1791 Tullie Circle, N.E./Atlanta, GA 30329
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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 2.6 DATE August 4, 2017

TC/TG/MTG/TRG TITLE Sound and Vibration Control

DATE OF MEETING June 26, 2017 LOCATION Long Beach, California

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Voting members:		**Voting members:**		**Guests:**
Hassler, Robert		Bridger, Joseph		Besseling, Aaron
Hooti, Matthew		Murello, Matthew		Brooks, Joe
LaForgia, Dan		Papadimos, Chris		Campbell, Scott
Marks, Patrick				Campbell-Kyvreghyan, Naira
Meeuwsen, Greg		**Corresponding members:**		Fullerton, Brent
Prime, Raj		Alkhalil, Rami		Mathson, Tim
Swan, Jason		Babich, Jeffrey		Minear, Zach
		Bastasch, Mark		Rochester, Julian
Corresponding members:		Berardi, Umberto		Shipp, Paul
Boldt, Jeffrey		Blum, Nathan		Stegall, Jack
Carroll, David		Broner, Norman		Waters, Angela
Desai, Ashish		Busch, Todd		Moore, Andrew
Eichelberger, Curt		Bushnell, Peter		Clark, Matt
Kline, Jim		Chinoda, Zvirimumwoyo		Yushau, Tom
Meisel, Paul		Clemente, Victor		Marshall, Jonathan
Miller-Klein, Erik		Copley, Lawrence		Sethi, Ankil
Mitchell, Andrew		Cuff, Nicole		
Osborn, Kim		Deveci, Martin		
Schwob, Michael		Dunlap, John		
Simmons, Robert		Eaton, Erroll		
Wowk, Roman		Eligator, Ronald		
		Fly, Mark		
Provisional corresponding members:		Froehlich, Michael		
Aquilina, David		Gaghan, Kevin		
Bulookbashi, Ladan		Ganesh, Radha		
Caldwell, Trevor		George, Jason		
		Goodfriend, Lewis		

Provisional corresponding members (continued): Callaway, Deborah Deibler, Nate Long, Mark Mathson, Timothy Saenz-Acosta, Karina Schmeida, Michael		**Corresponding members (continued):** Guenther, Brian Guney, Ali Kemal Hallstrom, Arthur Herfat, Ali Horesco, Joseph Keating, Michael Keith, Reginald Khati, Manoj Kloostra, Marvin Kowald, Will Lai, Kevin Lau, Eddie Lilkendey, Robert Lilly, Jerry Maruthuria, Parag Mattocks, Charles Meredith, Dustin Michaud, Alexander Miller, Gregory Mohamed, Ahmed Muehleisen, Ralph Nepomuceno, Jose Pappas, John Peppin, Richard Peterman, Karl Pooler, James Resetar, Michael Reynolds, Brian Reynolds, Douglas Rockwood, William Ronsse, Lauren Roy, Kenneth Ryherd, Erica Sachwald, Benjamin Sardar, Asad Schaffer, Mark Shook, Ken Simcoe, Tim Sofra, John Spencer, Michael Stewart, William Sturm, Eric Sylvestre-Williams, Nicholas Tyson, Terence		

		Corresponding members (continued): Wang, Jack Wang, Lily Wang, Zhiping Warick, Don Weinstein, Jonathan Wise, Steve Zimmerman, Randal Zybura, Jack **Provisional corresponding members:** Bredesen, Thomas Cape, Timothy Choi, Wongyu Ellison, Ryan Hawkins, Russell Joshi, Garvit Latshaw, Bryan Lord, David Mahmoud, Mahmoud Mezache, Macinissa Miller, Jane Sever, Okan Shafer, Benjamin Shipp, Paul Singh, Ravindra Stauter, Rich Stockmans, Jeremy Tripathi, Ashish Wang, John Wentz, Philip Woods, Kenny		

DISTRIBUTION: ***All Members of TC/TG/MTG/TRG plus the following:***	
TAC Section Head:	Bert Phillips
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)	Pawel Wargocki Cyrus Nasseri Michael Vaughn
Mike Vaughn, Manager Of Research & Technical Services	MORTS@ashrae.net

Main Committee Meeting Agenda
2:15-4:15 PM Monday, June 26th 2017
LBCC Room 202C– Long Beach CA
NOTE: All Task Group Chairs and Subcommittee Chairs are asked to submit written report to the Secretary (Andrew Mitchell) before Friday July 14th 2017

1. **Call to order** (LaForgia) [3 minutes]
   - 1.1. Read scope of TC 2.6
   - 1.2. ASHRAE Code of Ethics statement: "The ASHRAE Code of Ethics is to be adhered to by those doing ASHRAE business whether or not they are an ASHRAE member (www.ashrae.org/about-code-of-ethics)."
   - 1.3. Additions and/or modifications to the agenda
2. **Introduction of those present** (LaForgia) [5 minutes]
   - 2.1. Welcome new members and visitors
3. **Confirmation of current voting members** (Schwob/Mitchell) [3 minutes]
4. **Review and approval of the minutes** (Mitchell) [3 minutes]
   - 4.1. **Jason Swan (1st), Patrick Marks (2nd), 7-0-0-3-CV**
5. **Secretary's report** (Mitchell) [3 minutes]
   - 5.1. All Task Group Chairs and Subcommittee Chairs are asked to submit written report to the Secretary (Andrew Mitchell) before Friday July 14th 2017
6. **TC Chair's meeting report** (LaForgia) [5 minutes]
7. **Chair's announcements and correspondence** (LaForgia) [3 minutes]
8. **Standard for Design of High-Performance Green Buildings (189.1)**
   - 8.1. There will be a vote taking place on Wednesday (6/28) for 189.1.
   - 8.2. TC 2.6 vote for support on the 189.1 standard, Supporting Addendum for Acoustical Control in 189.1 Standard for the Design of High-Performance Green Buildings.
     - 8.2.1. **Voting members: Patrick Marks (1st), Jason Swan (2nd), 7-0-0-3-CV**
     - 8.2.2. Voting of Corresponding members and Guests: 21-0-5
9. **Subcommittee reports (written reports to be provided to Secretary)**
   - 9.1. **Research Subcommittee** (Meeuwsen) [20 minutes]
     - 9.1.1. Research Chair's meeting report
     - 9.1.2. Ongoing research projects
       - 9.1.2.1. RP-1408 The effect of lining length on the insertion loss of acoustical duct liner with PI Reynolds/UNLV (Lilly) – Final drafts submitted
         - 9.1.2.1.1. Expect to have a vote within the next 2 weeks for the 3rd draft of the final report; work will then be completed on integration of information into the applications handbook.
     - 9.1.3. Work Statements/RTAR's/URP's
       - 9.1.3.1. RTAR-1707 Annoyance Threshold of Tones in Noise as related to building services equipment (J. Swan) – Update from RAC fall 2017
         - 9.1.3.1.1. Jason Swan indicated that TC 2.1 voted in 2015 (which isn't the most current version). Curt Eichelberger indicated he would request another vote within TC 2.1 on 6/27.
       - 9.1.3.2. RTAR- 1754 Developing the standard test method for Dynamic Characteristic of Vibration Isolators (G. Meeuwsen) – vote tomorrow if possible
         - 9.1.3.2.1. Expect to address issues and have a vote on the RTAR by the end of July (2017).

9.1.3.3. RTAR xxxx Speech privacy in high performance buildings (Miller-Klein) – liaisons from other committees must be present

9.1.3.3.1. Technical committees already voted on RTAR (TC 4.4, TC 9.6); TC 2.1 will vote 6/27.

9.1.3.3.2. **Motion to approve RTAR, Patrick Marks (1st), Greg Meeuwsen (2nd), 7-0-0-3-CV**

9.1.3.4. RTAR xxxx Inlet and Outlet System Effects on Multiple Plenum Fans in a Parallel Arrangement (Fan Arrays) for Air and Sound Performance Co-Sponsor with TC 5.1 (K. Osborn)

9.1.3.4.1. Kim Osborne indicated that the RTAR was approved with comments; will begin on the work statement (WS) after the comments are received.

9.1.3.5. RTAR xxxx Procedure for estimating occupied space sound levels in the application of UFAD air terminals and air outlets.

9.1.3.5.1. RTAR still in development by Randy Zimmerman in TC 5.3.

9.1.4. Topics for future research

9.2. **Programs Subcommittee** (Miller-Klein) [15 minutes]

9.2.1. Program Chair's meeting report

9.2.2. Programs this meeting

9.2.2.1. Hot topics this meeting

9.2.3. Potential programs next meeting – Chicago IL 2018

9.3. **Publications Subcommittee** (Wise) [10 minutes]

9.3.1. Handbook chapters

9.3.1.1. Handbook Applications 2019 (Wise)

9.3.1.1.1. Expanding outdoor noise section, vibration isolation section (transformers and fan arrays).

9.3.1.2. Handbook Fundamentals 2017 (Wise)

9.3.2. Other publications

9.3.2.1. Practical Guide to Sound & Vibration Control

9.3.2.2. Application of Manufacturers' Sound Data

9.3.3. Web page (Schwob)

9.4. **Standards Subcommittee** (Bridger) [20 minutes]

9.4.1. SPC 130 – Method of Test for Rating Ducted Air Terminal Units (Zimmerman)

9.4.2. SPC 189.1 – Design for High Performance Green Buildings (Miller-Klein)

9.4.2.1. Refer to section 8 above.

9.4.3. SPC 200 – Method of Test for Chilled Beams (Zimmerman)

9.4.4. Updates from Other Standards Organizations

9.4.4.1. AHRI (Abbate)

9.4.4.1.1. Started work on 4 new standards: AHRI 275, 885, 530 and 370.

9.4.4.1.2. Working on 375, Application of Sound Rating Levels of Large Air-cooled Outdoor Refrigerating and Air-conditioning Equipment.

9.4.4.1.3. All meetings are open and can be attended by guests.

9.4.4.2. AMCA (Brooks)

9.4.4.2.1. Completed sound seminar from 6/19 to 6/21 (this is held every 2 to 3 years).

9.4.4.2.2. Working on fan energy index, an efficiency metric for regulation (ASHRAE 90.1 asking for recommendations from TC 5.1).

9.4.4.3. ANSI (Ali Herfat)

9.4.4.3.1. Working group is working to add section on gymnasiums to S12.60 (meeting on 6/27).

9.4.4.4. ASTM (Peppin); E33 (Lilly)

9.4.4.4.1. Round robin results for E477-13 (silencers) is being reviewed. Initial results look like there was good consistency between laboratories.

9.4.4.4.2. Round robin for E336 was recently completed (testing has been completed and data is being compiled). Also, E336 is removing Field Sound Transmission Class (FSTC) in favor of Apparent Sound Transmission Class (ASTC).

9.4.4.4.3. Working on consolidation of speech privacy metrics.

9.4.4.4.4. Discussion of modifying impact insulation class to better account for lower frequencies; looking at higher frequency components for evaluating efficiency of resilient underlayment.

9.4.4.4.5. Working on compiling door testing transmission loss data.

9.4.4.5. ISO (Reynolds); ISO TC205/TC43.2 (Roy)

9.4.4.5.1. TC43.2 (Swan); Working Group 29 will be discussing acoustic classification of buildings 6/29, which gives classifications on a grade type scale (A thru F).

9.4.4.5.2. Active working groups on measuring flanking noise, sound insulation of buildings; there is a big push to extend test methods to include lower frequencies and adding ISO test methods for bang machines, rubber balls, which are more commonly being used in Asia where there are more timber structures.

9.4.4.5.3. Working Group 27 is falling away (acoustic scope of services for environmental subjects).

9.4.4.5.4. Work in progress with measuring absorption in reverberation rooms (using a reference absorber).

9.4.4.5.5. Work in progress with measuring of office screen sound attenuation (partial height barriers in office spaces).

9.4.4.6. Gypsum Association (Schmeida)

9.4.4.6.1. The GA updated the TC on two initiatives:

9.4.4.6.1.1. The GA is updating their GA-600 Fire-Resistance and Sound Control Design Manual to include sound test data and curves (STC) for all generic assemblies (as opposed to proprietary assemblies added by a specific gypsum board manufacturer). They will also be deleting STC values for systems with an STC under 40 for these generic systems. This may take 1-2 editions, the first one coming out December 2018.

9.4.4.6.2. The GA is drafting 5 proposals for the 2021 ICC Code Cycle dealing with acoustics:

9.4.4.6.2.1. In the IRC, they are seeking to make the current Appendix K (non-mandatory) mandatory by

migrating the language to IRC Chapters 5 and 6, as appropriate.

9.4.4.6.2.2. As a back-up to the above, the GA is drafting a proposal to include site testing as an option in the current appendix.

9.4.4.6.2.3. In the IBC, the GA is drafting a proposal to address flanking, which is not currently discussed in the code.

9.4.4.6.2.4. The GA is drafting a proposal to clarify inaccuracies in referenced test methods/standards to clarify the code.

9.4.4.6.2.5. The GA is debating a proposal to increase performance criteria in the OBC to meet the ICC-G2 guide.

9.4.4.6.3. It should be noted moving forward the GA is likely going to make additional changes based on the ICC-G2 guidance. Anyone wishing to work with the GA on code proposals is encouraged to contact Michael Schmeida at mschmeida@gypsum.org.

9.5. **Standing Subcommittees** [10 minutes]

9.5.1. Vibration Isolation (M Hooti)

9.6. **Operations Subcommittee** (LaForgia) [15 minutes]

9.6.1. Honors and awards (Miller-Klein)

9.6.2. Long range planning (LaForgia)

9.6.3. Membership (Schwob/LaForgia)

9.6.4. Liaisons (Miller-Klein)

9.6.4.1. ASHRAE TC 2.1 Physiology and Human Environment (K. Roy)

9.6.4.1.1. Co-sponsoring two (2) research projects and will be requesting votes for 6/27.

9.6.4.2. ASHRAE TC 2.7 Seismic and Wind Resistant Design (Peterman)

9.6.4.2.1. Meeting 6/27; pursuing programs in the Earth Wind and Fire track and will be looking for co-sponsorship with TC 2.6.

9.6.4.3. ASHRAE TC 5.1 Fan Design and Application (Osborn)

9.6.4.3.1. Work Statement for fans in parallel arrangement (refer to 9.1.3.4).

9.6.4.4. ASHRAE TC 5.2 Duct Design (Hassler)

9.6.4.4.1. Duct Design Guide

9.6.4.4.1.1. Working on static regain versus equal friction in manual.

9.6.4.4.2. Duct fitting database

9.6.4.4.2.1. Adding converging and diverging fittings in the duct fitting database.

9.6.4.5. ASHRAE TC 5.3 Room Air Distribution (Zimmerman)

9.6.4.5.1. AHRI 880/885 Air Terminals

9.6.4.5.2. AHRI 1240 Performance Rating of Chilled Beams

9.6.4.5.2.1. New addition published in 2017.

9.6.4.6. ASA (L. Wang)

9.6.4.7. VISCMA (Peterman)

9.6.4.7.1. Working to get name out and become more relevant in the industry (i.e. generating papers, email distributions once

per month, expanding on LinkedIn with notifications to subscribers, etc.). Also, reviewing web content FAQ to make them more relevant (moving away from Q/A format to more succinct answers). Looking to add in search functionality to search content form a design standpoint, equipment standpoint, etc.

9.6.4.8. Others: CTI (Miller-Klein), INCE (Lilly), NCAC (Bridger), CIBSE (Swan), EGSA (Simmons), etc...

9.6.4.8.1. CTI – integrating field testing and certifications on cooling towers. Erik Miller-Klein is participating to help improve the documents.

9.6.4.8.2. NCAC – next meeting December 2, New Orleans, LA.

9.6.4.8.3. EGSA – recommended practice of silencer ratings for generators can be downloaded for free at egsa.org.

10. New business/Old business [5 minutes]

10.1. **Changes to TC 2.6 positions**

10.1.1. Dan rolling off as chair; Vote for Erik Miller-Klein as new chair of TC 2.6:

10.1.1.1. **Dan LaForgia (1st), Patrick Marks (2nd), 7-0-0-3-CV**

10.1.2. Andrew Mitchell is rolling off as Secretary; Roman Wowk will become Vice Chair, Karina Saenz-Acosta will become Secretary.

11. Next meeting date and location – AHR Expo Chicago IL 2018

12. Adjournment

ASHRAE TC2.6 Research Subcommittee Report, 06/26/2017, Long Beach, CA.
Greg Meeuwsen

Attendees:

Approximately 20 people.

Highlights of Research Chair's meeting:

- Our research liaison is Pawel Wargocki (RL2@ashrae.net). Our Research Liaison (RL), should review all RTARs and WSs before submittal to RAC. Please copy Greg Meeuwsen, TC Research Chair (gmeeuwsen@trane.com) on all correspondence with the Research Liaison.
- 7 RTARs considered by RAC, 1 accepted, 3 accepted with comments, 3 rejected.
- 11 work statements considered by RAC, 1 accepted, 7 conditionally accepted, 3 returned.
- Will begin enforcing milestone monitoring, PMS must report on milestones, no payment if milestone not met, timely actions taken.
- WS is going back to MS Word document, but there will still be length limits for each section.
- PMS chair training module coming soon, it is ready, there will be a web meeting as well.
- RTAR and WS due dates for submission to RAC are May 15, August 15, and December 15.

Ongoing Research Projects:

RP-1408 The effect of lining length on the insertion loss of acoustical duct liner. Jerry Lilly PMS chair. Dr. Doug Reynolds, UNLV, principle investigator. The objective of this research is to determine how the sound attenuation of lined ducts depends on duct length. Third draft of report received, only minor things to clean up, Jerry expects to complete a PMS committee vote in next two weeks.

RP-1529 Full frequency numerical modeling of sound transmission in and radiation from lined ducts –The project is complete and a final report is on the web site. Follow on work is needed to fill in gaps in the handbook. This can be done by submitting a WS under the same RP number. On hold until results of RP1408 are drafted for handbook.

Work Statements/RTARs:

RTAR-1754 - Developing the standard test method for dynamic characteristics of vibration isolators. RTAR is approved by RAC. WS was circulated to voting members and RAC liaison, there are some concerns, so we will try to address and ballot by end of July.

WS-1707 Annoyance thresholds of tones in noise as related to building services equipment. Jason Swan updated the WS, got approval ballot from TC2.6, approval (sort of) from TC2.1, submitted to ASHRAE staff. They misplaced it, and it did not get on the RAC summer agenda. It will go on the fall agenda. The TC2.1 vote did not get responses from a quorum, Curt Eichelberger will try to get them to take a vote at meeting on June 27.

Speech privacy in high performance buildings – Erik Miller-Klein has made minor revisions to the RTAR prepared by Ken Roy. It was distributed to voting members on June 26, and voted on at Main Committee meeting same day. Vote 7-0-0-0.

Inlet and Outlet System Effects on Multiple Plenum Fans in a Parallel Arrangement for Air and Sound Performance. --TC 5.1submitted an RTAR, returned with comment, but have not seen comments yet. Kim Osborn is our representative with TC 5.1.

ASHRAE TC 2.6 Programs Subcommittee Meeting Minutes

Meeting Date: June 25, 2017

Programs Subcommittee Meeting Overview:

- Plan TC 2.6 program submissions for next two meetings
  - Long Beach, CA 2017 (June 24 – 28, 2017)
  - Chicago 2018 (January 20 – 24, 2018)
  - Houston 2018 (June 23 – 27, 2018)
- Discuss tentative TC 2.6 program ideas for future meetings
  - Atlanta 2019 (January 12 – 16, 2019)
  - Kansas City, MO 2019 (June 22 – 26, 2019)

Definitions:

- Technical Papers
  - Submitted directly by author
  - More involved papers usually detailing research or similar activities
  - Maximum of 30 pages
  - Rigorous double-blind review process; subject to commercialism review
  - Longer timeline for development and approval
  - Published in *Transactions*
  - Due Completed 1 month after conference for review and presentation, for conference 1 year from current conference.
    - Example: March 1, 2017 for January 2018 Conference
- Conference Papers
  - Submitted directly by author
  - Less rigorous than technical papers
  - May highlight case studies or ongoing research
  - Maximum of 8 pages
  - Single blind review process; subject to commercialism review
  - Shorter timeline for development and approval
  - Abstract Due 1 month after conference, approval/rejection within 1 month, full paper due in 6 months, for conference 1 year from current conference.
- Seminars/Workshops/Forums
  - Session chairs and speakers selected by TCs
  - Program submitted by session chair
    - Submissions must include selected speakers, bios, abstract, learning objectives, Q&A
  - Speakers must submit presentations 1 month prior to meeting for commercialism review
  - Seminars
    - 60 minutes: 1 – 2 presentations
    - 90 minutes: 3 – 4 presentations
  - Workshops (new in Summer 2014)
    - One chair and two presenters (maximum)

- 60-minute length only: 30 minutes for presentations + 30 minutes for discussion

o Forums
- One moderator
  60-minute length only: no presentations

Upcoming Conference Program Tracks:

Long Beach 2017 (June 24 – 28, 2017)

Track 1 Fundamentals and Applications
Track 2 HVAC&R Systems and Equipment
Track 3 Refrigeration
Track 4 Building Life Safety Systems
Track 5 Controls: Smart Building Systems and the Security Concerns as Technology Emerges
Track 6 Commissioning: Optimizing New and Existing Buildings and their Operation
Track 7 Net Zero Energy Buildings: The International Race to 2030

Track 8 Residential Buildings: Standards Guidelines and Codes
Latest Standards for Multi-Family Acoustics
Multi-family: IBC, ICC G2-Guidelines, HUD (Novak)
Tones & Background Noise (Wowk)
ISO Noise Rating Buildings (19488) (Swan)

Track 9 Research Summit

Chicago 2018 (January 20 – 24, 2018)

Deadlines:
March 1, 2017 – Conference Paper Abstracts/Technical Papers Due
July 7, 2017 – Conference Papers Due
August 1, 2017 – Seminar, Forum, and Workshop Proposals Due

Potential Programs
Track 1 Fundamentals and Applications
- Sound Traps/Silencers – When are they necessary; E477 round robin (Jerry Lilly)
- End Correction, setting the record straight on AHRI 880 (Alex Michaud or Greg M)
- Sound attenuators and acoustical louvers (how they actually perform vs. how they are designed to perform) (Papadimos)
  - Testing Standard and Acoustical Louvers per E477 compared to current published NR and TL data

Track 2 HVAC&R Systems and Equipment
- Academic & Research Labs: Air Valve Noise, Fume Hoods

Track 3 Standards, Guidelines, and Codes

APPROVED Conference Papers

Submitted together Erik MK, A3 Acoustics & Ed Clark, ZGF

- Opportunities for human centric acoustic design metrics in codes and standards
- Opportunities for human centric lighting design metrics into codes and standards

Submitted 8/2/17

ASHRAE 189.1 – Acoustics	Erik M-K
ASHRAE 189.1 Acoustics User's Manual	Michael Schmeida
Related Codes, Standards & Guidelines	Joe Bridger
(*Depending on 189.1 Vote* – APPROVED)	

Track 4 Earth, Wind & Fire

- Track Chair Requested Seminars at Chair Breakfast: Seismic/Vibration Isolation
    - Pat Marks & Matthew Hooti, TC 2.7
    - Resiliency of buildings and communities: Seismic/Vibration Isolation
        - Nate Deibler, Mason – Plumbing/Flexible Couplings
        - Roman, Acoustics combined with or in opposition with resilient design

Track 5 Transportation IAQ and Air Conditioning

- Jack Wang, Thermo-King and ASME colleagues?

Track 6 Tall Buildings
Track 7 Modeling Throughout the Building Life Cycle
Track 8 Heat Exchange Equipment
Track 9 Refrigerant Mini Track @ Expo

Program Topics

February 10, 2017 – Seminar, Forum, and Workshop Proposals Due

Conference	Subject	Type	Status	Session Organizer
Long Beach 2017	**Track 8 Residential Buildings: Standards Guidelines and Codes** *Latest Standards for Multi-Family Acoustics* Multi-family: IBC, ICC G2-Guidelines, HUD 189.1 ISO Noise Rating Buildings (19488)	Seminars	Cathleen Novak Roman Wowk Jason Swan	Erik M-K
Chicago 2018	**Technical Paper Session (no specific track)** (August 29th, 2016 Submission deadline)	Technical Paper Session	After RP approved	Doug Reynolds
Chicago 2018	**Track 3 Standards, Guidelines, and Codes** Human Centric Design for Acoustics Human Centric Design for Lighting	Conference Paper	Erik M-K Ed Clark	Erik M-K
Chicago 2018	**Track 3 Standards, Guidelines, and Codes** ASHRAE 189.1 – Acoustics ASHRAE 189.1 Acoustics User's Manual Related Codes, Standards & Guidelines (*Depending on 189.1 Vote*)	Seminar	Erik Miller-Klein Michael Schmeida Joe Bridger	Erik Miller-Klein

Hot Topic – Subcommittee Presentation
Invite outside special topic speaker to meetings, listed in the ASHRAE schedule and available to both TC 2.6 and larger organization.

- Speakers can be video-conferenced for this special session

If you want a special seminar in the program, it must be scheduled during main meeting time, and not subcommittee time.

Future (not discussed)

- Elevator Noise Control (Lilly)
- Electrical Noise: transformers, electrical motors (Papadimos)
- Sound attenuators and acoustical louvers (how they actually perform vs. how they are designed to perform) (Papadimos)
- Discussion of Classroom Acoustics Standard ANSI S12.60 that has been adopted by the ICC as code (Bridger)
- Predictions vs. Laboratory vs. Field Testing (Papadimos & Marks)

Other Notes

- Session organizer should focus on content of abstracts (especially the abstract for the session) to make sure abstracts are good. Track chairs look at abstracts to determine if session will be accepted or not.
- Session organizers should compile all information for submitted sessions in word document, so that the sessions can be easily resubmitted for future conferences if session is rejected.
- It is now mandatory for speakers to use an ASHRAE-developed template for all presentations at meetings (choices of templates are available on ASHRAE website).

Attendees:

	Name	E-mail
1	Roman Wowk	roman@papadimosgroup.com
2	Raj Prime	
3	Erik Miller-Klein	erik@a3acoustics.com
4	Greg Meeuwsen	gmeeuwsen@trane.com
5	Brent Fullerton	
6	Jim Kline	Jim.kline@intertek.com
7	Tim Mathson	tmathson@greenheck.com
8	Dave Aquilina	daquilina@Kineticsnoise.com
9	Robert Hassler	rhassler@kineticsnoise.com
10	Karina Saenz Acosta	karinaa@aaon.com
11	Curt Eichelberger	curtis.eichelberger@jci.com
12	Michael Schwob	
13	Trevor	Tecoustics
14	Kim Osborn	Nortek Air Solutions
15	Matthew Hooti	mhooti@isotechindustries.com
16	Jason Swan	jasons@sandybrown.com
17	Adam Sterne	asterne@acmefan.com

Reference Information: Track Descriptions

Chicago 2018 (January 20 – 24, 2018)

Deadlines:
March 1, 2017 – Conference Paper Abstracts/Technical Papers Due
July 7, 2017 – Conference Papers Due
August 1, 2017 – Seminar, Forum, and Workshop Proposals Due

- **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, psychrometrics, 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 more tall 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 Firrantello

  Email: j.firrantello@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

Houston 2018 (June 23 – 27, 2018)

Deadlines:
August 28, 2017 – Conference Paper Abstracts/Technical Papers Due
December 8, 2017 – Final Conference Papers Due
February 9, 2018 – Seminar, Forum, and Workshop Proposals Due

Track 1: HVAC&R Systems and Equipment

Track Chair: Frank Schambach
Email: frankschambach@mindspring.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: Dennis Alejandro
Email: denzjac@yahoo.com

Fundamentals are the foundation for understanding applications in engineering. Key components of ASHRAE fundamentals include thermodynamics, psychrometrics, fluid and mass flow. 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: District Energy and Cogeneration Plants

Track Chair: Kimberly Pierson
Email: kdpwildcat@gmail.com

As our world resources become more and more sparse there is an industry-wide movement toward efficiency and sustainability. One of the ways in which we can look to minimize our carbon footprint is to combine our resources. District energy systems and cogeneration plants do just that and are quite popular in some locales but have yet to gain traction in other developed cities. We will look at the advantages and limitations, do's and don'ts and best practices of utilizing this type of shared system.

Track 4: Safeguarding your HVAC&R System

Track Chair: Rich Rose
Email: richr@mticontrols.com

From seismic events to power outages and human error, how secure is your HVAC&R System? Mechanical, plumbing, electrical, and control systems all work together to create our living buildings, so it is imperative that designers and operators take into account the reactivity and interaction of these systems in response to natural disasters, human interference and other catastrophic events. Topics in this track include considering your design layout and accessibility, backup systems, supports and bracing, and more.

Track 5: Residential - Modern Buildings in Hot and Humid Climates

Track Chair: Dimitris Charalambopoulos
Email: dimitris@ashrae.gr

Residential dwellings require designers to consider a different scope of building functions, occupant use, and comfort. With increasing utility rates and a movement toward net zero housing,

the traditional residential design models are continuously diversifying and evolving. This track will discuss how we can integrate modern residential design and building practices into hot and/or humid climates with specific challenges ranging from indoor comfort to ventilation and mold.

Track 6: Professional Skills

Track Chair: Kevin Marple
Email: kmarple@benzco.com

This track is designed to provide professionals an opportunity to develop in the areas of presentation skills, leadership, teambuilding, understanding various business operations, interpersonal skills, etc. In short, the Professional Skills Track can cover all aspects of business outside of engineering/technical applications and lends itself to interactive session types such as workshops and forums.

Track 7: Research Summit

Track Chair: Melanie Derby
Email: derbym@ksu.edu
Active research, and the exchange of those research findings are critical to the development of our HVAC&R industry and environment. The sixth annual research summit invites researchers to share those results; and this year we announce an exciting collaboration with ASHRAE's archival research publication, *Science and Technology for the Built Environment* (STBE). Researchers are invited to present papers, seminars, forums or participate in panel discussions. Authors may also pursue an opportunity to further develop their submissions for later publication in STBE

Track 8: HVAC&R Control Freaks

Track Chair: Gary C. Debes
Email: gcdebes@verizon.net
This track will focus on all things controls (note: please see track 9 "MiniTrack" as well). We invite you to join this exchange addressing one of the most dynamic areas in HVAC&R. Topics may range from design innovations spreading through our industry to the latest in building integration and observation, or even troubleshooting the most common issues occurring in building management systems.

Track 9: HVAC&R Analytics

Track Chair: Vikrant Aute
Email: vikrant@umd.edu
This track will focus on the application of analytics algorithms/tools to automate systems. The tools and data are readily available, but the challenge is in using them in a timely and effective manner to add value to our HVAC&R Systems. By discussing the basics of analytics, methods, case studies and lessons learned we can consider if machine learning is ready to replace conventional controls.

For information on the technical program, special events, special sessions and general conference inquiries.
Conference Program Chair:
Cindy Moreno
Email: cindym@tmmechanical.com

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**

TC2.6 Publications Subcommittee Updates

Steve Wise was unable to attend the Long Beach, CA meeting and provided status updates by email on 6/23/17):

At the present time, Pubs is focused on two areas in Chapter 48.

We are contemplating expanded the Outdoor Noise section. There have been some requests to offer guidance that could be used to craft or interpret noise ordinances…….or perhaps at a minimum to suggest criteria (as we certainly do for indoor noise).

Volunteers including: Reggie Keith, Jason Swan, Roman Wowk, Jerry Lilly, Erik Miller-Klein……have begun to circulate some e-mail suggestions. This topic is also on the radar of ASHRAE T.A.C., per Dustin Meredith.

We are also looking at the Vibration Control section. This will perhaps add Transformers and Fan Arrays to Table 47, and develop some links that will allow on-line readers to click on a particular piece of equipment that will then show on one page all the notes, etc., readily readable.

Current volunteers are: Curt Eichelberger, Matthew Hooti, Eric Sturm, Erik Miller-Klein, Karina Saenz, Don Warick, Robert Simmons, Patrick Marks, Michael Schmeida, Chris Papadimos, Trevor Caldwell, Nate Deibler, Karl Peterman, Reggie Keith, Jerry Lilly, Mike Schwob.

The fan array hot topic will help to kick this off.

On another subject, I personally would like to see our voting member roster expand a bit. We have the largest ASHRAE TC in terms of corresponding members. We have far larger attendance for our TC sub-comms and main meeting than any other TC.

Our scope is diverse, and criteria/data sources/remedies, etc. can be viewed from various perspectives that make consensus a challenge. We should make sure that our guidelines reflect all interests.

As such, perhaps we should strive at a minimum to have a distribution of affiliations among our voting members, as listed below. Especially in regard to research projects, we should be careful that we do not have too few people actually voting to approve something that may not be in the best interest of the full committee majority.

We need at least 11, I believe, and some of these categories could have 2-3 each.
Consultant
Academic
International
Fan Mftr
AHU Mftr
Chiller Mftr
Pump/Compressor Mftr
Damper/Grille/Diffuser Mftr
Silencer Mftr
Vibration Control Mftr
Acoustic Treatment (panels/wraps, etc.) Mftr.

Vibration Isolation Sub-Committee:

- We had a teleconference on May 4th to address the initial urgency about screw chiller isolators and It turned out that after we all carefully read Note 8 we decided it said all that was necessary, so the conclusion was to just add a highlight “SEE NOTE 8”. We also discussed that the main table should include Transformers and Fan Arrays. There is now a “hot topic” planned for Long Beach about Fan Array Isolators, perhaps at/after that meeting we can add some notes, etc to this chapter.

- On another topic, we discussed getting in touch with ASHRAE about how to enhance our on-line version of the chapter. Mike Owen mentioned that ASHRAE will try to accommodate whatever we request. The format we have includes a picture of the equipment and all the relevant notes and proper isolator based on the equipment type and floor span. One comment was that the main title must be change to SELECTION GUIDELINE FOR VIBRATION ISOLATORS from SPECIFICATION OF VIBRATION ISOLATORS. Also there must be more clarity on the acronyms we have on the table.

- Eric Miller-Klein, Trevor Caldwell, Roman Wowk, Steve Wise and Matthew Hooti are the volunteers to prepare the PDFs required for hyperlinks that condense all the info onto one page view for the new format.

- I encouraged everyone to share successful case studies for Vibration Isolation; hopefully we can incorporated them in our table in the long run.