ventilation and smoke evacuation systems, etc.

Track 5: Controls: Smart Building Systems and the Security Concerns as Technology Emerges Track Chair: [Melanie Derby](#) Email: derbym@ksu.edu
This track will explore smart building systems and how they can be incorporated into commercial facilities to help reduce energy consumption and improve occupant comfort. As these technologies advance and buildings become "smarter," the questions is asked ... "Is my building in threat of a cyber-attack?" As owners and designers incorporate more controls system with web and cloud access into buildings, there is a concern that this allows more opportunities for hackers to gain access into sensitive and confidential databases. The programs within this track will explore measures to keep this information safe, while maintaining the flexibility of remote control/access of building systems.

Track 6: Commissioning: Optimizing New and Existing Buildings and their Operation Track Chair: [Dennis Alejandro](#) Email: denzjac@yahoo.com
High efficiency building systems come at a cost, and after the owner's initial investment it is important to verify that the system components are operating as the designer intended. Secondly, the systems need to be operated properly to reach and maintain the system efficiency levels. This track seeks papers and programs providing lessons learned and recommendations for successful commissioning projects. This track also seeks case studies of existing buildings with a retro-commissioning plan to reduce energy consumption and evaluate the payback of these modifications.

Track 7: Net Zero Energy Buildings: The International Race to 2030 Track Chair: [Jason DeGraw](#) Email: jason.degraw@nrel.gov
Title 24 and Architecture 2030 have ambitious goals for all commercial buildings in California to be Net Zero Energy (NZE) by the year 2030. This track will assist the design team and owners to evaluate various systems (including HVAC, building envelope, lighting, domestic water and renewable energy system), design strategies, construction measures and building operation to achieve NZE. The programs within the track will also explore the advancing code and regulations that countries around the world are implementing to reduce building energy consumption.

Track 8: Residential Buildings: Standards Guidelines and Codes Track Chair: [Kimberly Pierson](#) Email: kdpwildcat@gmail.com
ASHRAE is known for its standards and design guidelines and their evolution to improving the built environment and its systems. This track will inform designers, contractors and owners of the current requirements and upcoming changes to ASHRAE's low-rise residential guidelines: Standard 90.2, Standard 62.2 and Guideline 24. This track also seeks papers and programs for cutting-edge residential systems and the incorporation of ASHRAE standards in the design.

Track 9: Research Summit Chair: [Ann Peratt](#) Email: ann.peratt@gmail.com
The fifth annual Research Summit brings together distinguished researchers to present the latest research results. Papers are requested on the following topics: 1) building science research that addresses the performance of buildings systems and occupant usage and 2) renewable energy research and its impact as we move towards net zero energy buildings.

Conference Program Chair: [Ann Peratt](#) Email: ann.peratt@gmail.com

Staff Support For information on the technical program, special events, special sessions and general conference inquiries
[Tiffany D. Cox](#) Assistant Manager of Conference Programs Email: tc Cox@ashrae.org

Chicago – Winter 2018

Submission Dates and Track Information

This is the overall publication schedule for the ASHRAE 2018 Winter Conference, Chicago. For specific details and questions regarding these dates, please contact the appropriate Track Chair.

Wednesday, March 01, 2017	Conference Paper Abstracts, Technical Papers and Paper Session Requests Due
Monday, March 27, 2017	Conference Paper Abstract Accept/Reject Notifications
Friday, June 02, 2017	Website Opens for Seminar, Forum, Debate, Panel and Workshop Proposals
Friday, July 07, 2017	Final Conference Papers Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment); Request for Conference Paper Sessions Due
Monday, July 24, 2017	Conference Paper accept/reject notifications
Tuesday, August 01, 2017	Seminar, Forum, Workshop and Paper Proposals Due
Monday, August 07, 2017	Revised Conference Papers/Final Technical Papers Due
Monday, August 21, 2017	Conference and Technical Paper Final Accept/Reject Notifications
Wednesday, September 06, 2017	Seminar, Forum, Workshop Accept/Reject Notifications
Friday, December 01, 2017	Upload of PPTs Begin
Monday, January 08, 2018	All PPTs Due Online
Wednesday, January 17, 2018	Final Day for Commercialism Revision Upload prior to on-site
Saturday, January 20, 2018	Speaker's Lounge Opens

Track 1: Systems and Equipment Track Chair: Carrie Anne Crawford Email: carriecrawford@eeace.com

Selection of equipment and systems is paramount to HVAC&R design. Papers and programs in this track will assist designers, engineers, and operators in the design, selection, and operation of HVAC&R systems and equipment.

Track 2: Fundamentals and Applications Track Chair: Kevin Marple Email: kmarple@benzco.com

Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychometrics, fluid and mass flow, IAQ, and building envelope. This track provides opportunities for papers and presentations of varying levels across a large topic base. Concepts, design elements and shared experiences for theoretical and applied concepts of HVAC&R design are included.

Track 3: Standards, Guidelines and Codes Track Chair: Corey Metzger Email: corey.metzger@resourcece.com

ASHRAE is known for its standards and design guidelines – and they are constantly evolving with the intent on improving the built environment and its systems. Designers, Contractors, Architects and Owners must be able to keep up with the continuing changes in the current cycle but to also be prepared for the future changes. In addition, there is a large interaction of ASHRAE with the code authorities and government to incorporate these standards and guidelines. The series of sessions in this track highlight the changes to the standards and guidelines, their projected path and optimum design techniques to meet or exceed the standards.

Track 4: Earth, Wind & Fire Track Chair: Ashish Rakheja Email: ashish.rakheja@aeonconsultants.in

Designing for natural elements and other possible disasters often requires specific elements of building design and construction. From materials to stabilizing elements and simulations to specifications, these options must be incorporated. This track will deliver on modern strategies to address all of these conditions. Be prepared to be blown away by industry practices to prevent disastrous results.

Track 5: Transportation IAQ and Air Conditioning Track Chair: Dimitris Charalambopoulos Email: dimitris@ashrae.gr

Often considered boutique engineering, both enclosed vehicular facilities and transportation design, construction, operation, and maintenance needs to be elevated to equal status with other HVAC applications. These systems require the same design approach as other system designed but usually have special technical requirements that mandate close velocity capture/control, air quality control, etc. that can be overlooked but the more traditional building system design engineer. This track will seek case studies and trouble-shooting projects highlighting the opportunities and pitfalls associated with these unique applications.

Track 6: Tall Buildings Track Chair: Leticia Neves Email: leneves@gmail.com

Chicago is home to one of the tallest buildings in the world. One that stood the tallest in the world for nearly 25 years. However, today, more and taller buildings are being designed and constructed. This track will draw upon "larger than life" case studies, as well as large building HVAC systems that can be classified as "innovative and/or 21st century" that highlight the opportunities presented and achieved by the designer, builder, and operator for facility HVAC systems throughout the world.

Track 7: Modeling Throughout the Building Life Cycle Track Chair: Joseph Farrantello Email: jfarrantello@gmail.com

Modeling was originally concerned primarily with building and system design specifications. The demands of energy efficient operation brought about the need for modeling of part-load operation for a variety of off-design conditions. The explosion of computational capacity and data collection capability is rapidly expanding the scope, complexity and practical applications of modeling both during design, but even more so for fault detection, diagnostics and operational optimization. Thirty years ago, people were dreaming of doing some of the things that Building Information Modeling is now bringing to reality. Presentations and papers are solicited related to all aspects of building modeling, with a particular interest in successful applications that have extended modeling into operational phases of the building life cycle.

Track 8: Heat Exchange Equipment Track Chair: Vikrant Aute Email: vikrant@umd.edu

Given the critical importance of energy efficiencies and reliability of HVAC systems, new heat and mass transfer HVAC & R equipment and advanced systems have been developed. Bringing non-traditional technologies to the actual field is not trivial task and how to design the equipment and characterize the performance of new HVAC &R technologies under real field type conditions are still open questions. The papers and programs in this track will inform designers, engineers, building energy simulation modelers, and energy consultants and practitioners in the use of non-traditional heat exchange equipment and advanced HVAC &R systems under real field type conditions. The track will focus on fundamentals and applied aspects, on current challenges and recent advancements for managing frost growth, water condensate, fouling, corrosion, and mitigation of mold growth and bacteria that are often encountered in heat exchange equipment when working under real field type conditions.

Track 9: Refrigerant Mini Track @ Expo* Track Chair: Gary C. Debes Email: gcdebes@verizon.net

*Section will determine topics, speakers, session types, etc.

Conference Program Chair: Michael Collarin Email: Michael.Collarin@parsons.com

Staff Support

For information on the technical program, special events, special sessions and general conference inquiries

Tiffany D. Cox Assistant Manager of Conference Programs Email: tcox@ashrae.org

Technical Support

For technical problems or for help in submitting an abstract online, [email Tech Support](#)