



ASHRAE Technical Committee 5.6

ASHRAE TC5.6 Control of Fire and Smoke Draft Meeting Minutes Chicago Meeting January 2015

These draft minutes have not been approved and are not the official, approved record until approved by this committee.

TC/TG/TRG No. TC5.6

TC/TG/TRG/TITLE: Control of Fire and Smoke

LOCATION: Chicago, IL

VOTING MEMBERS PRESENT	VOTING MEMBERS ABSENT	Ex-MEMBERS and ADDITIONAL ATTENDANCE
Peter McDonnell	Gary Andis	Kate McFarland
David John	Gerald Kettler	Tim Orris
Valentina Hadelcu		Ray Sinclair
Josiah Wiley		Ed Koop
Ahmed Kashef		John Klote
Paul Turnbull		Byron Hagan
Matt Davy		Marty Gissel
Kevin Cheng Chang		John Greene
William Black		Yuan Li
Bob Sibilski		John Clark
Jim Buckley		Branden Butella
		Tony Moskalik
		Yoon Ko
		Geroge Hadjisophocleous
		Curit Peters
		Marc Sorge
		Rick Larson
		Mark Belke
		Ivo Chromy
		Julian Rochester
		Stoil Pamoukov
		Ezus Fanis

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The Committee Vice-Chair Peter McDonnell called the meeting to order

Identification of Voting Members

Chairman's Remarks – Ahmed Kashef

- Discussed availability of ASHRAE resources for phone conference calls and Web Meetings between regular scheduled meetings.
- Welcomed new committee members and guests.
- ASHRAE request everyone to keep their online bio's updated on ASHRAE web site.
- ASHRAE request everyone should be careful with speaker evaluations. These are reviewed by ASHRAE. If the evaluation is lower than 3.5 – ASHRAE may require the speaker to complete some presentation training before presenting again at ASHRAE



PROGRAMS – Valentina Nedelcu

Current Meeting Programs.

Seminar 35: Alternative Fire and Smoke Detection Technologies for Smoke Control Applications

Tuesday, 8:00AM-9:30PM, Crystal Room

Sponsor: TC 5.6

Chair: Paul Turnbull

1. Comparative Testing of Various Detection Technologies. Matthew Davy
2. Video Image Fire and Smoke Detection for Large Spaces with High Ceilings. George Hadjisophocleous
3. Performance of Detection Systems in Tunnels. Ahmed Kashef

Seminar 15: Computational Analysis for Fire-Life Safety

Sunday, 1:30PM- 3:00PM, Honoree Ballroom(Lobby)

Sponsor: TC5.9, TC 5.6

1. Numerical Modeling of Design Fire Scenario Verified By Small-Scale Tests.
2. Fire Tenability and Tunnel Surface Heat Exposure Analysis for the Ohio River Bridge Tunnel.
3. Use of Pedestrian Modeling Software in Emergency Response Planning.

Technical Paper Session 5: Thermal Comfort in a Conservation Society.

Monday, 8:00AM- 9:30PM, Chicago Room

1. A Database of Static Clothing Thermal Insulation and Vapor Permeability Values of Non-western Ensembles for Use in ASHRAE Standard 55, ISO 7730 and 9920: Results from Project 1504-RP.
2. Stairwell Pressurization and the Movement of Smoke during a High-Rise Fire (CH-15-019). William Black
3. Energy Savings and Thermal Comfort Optimization in Office Cubicle Environment (CH-15-020)
4. Economizer Performance and Verification: The Effect of Human Behavior on Economizer Efficiency and Thermal

Comfort in Southern California (CH-15-021)



PROGRAMS – Valentina Nedelcu (Cont).

5. Future Conference meetings schedule update:

Winter	Annual
Jan 24-28, 2015 - Chicago, IL	Jun 27-July 1, 2015 - Atlanta, GA
Jan 23-27, 2016 - Orlando, FL	Jun 25-29, 2016 - St. Louis, MO
Jan 28 - Feb 1, 2017 - Las Vegas	Jun 24-28, 2017 - Long Beach, CA

Atlanta 2015 Annual Conference.

www.ashrae.org/atlanta

Atlanta Conference Tracks

Track 1 HVAC&R Systems and Equipment

Track 2 HVAC&R Fundamentals and Applications

Track 3 Research Summit

Track 4 Refrigeration

Track 5 Building Operations, Maintenance, and Optimization/ Commissioning

Track 6 Indoor Air Quality

Track 7 Modeling throughout the Building Life Cycle

Track 8 High Performance Buildings

Track 9 Moving Advanced Energy Design Guidance to the Mainstream

September 22, 2014 – Conference Paper abstracts and complete Technical Papers due

January 5, 2015– Final Conference Papers due. Website opens for seminar, forum and workshop proposals.

February 9, 2015- Seminar, Forum and Workshop proposals due.

February 13, 2015- Revised Conference Papers/Final Technical Papers due.

March 2, 2015- Conference Paper accept/ reject notifications

March 23, 2015- Seminar, Forum and Workshop accept/ reject notifications

May 4, 2015- Confex opens for uploads



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PROGRAMS – Valentina Nedelcu (cont).

June 5, 2015- All presentations due

June 22, 2015- Deadline for submitting presentation revisions.

132 conference paper abstracts were submitted.

Orlando2016 Winter Conference.

www.ashrae.org/orlando

March 23, 2015 - Conference Paper abstracts.

April 6, 2015 - Acceptance notifications due.

April 20, 2015 - Technical Papers are due.

July 6, 2015 - Conference papers due.

Aug 10, 2015 - Seminar, Forum and Workshop proposals are due.

6. CEC updates.

TC Opportunities:

Suggestions for tracks welcomed, group of sessions that can be used as mini-tracks, putting together an entire track in cooperation with other TC's

Presentations:

Presentations must be uploaded for commercialism before the deadline (June 5 for Atlanta).

Uploads need to be substantially complete including the AIA disclaimer and Learning Objectives

7. Future Proposed Programs.

During the Program Sub-Committee Meeting each of the scheduled/proposed TC5.6 program events was re-visited in terms of: event type, proposed meeting date, topics, chair and speaker availability.



PROGRAMS – Valentina Nedelcu (cont).

Atlanta, June 2015:

No proposed programs.

Orlando, January 2016:

- **Technical Papers:**

Make-up Air Velocity for Smoke Control in Atria. University of Maryland RP-1600 final results.

Full Scale experiments to study the impact of the make-up air in atrium conditions.

George Hadjisofocleous

April 20, 2015 – Technical Papers are due

- **Conference** : CFD of Smoke Management

Chair: Paul Turnbull

John Klote- Atria Tenability Analysis for Smoke Control System.

More speakers are needed. John Klote will contact (Mike Ferrara and Kevin McGrath) and see if they are interested on presenting papers on this topic.

March 23 2015- Conference Paper Abstracts.

- **Conference** - Smoke Control in Secure Facilities.

Collaboration with TC 9.4 Justice Facilities.

Peter McDonnell is the liaison with TC 9.4

Possibility of 4 papers.

If the papers don't make the deadline the program will be submitted as a seminar for Orlando.

St- Louis, June 2016:

- **Conference**- Pressure Testing of the Buildings. Experiments.

Chair: Leon Wang

Possible papers by NRC (Experiments, Test Data), Mike Ferrara and Leon Wang



PROGRAMS – Valentina Nedelcu (cont).

Las Vegas, January 2017:

- **Conference-** Smoke Control Technologies.

The program to include Natural Smoke Control Strategies topic that was previously proposed. Various case studies and designs implemented in other parts of the globe. A number of possible speaker with interest on this topic were mentioned: Bill Webb, Frank Mills, Mike Ferrara, Ray Sinclair, John Klote.

- **Seminar**– Special issues related to smoke control in large volume spaces.
Jeff Tubbs - Moderator.
Yoon Ko (NRC) - Smoke Control in Tunnels.
John Klote- Smoke control in Long Spaces.CFD capabilities/ limitations.
John Clark- Smoke removal in Shopping Malls. Case studies, where was needed.

Other Proposed Programs:

Future program topics.

Zone Smoke Control required in hospitals. It was proposed to be removed as is not a topic of interest anymore.



TC5.6 Research activities – Paul Turnbull

Active Research Projects:

RP-1600 Make-up Air Velocity for Smoke Control in Atria (#2)

- Project is to further investigate the effects of make-up air in excess of 200 fpm on performance of an atrium smoke exhaust system.
- Research is being done by University of MD.
- Work has been completed.
- Draft of final report was received Oct. 24, 2014.
- PMS (Paul Turnbull, John Klote, Peter McDonnell) reviewed report and developed comments.
- Discussed comments with UMD (Milke, Trouve, Pongratz) via conference call Dec 3, 2014, and forwarded written comments.
- Revised report was received Jan 20, 2015 and has been distributed to PMS.
- PMS still needs to review the paper to see if comments were adequately addressed.
- Summary of findings:
 - Overall, the findings were that if makeup air is injected at or below the flame height, velocities up to 1.75 m/s (350 fpm) can be safely used.
 - The plume is affected but not destroyed.
 - Increased smoke production can be predicted from 6 parameters (area of fire, area of vent, velocity of makeup air, Heat Release Rate of fire, elevation of top and bottom of makeup air vent).
 - This increase in smoke production can be dealt with in system design by increasing exhaust to remove additional smoke.
 - Separation distance is also affected (reduced) as a result of makeup airflow.
 - Change in separation distance can be predicted using same 6 parameters.

TRP-1447: (Performance of Pressurized Stairwells with Open Doors)

- Project is to investigate the need for compensating stairwell pressurization systems, to further investigate observations seen in RP-1203 (modeling study of stairwell pressurization systems).
- Work is being done by National Research Council of Canada.
- Yoon Ko reported on the progress of the project.
 - Experiments ongoing in 10-story test facility
 - Planned test scenarios are intended to evaluate the performance of open doors in exit stairs with/without pressure compensation
 - 10 test scenarios planned, including 2 fire scenarios, duration 30 minutes
 - All walls / doors sealed. Leakage provided through controlled openings.
 - Pressure monitored at every stairwell door
 - 1 test complete, 9 pending.
 - Plan for remainder of project is:
 - Complete testing by March.
 - Perform tenability analysis Mar-May 2015
 - Draft of final report to PMS by Sept 2015.



TC5.6 Research activities – Paul Turnbull (cont)

RTAR 1644 (Smoke Control in Long Atria):

- This RTAR has gone through many revisions. It was submitted to ASHRAE in 2011, and rejected. Main comments from RAC:
 - Lacks details about deliverables
 - Please address budget concerns
 - Unclear how data would be used by ASHRAE
- RTAR was written to include full-scale or scale-model testing and CFD modeling. Cost estimate in the RTAR is \$150K. Past projects suggest this is too low for full-scale testing, which agrees with RAC concerns.
- During the Research Subcommittee meeting, the discussion included the following points:
 - If modeling is used, small scale modeling would have to be used to meet the cost constraints.
 - There are concerns that scale modeling may not address heat transfer well, and that is the main issue to be investigated. Half or full scale testing would be needed to address heat transfer, but would probably exceed the budget.
 - CFD could be used if particular attention was paid to heat transfer, which is not normally done in atrium smoke control evaluation, but is possible.
- Follow up discussions suggested:
 - The best course of action is to rewrite this RTAR as an investigation into the maximum length for smoke zones, without including any mention of validating a model.
 - If the RTAR is written assuming a CFD analysis, it should probably specify what parameters should be included in CFD test. Ray had many ideas about what should be included.
 - The goal is to develop recommendations for the maximum horizontal distance that smoke should be allowed to travel, based on this research data.
 - The RTAR should specify that multiple aspect ratios should be investigated.
 - The maximum distance might be a single number, or it may be a function of atrium height and width.
 - The outcome of this investigation (maximum distance) could be added to codes and standards with an exception stating "unless justified by engineering evaluation". The research results should also include a list of recommendations for what should be included in the engineering evaluation. This information could be included in the Annex material of the standard.
- Paul Turnbull will revise the RTAR per the discussion.
- John Klote and Ray Sinclair volunteered to review the revised RTAR.

Other

Section 5 has a new Research Liaison. David John will be new liaison for section 5.