

TC 6.3 Meeting Minutes

January 21, 2014

Dianne Griffiths

- Roster Discussion -Douglas
 - New roster will be effective in July
 - Chair Jonathan Douglas is rolling off and Vice Chair Diane Jakobs is the incoming Chair
 - Request that members update their bio on the ASHRAE website
 - Bert Phillips, Larry Brand, and Mark Olsen will roll on as members after the Summer meeting
 - Bert agreed to take on Secretary role because Dianne Griffiths has not been able to attend meetings consistently
 - Chris Li requested to become a corresponding member

- 2016 ASHRAE HVAC Systems and Equipment Handbook - Gaston
 - Chapters 10 and 33 are due on 6/13/15
 - Diane Jakobs made extensive revisions to Chapter 33 Furnaces to reflect current technology and issues such as air leakage and electrical consumption. THANKS!
 - Jon Proctor requested Word versions of each chapter and agreed to review.
 - Mark Olsen agreed to fine someone to review Chapter 10 Small Forced-Air Heating and Cooling Systems
 - Mike Lubliner will forward NEEA comments
 - Suggestion made to review chapters more thoroughly at the summer meeting; project onto a screen
 - Will need to vote at Chicago on final revisions of Chapters.

- Programs - Mercer
 - Discussed 11th hour rejection of Doug Kosar's paper. He intends to move forward with having the material published as an ASHRAE Journal article in late Spring/early Summer.
 - Discussed high rejection rate of proposed sessions. Key is to link to the program themes.
 - Discussed the new Workshop format.
 - Doug Kosar suggested a session on utilizing ERVs. Point/Counterpoint **workshop for Chicago**.
 - Residential zoning . Shoot for a **Conference Paper session at Chicago** with a broader scope to bring in other papers.
 - John Proctor will draft a technical paper on zoning studies (prefers to have something published.
 - Other papers – Roy Crawford, Jim Braun, IBACOS register locations, Roderick ORNL
 - Dave Springer requested co-sponsorship for a TC 2.1 sponsored seminar (Attached)

- Research - Lubliner
 - Ideas
 - Comparison of test conditions to real world. There is a commercial equipment project (RP 1608 packaged rooftop units). Propose similar RTAR for residential

equipment or let the rooftop guys move forward. Agreed to discuss it during the call with workshop speakers.

- Maybe some research needed to support revisions to Standard 193; Iain Walker has found issues with implementation in the field. Lessons learned.
- What is the optimal (lowest LCC) static pressure to design duct systems to. AHRI/ARTI funding research.
- HVAC for hot/dry climates. Might be useful for development of regional standards.
- Are Std. 103 cycle times still valid? Diane Jakobs and Larry Brand agreed to write an RTAR.

- Standard Status

- Standard 193 – Will be up for revision or reaffirmation soon. Has an addendum to correct an error in a formula. CEC has references it in their air tightness standards. Manufacturers present at meeting noted that it is impacting their designs.
- Standard 103
 - All 3 working groups have more work to do but are making good progress.
 - Editorial change working group
 - Substantive working group
 - SI unit working group
 - Report provided by email from Paul Haydock, Chair SPC 103:
The SPC met on Sunday (Jan 19). The SPC has three working groups to address editorial revisions, substantive revisions and SI Units changes. The SPC reviewed and acted on 8 editorial, and 6 substantive issues. Remaining are 11 editorial revisions including the SI Units revisions, and 2 to 4 substantive revisions.

The biggest change to the standard is likely to be the SI units. In the past, the standard was not required to provide SI units because of the uniquely US oriented standard. However, ASHRAE has requested that we do the translation in this go around.

In the SPC103 Work Plan, we will finalized the first draft of the revision after the June 2014 meeting. Public Review approval is planned for January 2015, with vote for publication in June 2015.

New Business

Considered moving meeting to another time to avoid conflict with 90.2 meeting. Roy Crawford and Mike Lubliner both participating in 90.2. No good alternative time so need to find a Research Chair to replace Mike.

Attendance

Name	End Year	Position	Present
Mr Jonathan D Douglas	06/30/2014	Chair	X

Dr Diane M Jakobs, PhD	06/30/2016	Vice Chair	X
Ms Dianne M Griffiths, PE	06/30/2016	Secretary	X
Mr Michael R Lubliner	06/30/2014	Research Subcommittee Chair	X
Mr Kevin Mercer	6/30/2017	Program Subcommittee Chair	X
Dr Charles A Gaston, PE	06/30/2016	Handbook Subcommittee Chair	X
Mr James B Cummings	06/30/2017	Member	
Ms Judith D Jennings, PE	06/30/2016	Member	
Mr Bryan K Rocky	06/30/2016	Member	
Dr Bo Shen, PhD	06/30/2016	Member	
Mr George A Yaeger, PE	06/30/2014	Member	X
Non-Voting			
Dr Iain S Walker		Standards Subcommittee Chair	
Mark Olsen		Webmaster	X
Steve Hancock		Research Liaison	
Roderick Jackson			X
Byron Horak			X
Anuj Mistry			X
David Springer			X
John Proctor			X
Larry Brand			X
Chris Li			X
Kashif Nawaz			X
Doug Kosar			X
John Hamilton			X
Bert Phillips			X
Umair Surani			X
Rusty Tharp			X
Darryl DeAngelis			X
Jon Winkler			X

Proposal for ASHRAE seminar submission

Title:

Cooling Potential with Increased Night Ventilation in Low Energy Buildings

Overview:

In post-occupancy studies of low energy buildings elevated temperature levels is a commonly reported problem. Ventilative cooling can be an attractive and energy efficient solution to reduce peak load and energy use in new and existing residential buildings. Equipment required for ventilative cooling in residential buildings is available and has been shown to be cost-effective in many climates. The seminar will present the concept of ventilative cooling together with studies of the potential impact on energy consumption and indoor environment in different climatic regions.

Learning Objectives:

1. The audience will learn the concept of passive cooling with night ventilative and climates where it is appropriate to implement as either a complete comfort solution, or to reduce cooling load.
2. The audience will learn to what extent indoor temperatures must vary to achieve energy and demand savings, and resulting potential thermal comfort impacts.
3. The audience will learn the benefits of utilizing ventilative cooling for partially meeting fresh air ventilation requirements.
4. The audience will learn what general system types are available for use in ventilative cooling.
5. The audience will learn to evaluate the cooling potential based on weather data
6. The audience will learn how to design and control ventilative night cooling

Technical Committee:

- 2.1 Physiology & Human Environment
- 4.3 Ventilative Requirements & Infiltration

Expected Attendance:

55

Program Track:

3. Indoor Environmental Health/Indoor Environmental Quality

Program Level:

Advanced

Program Type:

Seminar

Length:

90 minutes (3 presenters)

Special Request or Comment:

Methods of Assessment:

Q1: Why do high performance homes benefit more from night ventilative cooling?

A1: They do not cool sufficiently during the night (or other cool periods) because of their high insulation levels and air tightness, and because heat buildup due to internal loads and solar gain cannot be rejected as fast as in leakier, under-insulated homes.

Q2: What are three benefits of ventilative cooling?

A2: (1) Higher effective EER's than high performance air conditioning systems, (2) Improved indoor air quality, (3) reduced peak load.

Q3: What are the advantages of central fan systems that integrate with heating & cooling systems?

A3: They operate automatically, they do not require that windows be opened thereby reducing security risks, and they filter outside air.

Q4: What are the problems with central fan systems?

A4: The airflow required for ventilative cooling may exceed what is required for air conditioning, necessitating larger ducting and low pressure drop coils.

Q5: What are the advantages and disadvantages of using natural ventilation for night cooling??

A5: There is no fan energy penalty but windows or vents must be operated, airflow and cooling effectiveness is reduced, outdoor noise, security, and intrusion of particulates such as pollen and dust can be an issue.

Q6: What is the most effective use of ventilative cooling in commercial buildings?

A6: Removing heat accumulated during the previous day to reduce morning cooling loads, and economizer operation during occupied periods to reduce daytime energy use during mild weather.

Q7: How does climate affect the use of ventilative cooling?

A7: Diurnal temperature swings must be sufficient to provide efficient cooling (at least 20°F), and the enthalpy of outside air should not be higher than that of indoor air under most conditions.

Q8: How does the temperature difference between outside and inside influence the needed air flow for ventilative cooling?

A8: Use large flow rate at small temperature differences and small flow rates at very low outside temperatures.

Q9: What type of ventilation concepts/systems are needed for ventilative cooling?

A9: Most type of ventilation concepts/systems like balanced mechanical systems, exhaust systems, natural ventilation systems or any combination.

Q10: How important is the identification of method and tools for predicting cooling need?

A10: Prediction on evaluating and eliminating the cooling need and the risk of overheating is becoming one issue together with health in low energy buildings.

Chair : Max H. Sherman

Lawrence Berkeley National Laboratory
 Berkeley, California
 Email: MHSherman@lbl.gov
Member Grade(s): Fellow

Presentations:

Contact Presenter	Presentation-Title	Speakers Name, affiliation
ph@civil.aau.dk	Ventilative Cooling Needs and Outdoor Night Cooling Potential	Per K. Heiselberg, Prof. Aalborg University, Denmark
asi@byg.dtu.dk	Evaluation of different concepts for ventilative night cooling by building simulations	Angela Simone, Ph.D., Member, ICIEE, Technical University of Denmark, Denmark
springer@davisenergy.com	Residential Ventilative Cooling Technology Status and Applications	David Springer Principal Davis Energy Group 530.753.1100 x26 www.davisenergy.com

Speakers	Presentation-Abstract
Per Heiselberg	The basic concept of ventilative cooling by night-time ventilation involves cooling the building structure overnight in order to provide a heat sink during the occupancy period. To assure thermal comfort two criteria need to be satisfied, i.e. (i) thermal capacity of the building needs to be sufficient to accumulate the daily heat

	<p>gains within an acceptable temperature variation and (ii) climatic cooling potential and the effective air flow rate need to be sufficient to discharge stored heat during night.</p> <p>A method for estimation of the ventilative cooling potential by night-time ventilation during early stage of design will be presented.</p>
<p>Angela Simone</p>	<p>The free cooling potential of outdoor air during nighttime was evaluated with regards to thermal comfort, indoor air quality, occupant use, and reduction of cooling energy needs through dynamic building simulations.</p> <p>The study, on indoor environmental conditions in European climatic zones for a near Zero Energy Buildings, show that increased nighttime ventilation can avoid overheating at almost no additional energy cost. Besides, the lowering of indoor temperature at night time may provide an additional cooling due to an increased indoor air velocity. Night cross natural ventilation combined with a mechanical ventilation system with heat recovery showed an optimal combination.</p>
<p>David Springer</p>	<p>Ventilative cooling has been shown through simulations and field monitoring to yield significant energy savings and demand reduction in western climates, and can replace air conditioning in high performance homes located in milder climates. Effective January 2014 ventilative cooling is covered under California's Title 24 energy standards. The development of this technology will be traced from its beginnings with the Alternatives to Compressor Cooling project in the 1990's to its current commercialization status.</p>