ASHRAE

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	February 24th, 2016
TC/TG/MTG/TRG TITLE	Sound and Vibration		
DATE OF MEETING	January 25th , 2016	LOCATION	Orlando, Florida

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Voting Members: Joseph Bridger John Dunlap Robert Hassler Dan LaForgia Patrick Marks Erik Miller-Klein Chris Papadimos Raj Prime Lauren Ronsse Jason Swan **Corresponding Members:** Zvirimumwoyo Chinoda Ashish Desai Curt Eichelberger Radha Ganesh Reginald Keith Jim Kline Jerry Lilly Greg Meeuwsen Paul Meisel Gregory Miller Andrew Mitchell Karl Peterman Douglas Reynolds Asad Sardar Robert Simmons Jack Wang Don Warick Steve Wise Roman Wowk		**Voting Members:** Victor Clemente Matthew Murello Kenneth Roy Michael Schwob Terence Tyson **Corresponding Members:** Rami Alkhalil Jeffrey Babich Mark Bastasch Umberto Berardi Nathan Blum Jeffrey Boldt Norman Broner Todd Busch Peter Bushnell David Carroll Nicole Cuff Martin Deveci Erroll Eaton Ronald Eligator Mark Fly Michael Froehlich Kevin Gaghan Jason George Lewis Goodfriend Brian Guenther Ali Kemal Guney Arthur Hallstrom Ali Herfat Joseph Horesco		**Visitors:** David Bloom Joe Brooks Scott Campbell Naira Campbell-Kyvreghyan Franco Cincotti Lawrence Copley David Herrin Kenny Hightower Matthew Hooti Larry Hopkins John Iacobellis Diane Jakobs Andrew Jenkins Tim Kuski Tim Mathson Jennifer Smith Angela Waters Greg Nortz Trevor Caldwell Brent Fullerton Jack Stegall William Nelson Chris Dziedzic Michael Woodford

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Randal Zimmerman Ahmed Mohamed **Provisional Corresponding Members:** Mahmoud Mahmoud Jeremy Stockmans Ashish Tripathi		Michael Keating Manoj Khati Marvin Kloostra Will Kowald Kevin Lai Eddie Lau Robert Lilkendey Parag Maruthuria Charles Mattocks Dustin Meredith Alexander Michaud Ralph Muehleisen Jose Nepomuceno Patrick Oliver Kim Osborn John Pappas Richard Peppin James Pooler Michael Resetar Brian Reynolds William Rockwood Erica Ryherd Benjamin Sachwald Mark Schaffer Ken Shook Tim Simcoe John Sofra Michael Spencer William Stewart Eric Sturm Nicholas Sylvestre-Williams Lily Wang Zhiping Wang Jonathan Weinstein Jack Zybura **Provisional Corresponding Members:** Nate Deibler Mark Long Jane Miller John Wang		

DISTRIBUTION

All Members of TC/TG/MTG/TRG plus the following:	
TAC Section Head:	Bert Phillips
TAC Chair:	Tom Lawrence
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters:	Chris Fudge Pawel Wargocki Cyrus Nasseri Michael Vaughn
Manager Of Standards: Manager Of Research & Technical Services:	Stephanie Reiniche Michael Vaughn

ASHRAE TC 2.6 Sound and Vibration Control
Main Committee Meeting Agenda

2:15-4:15 PM Monday, January 25th 2016
Orange G Room– Hilton Hotel – Orlando FL
NOTE: **All Task Group Chairs and Subcommittee Chairs are asked to submit written report to the Secretary (Andrew Mitchell) before Friday February 12th 2016.**

1. **Call to order** (LaForgia) [3 minutes]
   - 1.1. Read scope of TC 2.6
     - 1.1.1. New scope was approved and will be posted to the website within the next few days.
       Title: Technical Committee 2.6, Sound and Vibration
       Scope: TC 2.6 is concerned with the fundamental scientific and engineering principles of sound and vibration, particularly as applied to the design and performance of the built environment.
   - 1.2. Read 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. **Erik Miller-Klein (1st), Jason Swan (2nd), 10-0-0-5-CV**
5. **Secretary's report** (Mitchell) [3 minutes]
   - 5.1. All task group chairs and subcommittee chairs need to submit written reports to Andrew Mitchell by Friday, February 12th.
6. **TC Chair's meeting report** (LaForgia) [5 minutes]
7. **Chair's announcements and correspondence** (LaForgia) [3 minutes]
8. **Subcommittee reports (written reports to be provided to Secretary)**
   - 8.1. **Research Subcommittee** (Eichelberger) [20 minutes]
     - 8.1.1. Research Chair's meeting report
     - 8.1.2. Ongoing research projects
       - 8.1.2.1. RP-1408 The effect of lining length on the insertion loss of acoustical duct liner with PI Reynolds/UNLV (Lilly)
         - 8.1.2.1.1. UNLV submitted draft report to PMS, which is currently under review; expect review to occur within 1-month.
         - 8.1.2.1.2. PMS recommends a no cost extension to July 31, 2016 (target completion date for final report). **Vote: Jason Swan (1st), Robert Hassler (2nd), 10-0-0-5-CV.**
       - 8.1.2.2. RP-1529 Full frequency numerical modeling of sound transmission in and radiation from lined ducts PI Herrin/UK (Marks)
         - 8.1.2.2.1. PMS met on 1/25; agreement looks good. Draft final report has been submitted and planned for review within 2-weeks (teleconference scheduled); vote to be handled by email ballot.
         - 8.1.2.2.2. Currently operating under no cost extension to January 31, 2016. Vote for no cost extension to July 31, 2016; **Pat Marks (1st) , Jason Swan (2nd), 10-0-0-5-CV.**
     - 8.1.3. Work Statements/RTAR's/URP's

8.1.3.1. RTAR-1707 Annoyance Threshold of Tones in Noise as related to building services equipment (L. Wang)
8.1.3.1.1. TC voted to approve, RTAR returned. Voted on work statement last meeting and TC2.1 voted to co-sponsor.
8.1.3.2. RTAR- 1754 Developing the standard test method for Dynamic Characteristic of Vibration Isolators (J. Wang)
8.1.3.2.1. RAC conditionally approved and the vibration isolation subcommittee moving forward to draft.
8.1.3.3. RTAR-*** Speech privacy in high performance buildings (Roy)
8.1.3.3.1. 2.1 cosponsor.
8.1.4. Topics for future research
8.1.4.1. TC 5.3 (air distribution) requested co-sponsorship from TC 2.6 for a project relating to a methodology to predict sound levels in the occupied space from underfloor air distribution (UFAD) equipment and ductwork. Randy Zimmerman and Chris Buroughs are working on this from TC 5.3; Greg Meeuwsen and Chris Papadimos from TC 2.6 are assisting.
8.1.4.2. Current priority of future research topics
8.1.4.2.1. Room effect
8.1.4.2.2. Plumbing noise
8.1.4.2.3. Fluctuation criteria
8.1.4.2.4. Dynamic properties of building floor/ceiling constructions
8.1.4.2.5. Noise intrusion from outside or adjacent interior spaces
8.1.4.2.6. Non-fibrous duct liners
8.1.4.2.7. Flow noise generation in ducts, fittings, louvers and dampers
8.1.4.2.8. Criteria (basis for values used in the handbook); thought is to have something more evidence based
8.1.4.3. Continuation of RP 1529. Now that we have results of RP-1529, next steps will be a Hot Topic session in St. Louis to discuss how we can build off this research.
8.2. **Programs Subcommittee** (Ronsse) [15 minutes]
8.2.1. Program Chair's meeting report
8.2.2. Programs this meeting
8.2.2.1. Seminar: Acoustics in Multi-Family Residential Environments (Papadimos: *Wowk, Murello, Miller-Klein, Swan*), Sunday, January 24, 1:30 – 3:00 PM, Orange Ballroom A (Hilton Orlando)
8.2.2.2. Seminar: Avoiding Pesky Pitfalls Integrating Seismic and Sound Control (Troutman: *Simmons, Lilly*), Tuesday, January 26, 1:00 – 2:00 PM, S331BC (Orange County Convention Center)
8.2.2.3. Hot topics this meeting
8.2.2.3.1. Discussed Algorithms for HVAC Acoustics text in a combined session with Criteria.
8.2.2.3.2. Next steps
8.2.2.3.2.1. There is an interest in updating the text; the format for an update is unclear (i.e. print, ebook, software, etc.).
8.2.2.3.2.2. General consensus to reconvene Algorithms subcommittee meetings and utilize the Criteria sessions. A 1-hour session will be held as part of the St. Louis meeting in June 2016.
8.2.3. Potential programs next meeting – St Louis MO

8.2.3.1. Submit session in Tract 6, Indoor Environment (workshop discussing implementation 189.1).
8.2.3.2. Seminar in same tract, design of healthcare facilities.
8.2.3.3. Tract 2, research summit; several talks – update on TC2.6 research, vibration control, speech privacy.
8.2.3.4. TC 2.1, acoustic/thermal interactions.
8.2.4. Las Vegas
8.2.4.1. Air distribution systems, ASHRAE standard 200 on chilled beams (Peterman), fan powered boxes (Zimmerman).
8.2.4.2. Case studies in predicted noise versus actual noise (Papadimos).

8.3. **Publications Subcommittee** (Wise) [10 minutes]
8.3.1. Handbook chapters
8.3.1.1. Handbook Applications 2019 (Wise)
8.3.1.1.1. Vibration isolation section and table should be coordinated with TC2.7 (seismic chapter) for terminology.
8.3.1.2. Handbook Fundamentals 2017 (Wise)
8.3.1.2.1. Vote to submit revisions to Fundamentals 2017; Pat Marks (1st), John Dunlap (2nd) (10-0-0-5-CV)
8.3.2. Other publications
8.3.2.1. Algorithms for HVAC Acoustics (Miller)
8.3.2.1.1. Suggest coming to decision on how to update (i.e. update publication, create libraries for calculation elements that developers could utilize, or develop the software itself).
8.3.2.1.2. Doug Reynolds offered to give calculation tool and source code to ASHRAE.
8.3.2.2. Application of Manufacturers' Sound Data
8.3.3. Web page (Schwob)
8.3.3.1. Refer to Publications subcommittee meeting minutes.

8.4. **Standards Subcommittee** (Clemente) [20 minutes]
8.4.1. SPC 130 – Method of Test for Rating Ducted Air Terminal Units (Zimmerman)
8.4.1.1. Went out for public review 12/15/15. Nothing else to discuss at this time.
8.4.2. SPC 189 – Design for High Performance Green Buildings (Miller-Klein)
8.4.2.1. Working with Working Group 8 on edits to acoustics sections and is up for vote on 1/27/16.
8.4.3. SPC 197 – Method of Test for Passive Vibration Isolators (J. Wang)
8.4.3.1. Waiting for research project work statement to be completed.
8.4.4. SPC 200 – Method of Test for Chilled Beams (Zimmerman)
8.4.4.1. Complete and is in bookstore. During course of implementing certification, there were several errors that were discovered that are being addressed.
8.4.5. Updates from Other Standards Organizations
8.4.5.1. AHRI (Daniel Abbate)
8.4.5.1.1. New standards on website:
8.4.5.1.1.1. AHRI 270-2015, Sound Rating for Outdoor Unitary Equipment.
8.4.5.1.1.2. AHRI 300-1500, Sound Rating and Sound Transmission Loss of Packaged Terminal Equipment.
8.4.5.1.1.3. AHRI 350-2015, Sound Rating of Non-ducted Indoor Air-conditioning Equipment.

8.4.5.1.1.4. ANSI/AHRI 370-2015, Sound Performance Rating of Large Air-cooled Outdoor Refrigeration and Air-conditioning Equipment.
8.4.5.1.1.5. ANSI/AHRI 1260-2014, Sound Power Rating of Water-cooled Chillers.
8.4.5.1.1.6. New application standard for unitary large equipment rated per 370.
8.4.5.1.1.7. Work on 375 started at last meeting (will be similar to 275 but for larger equipment).
8.4.5.1.1.8. Moving closer to a chilled beam certification program (monitor website for updates).

8.4.5.2. AMCA (Joe Brooks)
8.4.5.2.1. Standard 51 rating fans (1 “no” vote has to be resolved).
8.4.5.2.2. AMCA released new method of test for sand louvers.
8.4.5.2.3. Efficiency of fan based on calculation method (working with ISO, TC 117).
8.4.5.2.4. Working on system effects publication with TC 117.

8.4.5.3. ANSI (Ali Herfat)
8.4.5.3.1. Working Group on Sound Measurement in Rooms (Lilly)

8.4.5.4. ASTM (Peppin); E33 (Lilly)
8.4.5.4.1. Major revisions to ASTM E477, round robin study currently underway, waiting on data for two (2) labs.

8.4.5.5. ISO (Reynolds); ISO TC205/TC43.2 (Roy)
8.4.5.5.1. Acoustic standard in development (similar to product rating system) applying acoustics to a building.

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

8.5.1. Sound Criteria (Mitchell)
8.5.1.1. During the criteria subcommittee meeting, Greg Miller led a discussion on the Algorithms for HVAC Acoustics text, and the potential update of it. A 1-hour session will be held as part of the St. Louis meeting in June 2016 during the Criteria time slot.

8.5.2. Vibration Isolation (J. Wang)

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

8.6.1. Honors and awards (Miller-Klein)
8.6.1.1. Pat Marks has been named an ASHRAE Fellow.

8.6.2. Long range planning (LaForgia)
8.6.2.1. Discussion in executive committee meeting to reinstitute long range planning meeting (looking approximately 5 years out).

8.6.3. Membership (Schwob/LaForgia)
8.6.3.1. Currently, fifteen (15) voting members. Reminder that voting terms are one (1) year, extended for up to four (4) years, and that all voting members need to participate in votes.

8.6.4. Liaisons (Miller-Klein)
8.6.4.1. International Green Construction Code update (Miller-Klein)
8.6.4.1.1. Taken up by 189.1
8.6.4.2. ASHRAE TC 2.1 Physiology and Human Environment (L. Wang)
8.6.4.2.1.
8.6.4.3. ASHRAE TC 2.7 Seismic and Wind Restraint Design (Peterman)
8.6.4.3.1. Research project started related to the effect of wind screening. Currently, there is no allowance for wind screening. ASHRAE has funded research along with IBHS institute.

8.6.4.3.2. 2.7 name change to “Seismic and Wind Resistant Design”.

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

8.6.4.4.1. Fans and system effects; report compiled that will take data acquired in 3 reports (vane axial, centrifical, prop, and plenum fans) and will include all data on system effects for adding sound.

8.6.4.5. ASHRAE TC 5.2 Duct Design (Hassler)

8.6.4.5.1. Duct Design Guide

8.6.4.5.2. Duct fitting database

8.6.4.5.3. Testing to verify CFD of back to back elbows, U, and Z configuration.

8.6.4.6. ASHRAE TC 5.3 Room Air Distribution (Zimmerman)

8.6.4.6.1. RTAR for underfloor sound.

8.6.4.6.2. AHRI 880/885 Air Terminals

8.6.4.6.2.1. No updates

8.6.4.6.3. AHRI 1240 Performance Rating of Chilled Beams

8.6.4.6.3.1. Finished; working to find test facilities to conduct testing.

8.6.4.7. ASHRAE TC 6.10 Fuels and Combustion (Herrin)

8.6.4.7.1. No updates.

8.6.4.8. ASA (L. Wang)

8.6.4.8.1. Next meeting in SLC end of May.

8.6.4.9. VISCMA (Peterman)

8.6.4.9.1. Suggested checking out website for updates (incremental changes have been made, white papers added, etc.); working on a LinkedIn page to follow.

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

8.6.4.10.1. CTI – Erik Miller-Klein to present at conference in Houston (February 2016) on ATC 128, field testing SPL, back calculating Lw, and the differences in sound power levels that can occur.

8.6.4.10.2. INC – Noisecon in Providence, RI, (June 12-15), special session on HVAC systems noise control.

8.6.4.10.3. NCAC – meeting in Chicago (September 16-18). ANSI S12.60 has been adopted into ICC (International Codes Council), section 808.

8.6.4.10.4. FGI Guideline, for 2018 revision cycle, section on outpatient and long term care facilities is being revamped, anticipate voted on 1st quarter of this year.

8.6.4.10.5. CIBSE – No updates

8.6.4.10.6. EGSA – 5th edition, Onsite power generation - a comprehensive guide to onsite power (egsa.org).

9. New business/Old business [5 minutes]

9.1. Finalize Scope of Committee(LaForgia)

9.1.1. Loren stepping down from Programs; Erik taking over tentatively.

9.1.2. Victor unable to continue Standards; Joe Bridger to take over that group, and Criteria, which will be combined.

10. Next meeting date and location – St Louis MO – June 25th -29th 2016

11. Adjournment

11.1. **Jason Swan (1st) Erik Miller-Klein (2nd)**

ASHRAE TC2.6 Research Subcommittee Report, 01/25/2016, Orlando, FL.

Curt Eichelberger (curtis.eichelberger@jci.com)

Highlights of Research Chair's meeting:

- Our new research liaison is Pawel Wargocki. Our Research Liaison, should review all RTARs and WSs before submittal to RAC (RL2@ashrae.net). Please copy Curt Eichelberger (curtis.eichelberger@jci.com) on all correspondence with the Research Liaison.
- RAC is interested in ideas for disseminating results of ASHRAE research projects to public and wider audience.
- RTARs should reference elements of the Strategic Plan.
- WSs should have a clearly defined *Stage* ***Funding and Project Monitoring***. At the end of each phase there should be well defined deliverables and payments (based on % of total project cost), so that the PMS can assess the feasibility of the next phase and contractor's ability to complete the remainder of the project.
- Co-sponsoring TC's need to participate in the RTAR and WS preparation.
- For RTARs and WSs that are conditionally accepted, provide a cover letter addressing each comment.
- RAC meets minimum of 3 meetings on March 15, August 15 and December 15. WS and RTARS should be reviewed by the Research Chair and Research Liaison, and submitted to RAC at least one month before these deadlines.

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. With the help of Price Industries, over 200 tests on round and rectangular straight ducts have been completed. A draft report was submitted and is currently being reviewed by the PMS.

PMS recommends a no-cost extension to July 31, 2016, during the Orlando meeting. This is the target completion date for the final report.

RP-1529 Full frequency numerical modeling of sound transmission in and radiation from lined ducts – Pat Marks, PMS Chair. Dr. David Herrin, University of Kentucky, principle investigator. This project will develop and validate full-frequency numerical modeling techniques for sound transmission through, and radiation from, HVAC ductwork. The PMS returned editorial comments to the draft report and we expect an email ballot before the next meeting. Also, two papers were submitted and presented in the Orlando meeting.

This project is currently operating under a no-cost extension to July 31, 2016.

Work Statements/RTARs:

WS-1707 Annoyance thresholds of tones in noise as related to building services equipment. Lily Wang championed this RTAR. TC 2.6 unanimously voted to approve the WS, and TC 2.1 unanimously voted to co-sponsor the WS at the Atlanta meeting. RAC returned the WS with comments. Curt Eichelberger will coordinate the edits with those members who initially helped to write the WS.

RTAR-1754 - Developing the standard test method for dynamic characteristics of vibration isolators. Jack Wang and Jerry Lilly are championing this RTAR. RAC conditionally approved the RTAR and the Vibration Subcommittee is moving forward with drafting the Work Statement.

Speech privacy in high performance buildings – Ken Roy prepared a RTAR and reviewed with members at the Research Subcommittee meeting. Next steps is to forward the draft to TC 2.6 and TC2.1 members for review and comment. We will also solicit support from Environmental Health Council. Joe Bridger volunteered to champion this RTAR moving forward.

Sound attenuation of underfloor air systems – TC 5.3, Air Distribution, requested that TC 2.6 co-sponsor a project relating to a methodology to predict sound levels in the occupied space from UFAD equipment and ductwork. TC 5.3 champion is Chris Buroughs. TC 2.6 members Randy Zimmerman, Greg Meeuwsen, and Chris Papadimos to coordinate with TC 5.3.

Topics discussed and prioritized for future research:

The top topics discussed during the research subcommittee meetings are listed below in order of priority.

1. **Room effect** (10 votes) – Revisit and provide more clarity on how to calculate the room effect in the Handbook. This would include the effect of single pass ceiling systems and ceiling plena. Joe Bridger agreed to champion this topic and prepare an RTAR, along with Ken Roy and Erik Miller-Klein. This task should start with a good literature review.

2. **Plumbing noise** (8 votes) (defined in terms of flow and pressure drop) – PEX piping. Relationship between air-borne and structure-borne. Canadian data? Champion Erik Miller-Klein, Jerry, Chris

3. **Fluctuation criteria** (6 votes) – Objective would be to develop a metric for Criteria section of Handbook. Criteria subcommittee decided to work on tone criteria first.

4. **Dynamic properties of building floor/ceiling constructions** (5 votes) – Need Champion.

5. **Noise intrusion from outside or adjacent interior** spaces (3 votes) – Champion: Erik Miller-Klein.

6. **Non-fibrous" duct liners** (3 votes) – Application related, not product ratings. No champion for this topic at this time.

7. **Flow noise generation in ducts, fittings, louvers and dampers** (2 votes) – Looking for a champion for this topic. We need a volunteer to do a literature review, as some of this information may already be published.

8. **Criteria** (2 votes) – What is the basis for values that were chosen for room use. Need evidence based, rather than accepted design practice.

Added topics that were discussed, but not prioritized, include:

Numerical methods – Next steps from RP-1529. Suggestion to schedule a hot topic on this the next meeting. Objective is to Need more definition of this topic.

ASHRAE TC 2.6 Programs Subcommittee Meeting Minutes

Meeting Date: January 24, 2016

Subcommittee Chair: Lauren Ronsse

Meeting Attendees: Lauren Ronsse, Erik Miller-Klein, Richard Zhang, Dan LaForgia, Jerry Lilly, Curt Eichelberger, Roman Wowk, Chris Papadimos, Steve Wise, Jim Kline, Joe Bridger, Lawrence Copley, Jason Swan, Robert Lilkendey, Robert Hassler, Matt Murello, Trevor Caldwell, Kenny Hightower, Brad Gover, Karl Peterman, Gree Meeuwsen, Jerermy Stockmans, Mark Long, Jennifer Nelson Smid, Greg Miller, Reginald Keith, Jack Wang

Programs Subcommittee Meeting Overview:

- Plan TC 2.6 program submissions for next two meetings
  - Saint Louis 2016 (June 25 – 29, 2016)
  - Las Vegas 2017 (January 28 – February 1, 2017)
- Discuss tentative TC 2.6 program ideas for future meetings
  - Long Beach, CA 2017 (June 24 – 28, 2017)
  - Chicago 2018 (January 20 – 24, 2018)

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

Program Topics: Orlando 2016 (January 23 – 27, 2016)

Conference	Subject	Type	Status	Session Organizer
Orlando 2016	**Session Title: Simulating Noise Attenuation in Ducts** • A Simulation Approach to Determine the Insertion and Transmission Loss of Unlined and Lined Ducts (Herrin) • Simulation of Attenuation due to Elbows and Side Branches and Breakout Transmission Loss (Herrin)	Technical Paper Session	Accepted - **Sunday, 1/24, 9:45 – 10:45 AM, Orange Ballroom G (Hilton)**	Dave Herrin
Orlando 2016	**Session Title: Acoustics in Multi-Family Residential Environments** • Plumbing Noise Control Essentials for Multi-Family Residences (Wowk) • Sound Isolation Between Multi-Family Units (Murello) • Using and Understanding AHRI 274: Application of Outdoor Equipment Sound Ratings (Miller-Klein) • Ensuring Mechanical Ventilation and Heat Recovery Systems are Quiet (Swan)	Seminar	Accepted – **Sunday, 1/24, 1:30 – 3:00 PM, Orange Ballroom A (Hilton)**	Chris Papadimos
Orlando 2016	**Session Title: Avoiding Pesky Pitfalls Integrating Seismic and Sound Control** • Taking the Evil Out of Necessary Evil of Design for Seismic Compliance (Simmons) • Preventing Sound and Vibration Problems (Jerry Lilly)	Seminar	Accepted – **Tuesday, 1/26, 1:00 – 2:00 PM, S331BC (Orange County Convention Center)**	Robert Simmons

Hot Topics in Orlando

- Algorithms for HVAC Acoustics: Review of Status and Discussion Regarding the Future (Greg Miller)
  - ASHRAE's publication: Algorithms for HVAC Acoustics (1991) – should it be updated or revised? Results from survey:
    - Significant interest in updating the algorithms
    - Strong preference for electronic publication

        - 2/3 of people on this committee are using commercially available software
        - Significant desire for any update to include ready-to-use software
        - People (on TC 2.6) are willing to pay for it
- TC 2.6 will potentially form a subcommittee to move this effort forward. There will be TC 2.6 meeting time devoted to this at the next meeting in St. Louis.

Upcoming Conference Program Tracks:

Saint Louis 2016 (June 25 – 29, 2016)

Deadlines:
September 14, 2015 – Conference Paper Abstracts Due
September 14, 2015 – Technical Papers Due
January 4, 2016 – Conference Papers Due
February 8, 2016 – Seminar, Forum, and Workshop Proposals Due

Track 1 Advances in Refrigeration Systems and Alternative Refrigerants
Track 2 Research Summit
Track 3 Fundamentals and Applications
Track 4 HVAC Systems and Equipment
Track 5 Smart Building Systems/Remote Monitoring and Diagnostics
Track 6 Indoor Environment: Health, Comfort, Productivity
Track 7 Professional Skills Beyond Engineering
Track 8 Renewable Energy Systems and Net Zero Buildings

Las Vegas 2017 (January 28 – February 1, 2017)

Deadlines:
March 14, 2016 – Conference Paper Abstracts Due
April 18, 2016 – Technical Papers Due
June 6, 2016 – Conference Papers Due
August 8, 2016 – Seminar, Forum, and Workshop Proposals Due

Track 1 Fundamentals and Applications
Track 2 HVAC&R Systems and Equipment
Track 3 Water-Energy Nexus
Track 4 Commercial and Industrial IAQ
Track 5 Mission Critical Design and Operation
Track 6 Effects of Climate Change on HVAC&R
Track 7 Energy Efficient Industrial Buildings
Track 8 Building Operation and Maintenance

Program Topics: Saint Louis 2016 (June 25 – 29, 2016)

February 8, 2016 – Seminar, Forum, and Workshop Proposals Due

Conference	Subject	Type	Status	Session Organizer
St. Louis 2016	**Track 1 Advances in Refrigeration Systems and Alternative Refrigerants** **Track 2 Research Summit** **Track 3 Fundamentals and**			

	Applications **Track 4 HVAC Systems and Equipment** **Track 5 Smart Building Systems/Remote Monitoring and Diagnostics** **Track 6 Indoor Environment: Health, Comfort, Productivity** **Track 7 Professional Skills Beyond Engineering** **Track 8 Renewable Energy Systems and Net Zero Buildings**			
St. Louis 2016	**Track 6 Indoor Environment: Health, Comfort, Productivity** **Session Topic: Implementation of Acoustics in Standard 189.1** • Erik Miller-Klein • Joe Bridger	Workshop	Not submitted, since vote on acoustics content postponed	Erik Miller-Klein
St. Louis 2016	**Track 6 Indoor Environment: Health, Comfort, Productivity** **Session Title: Design of Healthcare Facilities to Meet Standards of Acoustic Performance** • Speech Privacy (Ken Roy) • HCAHPS & Alarm Fatigue (Erik Miller-Klein) • 2014 FGI Guidelines (Kenric Van Wyk)	Seminar	Submitted	Erik Miller-Klein
St. Louis 2016	**Track 2 Research Summit** **Session Topic: Update on TC 2.6 research** • Vibration Control (Jack Wang) • Speech Privacy (Ken Roy)	Workshop	Not submitted, since healthcare session submitted	Erik Miller-Klein
St. Louis 2016	**Session Title: The Building Envelope and its Impacts on Occupant Comfort** • Applying ASHRAE Standard 55 to Building Envelope Design (Sean O'Brien) • The Building Enclosure and its impact on Occupant Comfort (Peter Adams) • Sound Transmission through Building Envelopes (Jerry Lilly)	Seminar	Submitted (Joint with TC 4.04)	Sean O'Brien

	• Building Envelope Acoustics (Roman Wowk)			

Las Vegas 2017 (January 28 – February 1, 2017)

August 8, 2016 – Seminar, Forum, and Workshop Proposals Due

Conference	Subject	Type	Status	Session Organizer
Las Vegas 2017	**Track 1 Fundamentals and Applications** **Track 2 HVAC&R Systems and Equipment** **Track 3 Water-Energy Nexus** **Track 4 Commercial and Industrial IAQ** **Track 5 Mission Critical Design and Operation** **Track 6 Effects of Climate Change on HVAC&R** **Track 7 Energy Efficient Industrial Buildings** **Track 8 Building Operation and Maintenance**			
Las Vegas 2017	**Track 2 HVAC&R Systems and Equipment** **Session Topic: Quieting Air Distribution Systems** • ASHRAE Standard 200 on method of test for chilled beams (Peterman) • Terminal units above and below the occupied space (Zimmerman) • Fan-powered boxes under UFAD systems (Zimmerman)	Seminar	To be submitted	Karl Peterman
Las Vegas 2017	**Track 1 Fundamentals and Applications** **Session Topic: Correlating measured vs. predicted noise in mechanical systems** • Noise prediction software overview • Measurement noise process in laboratories • Applications of Manufacturers' Sound Data • Case study of measured vs. predicted noise in a project	Seminar	To be submitted	Chris Papadimos
Las Vegas 2017 or Long Beach 2017	**Technical Paper Session (no specific track)** **Session Topic: Basics of HVAC Noise Control** • Duct Liner, Breakout & Flanking • Round duct	Technical Paper Session	Possible – official session must happen after RP approved	Doug Reynolds

	• Rectangular • Updated algorithms for insertion loss, break-out			

Future

- 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)

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.
- Is now mandatory for speakers to use an ASHRAE-developed template for all presentations at meetings (choices of templates will be available on ASHRAE website).

Reference Information: Track Descriptions

Saint Louis 2016 (June 25 – 29, 2016)

Deadlines:
September 14, 2015 – Conference Abstracts Due
September 14, 2015 – Technical Papers Due
January 4, 2016 – Conference Papers Due
February 8, 2016 – Seminar, Forum, and Workshop Proposals Due

- **Track 1: Advances in Refrigeration Systems and Alternative Refrigerants**

  Track Chair: Frank Schambach

  Email: frankschambach@mindspring.com

  This track seeks papers and programs that explore the wide range of refrigeration systems under development with special emphasis on the use of alternative refrigerants in vapor compression machines to address environmental concerns.

- **Track 2: Research Summit**

  Track Chair: Jeffrey Spitler

  Email: spitler@okstate.edu

  The fourth annual Research Summit seeks papers that report results on any aspect of ASHRAE-related research including heating, cooling, ventilation, other energy uses in the engineered environment and associated environmental aspects.

- **Track 3: Fundamentals and Applications**

  Track Chair: David E. Claridge

  Email: dclaridge@tamu.edu

  Fundamental information and applications of fundamentals related to all aspects of HVAC&R are welcome. This can range from psychrometric properties and processes to combustion, controls, HVAC system and envelope fundamentals and beyond.

- **Track 4: HVAC Systems and Equipment**

  Track Chair: Alan Neely

  Email: alan_neely@pghcorning.com

  This track will include presentations on best practices to implement traditional, non-traditional, and hybrid approaches to achieve successful HVAC&R systems design. Objectives include high performance systems and equipment, LEED certified designs and sustainable buildings.

- **Track 5: Smart Building Systems/Remote Monitoring and Diagnostics**

  Track Chair: Samir Traboulsi

  Email: traboulsi.samir@gmail.com

  Smart buildings address HVAC&R equipment operation (chiller sequencing, soft start), integration into complete systems and can potentially interface with multiple building complexes and micro grid operation. This track includes papers on advanced communication protocols, system integration, BMS tools, data management and analysis.

- **Track 6: Indoor Environment: Health, Comfort, Productivity**

Track Chair: Dennis Alejandro

Email: denzjac@yahoo.com

Buildings and other enclosed spaces are increasingly required to provide safe, healthy environments in an energy efficient manner. Papers in this track will review the balance between environmental health and energy efficiency in buildings and help define future education, policy and research directions.

- **Track 7: Professional Skills Beyond Engineering**

  ### Track Chair: Rachel Romero

  Email: rachel.romero@nrel.gov

  This track seeks to ensure professional skills are bing developed and maintained beyond engineering essentials. Emphasis will be placed on meeting the professional development and business needs of today and converting them into the building blocks of tomorrow's success.

- **Track 8: Renewable Energy Systems and Net Zero Buildings**

  ### Track Chair: Kevin Gallen

  Email: kevin@gallenengineering.com

  Wind, hydroelectric and solar are just a few of the alternative and/or renewable energy sources that are being used in HVAC design as we strive for Net-zero and high efficiency buildings. This track will address recent advances in alternative energy systems and equipment and new design strategies for achieving Net-zero buildings.

Las Vegas 2017 (January 28 – February 1, 2017)

Deadlines:
March 14, 2016 – Conference Paper Abstracts Due
April 18, 2016 – Technical Papers Due
June 6, 2016 – Conference Papers Due
August 8, 2016 – Seminar, Forum, and Workshop Proposals Due

- **Track 1: Fundamentals and Applications**

  Track Chair: Chuck Curlin

  Email: ccurlin@shultzeg.com

  Engineering fundamentals are the foundation to understanding modeling, design, construction and operation of HVAC&R applications. This track provides opportunities for papers and presentations on theories, models, designs and shared experiences for both theoretical and applied concepts.

- **Track 2: HVAC&R Systems and Equipment**

  Track Chair: Michael Collarin

  Email: Michael.Collarin@parsons.com

  Selection of equipment and design of systems is critical for effective HVAC&R operation, and for achieving building operators' goals. The papers and programs in this track will assist designers and building operators in the use of traditional, non-traditional and hybrid equipment and systems; with an emphasis on high performance, sustainable and LEED-certified buildings.

- **Track 3: Water-Energy Nexus**

  Track Chair: Gary C. Debes

  Email: gcdebes@verizon.net

  The interdependencies between our water and energy systems are clear and are becoming more prominent as development requires the use of more resources while over-use and climate change make some resources scarcer. On the macro level, water is used in all phases of energy production and electricity generation (including renewables); and energy is required to extract, convey and deliver water, and to treat wastewaters prior to their return to the environment. On the micro level, the water-energy nexus is a major consideration for the HVAC&R community in determining equipment and system selection and design as well as building operation. This track will present papers and programs highlighting recent research on this issue as well as technologies and designs intended to reduce the gap between energy and water efficiency.

- **Track 4: Commercial and Industrial IAQ**

  Track Chair: Kevin Marple

  Email: kmarple@benzco.com

  Indoor Air Quality is a vital consideration in the built environment. As people spend increasingly more time in industrial and commercial facilities, IAQ is closely linked to occupant comfort, satisfaction, productivity and health. This track will offer papers and programs to inform building owners and operators on the value of improving IAQ.

- **Track 5: Mission Critical Design and Operation**

  Track Chair: Carrie Anne Crawford

Email: carriecrawford@eeace.com

As societies become more dependent on mission critical facilities, the design and operation of these facilities has undergone rapid change. This track will present papers and programs which will highlight advances in technologies, controls, design and operation of mission critical facilities to meet their increasing loads while also minimizing their impact on energy/water usage.

- **Track 6: Effects of Climate Change on HVAC&R**

  Track Chair: Rocky Alazazi

  Email: mralazazi@yahoo.com

  Climate change will have an increasing effect on the design and operation of the built environment. How does the HVAC&R community design for buildings today that are intended to be highly functional and efficient well into a future where today's standards, codes and practices may not be sufficient to meet tomorrow's climatic conditions? This track seeks papers and programs that will inform the selection of strategies, designs and approaches that will increase building resilience and facilitate climate adaptation.

- **Track 7: Energy Efficient Industrial Buildings**

  Track Chair: Corey Metzger

  Email: corey.metzger@resourcece.com

  Industrial facilities often have different HVAC&R requirements than do commercial and institutional facilities. Oftentimes these are a result of the processes that occur within industrial facilities as well as the life safety issues these processes create. This track will present papers and programs that will inform how energy efficiency can be achieved without compromising life safety considerations.

- **Track 8: Building Operation and Performance**

  Track Chair: Cynthia Moreno

  Email: cindym@tmmechanical.com

  Modeling has become an essential factor in the design of all aspects of many buildings. Often the operational results of the building do not match the modeled outcome that the owner/operator expected. This can lead to much "finger pointing" or worse. This track will present papers and programs to update modelers, designers, contractors and owners/operators on how to better match building

To: Dan LaForgia
From: Steve Wise
Date: January 25, 2016
Subject: TC2.6 Publications Subcommittee Minutes – Orlando, January 2016

Attendees:	Asad Sardar	Pat Marks	Jack Wang
Joe Bridger	Joe Bridfer	Greg Meeuwsen	Roman Wowk
Dan LaForgia	Trevor Caldwell	Andrew Mitchell	Randy Zimmerman
Erik Miller-Klein	Curt Eichelberger	Karl Peterman	
Jason Swan	Jim Kline	Lauren Ronsse	
Chris Papadimos	Rob Lilkendy	Jeremy Stockmans	
AliaEldiMohamed	Jerry Lilly	Eric Sturm	
(voting members in red)			

Fundamentals Handbook, 2017 revision

The TC voted to approve final revisions to this chapter, which will be submitted next month. Few changes, mostly grammatical.

Application of Manufacturer Sound Data Guide

Sales to date of these books to date are: 1593 copies
We discussed whether a major change in format, content, etc. would have enough of a market to justify the effort, then agreed to just do a quick update.
The first step is a review of each current chapter by a couple of volunteers each.

Application of Manufacturers Data - UPDATE	Volunteers	
	Manufacturer	**Consultant**
Chapter 1,2,3 —Into/Basics	Jeremy Stockmans	Steve Wise
Chapter 4—Fan Noise Characteristics Tutorial	Dustin Meredith	Erik Miller-Klein
Chapter 5—Central-Station Air-Handling Units	Curt Eichelberger / Dustin Meredith	Chris Papadimos
Chapter 6—Commercial Packaged HVAC Equipment	Curt Eichelberger / Eric Sturm / Jeremy Stockmans	Chris Papadimos
Chapter 7—Silencers for HVAC Systems	Dan LaForgia / Andrew Mitchell	Jerry Lilly
Chapter 8—Roof Ventilators	Rad Ganesh / Pat Chinoda	John Murphy
Chapter 9—Panel-Type Propeller Exhaust Fans	Rad Ganesh / Pat Chinoda / Jack Wang	John Murphy
Chapter 10—Grilles, Registers, and Diffusers	Randy Zimmerman	Joe Bridger
Chapter 11—Air Terminals	Randy Zimmerman	Chris Papadimos
Chapter 12—Room Fan Coil Units	Randy Zimmerman	Chris Papadimos
Chapter 13—Centrifugal Water Pumps	**?**	John Dunlap / Jerry Lilly
Chapter 14—Air-Cooled Chillers / CondensERs	Pat Marks / Jack Wang	Jerry Lilly
Chapter 15—Water-Cooled Chillers	Pat Marks / Jack Wang	Jerry Lilly
Chapter 16—Cooling Towers	Erik Miller-Klein	SPX ?
Chapter 17 - Overview of HVAC Test Procedures	Pat Marks / Curt Eichelberger	
Other New Topics?		
NEEDS AN INDEX !	Steve Wise	
Chilled Beams	Karl Peterman	
Generators	Robert Simmons	Jerry Lilly
Transformers	Roman Wowk	
VRF / Split Systems	Pat Marks	Jerry Lilly

Applications Handbook

We had a request through ASHRAE to consider a change in Table 47 of the recommended isolators for screw chillers. Some manufacturers strongly suggest only pads, and not springs, be used.

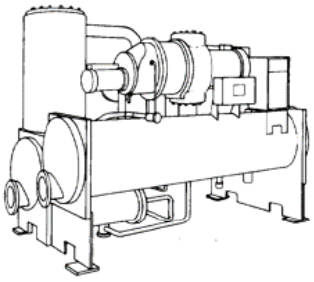
Reggie Keith, Karl Peterman, Jack Wang, Jerry Lilly, Pat Marks and Chris Papadimos have agreed to decide if we eliminate the current table recommendation of springs, or just add cautions.

ON-LINE VERSION REFORMAT

A. A desirable on-line format will probably have a different view-screen aspect ratio than the portrait/letter/2-column configuration of the print version. Also we would want to embed audio files, spreadsheets, etc. and have click-by-click convenience.
B. Could this expanded chapter include stuff from other publications like the Ebbing/Blazier book and serve as i) a self-contained reference, and ii) an updatable reference.?
C. How do we administer updates?
D. What format?
E. Will ASHRAE support the concept?
F. Should we show more algorithms?

TO-DO: A volunteer group (*Steve Wise, Reggie Keith, Jack Wang, Mike Schwob, Robert Simmons, Trevor Caldwell, Joe Bridger, Ahmed Alaa Eldin Mohamed, Don Warick, Ashish Tripathi)* will continue work, to update a concept like shown below.

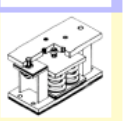
Water Cooled Chiller
Vibration Isolation



General

1. Electrical conduit connections should be flexible.
2. Chilled and condenser water pipe connections should be made with flexible elastomeric connectors mounted directly to the chiller connectors.
3. The refrigerant vent discharge connection should be made with a stainless steel braided flexible hose per the manufacturer's instructions.

Isolator Types

Type 1 Rubber Pads	
Type 2 Rubber Mounts	
Type 3 Spring Isolators	
Type 4 Restrained Spring Isolators	

Vibration Isolation Selection Guide

Reciprocating

Equip. Location	Base Type	Iso. Type	Min. Defl.
Slab on Grade	A	2	0.25 in
Up to 20 ft Floor Span	A	4	0.75 in
20 to 30 ft Floor Span	A	3	1.75 in
30 to 40 ft Floor Span	A	4	2.50 in

Centrifugal and Screw

Equip. Location	Base Type	Iso. Type	Min. Defl.
Slab on Grade	A	1	0.25 in
Up to 20 ft Floor Span	A	4	0.75 in
20 to 30 ft Floor Span	A	3	1.75 in
30 to 40 ft Floor Span	A	3	1.75 in

Open Centrifugal

Equip. Location	Base Type	Iso. Type	Min. Defl.
Slab on Grade	A	1	0.25 in
Up to 20 ft Floor Span	C	4	0.75 in
20 to 30 ft Floor Span	C	3	1.75 in
30 to 40 ft Floor Span	C	3	1.75 in

Absorption

Equip. Location	Base Type	Iso. Type	Min. Defl.
Slab on Grade	A	1	0.25 in
Up to 20 ft Floor Span	A	4	0.75 in
20 to 30 ft Floor Span	A	3	1.75 in
30 to 40 ft Floor Span	A	3	1.75 in

Base Types

Type A	Direct Isolation is used when equipment is unitary and rigid and does not require additional support. If there is any doubt that the equipment can be supported directly on isolators, use a structural base (Type B) or consult the equipment manufacturer.
Type B	Structural Bases are used where equipment cannot be supported at individual locations and/or where means is necessary to maintain alignment of component parts in equipment.
Type C	Concrete Bases consist of a steel pouring form usually with welded-in reinforcing bars, provision for equipment hold down, and isolator brackets. Concrete bases should have a depth equal to one tenth the longest span between isolators, with a minimum of 6 inches. The base depth need not exceed 12 inches unless it is specifically required for mass, rigidity, or component alignment.

Algorithms –

Greg Miller led a discussion in a separate "Hot Topic" session.

Summary of important considerations:

1. Decide if ASHRAE should sell software……..or, offer some kind of support files.
2. Or, should we just update the 1991 publication.
3. Or, should we migrate algorithms into the Handbook.

It was noted that not just the document but also the Doug Reynolds software from 1991 is available as a start.

Webmaster Report – 2016 Orlando

Submitted by Michael Schwob

The following pages have been updated:

- Research
- Meetings
- Member Roster
- Past Programs

The following posts have been added:

- Orlando Meeting Schedule
- Orlando Meeting Agenda
- Orlando Vibration Isolation Subcommittee Meeting Agenda

The website has be the victim of a number of attempted hacks. In the last recording period (1/5/2016 to 1/19/2016) 1,392 attacks were blocked. The top three countries that are the sources of the attacks are Russia (87%), Brazil (5%) and Ukraine (4%). No hacks have succeeded yet.

ASHRAE has updated their hosted TC websites. The new websites look and work much better. When they created our website, they ported much of the content from our website hosted by Lily Wang. I participated in a webinar to learn about the website.

ASHRAE website https://tc0206.ashraetcs.org/ Ours is http://ashrae-tc26.org/

I found that I could not write HTML code for the ASHRAE hosted website and that they do not have the facility to create tables. Most of our content is tabular in nature. This as a major lapse in the design of the website environment. I sent an email to Joslyn Ratcliff (Manager - Electronic Communications & Applications) on 12/27/2015 about this issue and have not received a reply.

I have not updated the information on the ASHRAE hosted site.

Members and guests of TC 2.6 vibration isolation subcommittee,

Below is the agenda and meeting notes for the subcommittee meeting:

1. Invited presentation on "Transformers in the Built Environment" by Ms. Felicia Doggett, Principal consultant and founder, Metropolitan Acoustics.

   Note: The presentation was conducted thru Skype as Felicia's flight had been cancelled due to snow storm (all Philadelphia flights were cancelled Saturday). The presentation was well attended –about 35 attendees. Felicia presented 3 transformer cases, described the problems, detailed of changes, and the effect and cost of final solutions. Good Q&A at the end of the presentation.

   After the meeting, Chris Papadimos graciously agreed to present some transformer vibration isolation and noise cases with the committee in a future meeting, tentatively St. Louise meeting.

2. Invited presentation on "ASTM E477-13e1: Standard Test Method for Laboratory Measurements of Acoustical and Airflow Performance of Duct Liner Materials and Prefabricated Silencers" by Mr. Andrew Mitchell, Noise Control Product Manager, Pottorff.

   Note: Silencer function in an acoustics duct system, is analogous to isolator function in a structure. The silencer insertion loss standard is similar to what we would like to drive to for isolator dynamics performance. Andrew presented detail test setups, silenser test locations, outputs, and answered several questions.

3. Discuss the Inquiry from Stephen W. Duda, ASHRAE Fellow, on a major screw chiller equipment manufacturer recommending against spring isolators on screw chillers – which is a direct contradiction of the advice given on Page 48.45 of the 2015 ASHRAE Handbook. Leaders: Steve Wise and Jack

   Note: Discussed in publication subcommittee meeting.
   A lot of discussion on how to better improve the clarity of potential issue when using spring type isolators on screw chillers. No consensus as there are also diverse opinions on how to improve Table 47 of Chapter 48 (next item). Jack will propose update for improving the clarity of applying spring isolators on screw chillers.

4. Discuss an example and general template to rewrite the vibration isolation selection based on type of equipment – Table 47 of Chapter 48 in

ASHRAE Handbook. Leaders: Michael Schwob, Reginald Keith, Steve Wise, and Jack

Note: Discussed in publication subcommittee meeting.
A lot of discussion on how to improve Table 47 of Chapter 48. Some consultants like current format, and some would like total revision, and the other consultants don't use it. The consensus is that nobody knows what the basis of the table is from. This topic will be discussed in future meetings. If anybody has suggestion on how to better improve Table 47, please contact me.

5. WS1754: "Developing the Standard Test Method for Dynamic Characteristics of Vibration Isolators". Leader: Jack

   Note: Discussed in research subcommittee meeting.
   RTAR had been conditionally approved in 2015 winter conference. RAC agreed to proceed with drafting work statement. The deadline for submitting the WS is Dec. 15, 2016. Estimate 1 month review for RAC, and 1 month review Note: Discussed in publication subcommittee meeting.
   A lot of discussion on how to improve Table 47 of Chapter 48. Some consultants like current format, and some would like total revision members.

Item 3&4 were discussed in Publication subcommittee (1/24 3:10-4 PM, Lake Down B) and Item 5 was discussed in Research subcommittee (1/25 10-11 AM, Lake Eola A).

At the end of vibration isolation subcommittee meeting, Dr. Ahmed Alaa Eldin Mohamed, of ASHRAE Falcon chapter, UAE approaches me and expressed interest in presenting his isolator applications.

ASHRAE TC 2.6

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RP-1408 Meeting Minutes from Orlando 2016

The Effect of Lining Length on the Insertion Loss of Acoustical Duct Liner in Sheet Metal Ductwork

Principle Investigator: UNLV (Doug Reynolds)

PMS Members Present: Jerry Lilly (chair), Curt Eichelberger, Rob Lilkendey

PMS Members Absent: Mark Schaffer, J.R. Babineau, Rich Peppin, Kim Osborne, Karl Peterman

The meeting was held at 10 AM on January 24, 2016. The meeting was open to all interested parties, with a total attendance of approximately 20 members of TC2.6. Jerry Lilly opened the meeting giving a brief history of this research project, which began in 2008. At present, all of the straight rectangular and round ducts have been tested, either by Price Industries or UNLV, with some of the rectangular ducts tested by both laboratories. In general, there was good agreement between the results of the two labs, especially in the mid-frequency region where the duct lining is most effective. One of the most interesting and surprising results of this project is the excellent acoustical performance of fiberglass duct liner with a foil facing at frequencies below 1,000 Hz. The Principle Investigator distributed a draft final report to the PMS three days prior to the meeting. This report presented test results only for the fiberglass duct liner materials. The PMS will be reviewing the report and providing comments to the Principle Investigator over the next month. An updated draft report will be expected for review in two months. A request for another no cost extension to July 31, 2016 was approved by TC2.6 in the main meeting held on January 25, 2016.

1. Insertion loss testing is completed for all round ducts up to 36” diameter, lengths to 10 ft.
2. A total of 27 test specimens have been completed to date out of a total of 263 scheduled.
3. The 42” and 48” round ducts will be tested next before going to the 20 ft. long sections
4. Doug will start measuring humidity for future tests
5. Doug will present all data in 1/3-octave bands
6. All round ducts will be done by June 2013
7. First vibration & intensity measurements will be on 20’ long 24” diameter ducts this June
8. New project completion date is June 2014