

**ASHRAE Technical Committee 2.9
Ultraviolet Air and Surface Treatment
Main Committee Meeting Minutes**

**Monday, Jan 31, 2011
10:00AM - Noon
Las Vegas, Nevada
Las Vegas Convention Center, Room: N211**

These FINAL minutes were approved by the Technical Committee during the 2011 Montreal Annual Conference

“TC2.9 Scope – TC2.9 is concerned with all aspects of equipment and systems that utilize ultraviolet radiation to destroy or de-activate chemical and/or biological air and surface contaminants in HVAC systems and indoor spaces, including, but not limited to, effectiveness, safety, maintenance, and economics.”

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- Steve Martin, Chair, called the meeting to order at 10:10 AM. Participants introduced themselves and an attendance sheet was circulated.

Attendance

Voting Members	
Name	Present
Steve Martin, Chair	X
John Putnam	X
Jim Freihaut	
David Marciniak	
Jaak Geboers [‡]	X
Derald Welles	
Sam Guzman	X
Stuart Engel	X
Karin Foarde	X
Richard Vincent	
Dean Saputa	X
Eugene Faris	X
David Witham	X
Katja Auer, Vice-Chair*	X
Forrest Fencel*	X

Corresponding Members	
Name	Present
William Bahnfleth	
Peter Bjorkman	
Morton Blatt	
James Bolton	
Gregg Burnett	
Bob Coleman	X
Robert Culbert	
David Dubiel	
Chuck Dunn	
Christopher Flaherty	
Charles Gullede	
Steven Guzorek	
Brian Hafendorfer	
Byron Hagan	X
Mark Hernandez	
Paul Jensen	
Daniel Jones	
Thomas Justice	
Wladyslaw Kowalski	

[‡]International member, excluded from quorum requirement

Total Voting Members: 15 (actual 13)

*Abstain from Voting: Katja Auer & Forrest Fencel

Rick Larson	X
Josephine Lau	X
C. S. Lee	
Gary Luepke	
Matt Middlebrooks	X
Brian Monk	
Michael Morby	
Joanie Rodieck	
Scott Sherwood	

Larry Simmon	
David Sliney	
Greg Sproule	X
Meredith Stines	
Christine Sun	
Brandon Wellington	
Christopher Willette	X
Timothy Wilson	
David Witham	X

Guests
Joseph Firrantello
Jing Jin
Mary Clancy
Kyung-Ju Choi
Ashish Mathur
Uri Rainisch
Bob Scheir
John Andros
Brian Rodgers
Mark Hinkelman
Brad Stanley
Rupert Alfiler
Jason DeGraw
Adam Bare
Jeff Roseberry
Francis Gallo

9 of 13 Voting Members present (1 International Member – excluded from Quorum requirement; 2 Members Abstained) – **Quorum Achieved**
8 of 37 Corresponding Members present
16 Guests present
35 Total Attendees present

- Steve Martin distributed copies of the minutes from the Albuquerque, New Mexico Jun 2010 ASHRAE Summer meeting. No changes were noted.
- David Witham made a motion to approve the meeting minutes from New Mexico. Motion seconded by Stuart Engel. **Voting on approval of the Albuquerque meeting minutes was as follows: 9/0/2/2/13 (for/against/abstain/absent/total). Albuquerque meeting minutes were approved.**
- Steve Martin thanked John Putnam, the outgoing Chair of the TC2.9 for a great job done.
- Chairs Breakfast Report:
 - ASHRAE will discontinue using themes for conference after Montreal.

- We were reminded that TC and their subcommittees can use WebEx for conference calls, which are paid for by ASHRAE – it is encouraged that ASHRAE members use this service.
- Website update – Rick Larson – no new issues / action items to report
- Steve Martin made a motion to nominate Stuart Engel as TC2.9 Secretary starting in Jun 2011. Motion seconded by Katja Auer. **Voting on approval of Stewart Engel to Secretary was as follows: 9/0/2/2/13 (for/against/abstain/absent/total). Stewart Engel as new Secretary of TC2.9 was approved.**

TC2.9 Membership Subcommittee Report

TC2.9 decided that it is necessary to have a Membership Chair due to much interest in TC2.9 membership and a go to person for processing membership requests; hence, Membership chair position was reinstated. Dean Saputa volunteered to serve as Membership Subcommittee Chair. Katja Auer made a motion to nominate Dean Saputa. Steve Martin seconded. **Voting on Dean Saputa as Membership Subcommittee Chair was as follows: 9/0/2/2/13 (for/against/abstain/absent/total). Dean Saputa as the new Membership Subcommittee Chair was approved.**

New membership roster / changes are reviewed by TC2.9 Chair and will be reported in Montreal in June 2011

TC2.9 Program Subcommittee Report – Sam Guzman, Chair

- Montreal, Summer 2011 “Net Zero”

Forms need to be submitted by 2/14/11

Seminars, Programs, and Forums

- 1.) How to Determine Energy Savings for UV Coil Applications 13 votes
 Suggestions for speakers – Bill Bahnfleth, Forrest Fencl, Bob Scheir
 -Why do it?
 -How to collect data?
 -Determining ROI?
Montreal forms due for submittal by February 14th
- 2.) 1509 Dr. Kaufman – Presentation of Findings 7 votes
 (executive summary) with look to forum program at following meeting. He will submit three papers- 1st regarding lit search and findings, 2nd present and discuss the data, 3rd “now what” practical users guide. **Chicago forms due in April**
- 3.) UL 1995 – Friend or Foe 4 votes
 Forum with Byron Hagen open discussion on proposed standards – forum
Montreal – Sam to get with Byron for 100-word synopsis due February 14th
- 4.) IUVA – Introduction to IUVA 2 votes
 Mary Clancy – Seminar

Voting on TC2.9 acceptance of proposed Top 2 (Determine Energy Savings & UL 1995) for Montreal were as follows: 9/0/2/2/13 (for/against/abstain/absent/total). The Top 2 were approved for Montreal.

9.6 Hospital / Healthcare – co-sponsor a forum on the South African study on the Efficacy of upper air UVGI in a healthcare setting. Chuck Dunn has submitted paperwork and will round up speakers potentially Ed Nardell or Paul Jensen

Scott Sherwood / Forrest Fencil / Sam Guzman will look to put a 15 minute intro/update together for other TCs (i.e 2.4- 9.6) 10 slides, UV basics, point to chapter and handbook reference with an update on current projects. Matt Middlebrooks has offered to help as reviewer and liaison to 2.4. I spoke to Carl Lawson program chair 9.6 he was very receptive and I attended the main 9.6 meeting and spoke to the Chair Mike? And he said they would welcome us in Montreal

Steve Martin mentioned that ASHRAE may do away with free registration for speakers.

Other:

UVGI short course sponsored by TC2.9 – has been approved by ASHRAE – presentation schedule will depend on Bill Bahnfleth's schedule.

Presenter / Course Author: Dr. Bill Bahnfleth - Approved by TC2.9 voting members previously

Primary Contacts: Steve Martin & Katja Auer

UVGI Short Course Outline:

1. UVGI History

- A. How long has it been studied by scientists*
- B. Milestones in air and surface applications*

2. UVGI Fundamentals

- A. Microbial dose response*
- B. Microorganism susceptibility to UVC*
- C. Documentation of UVGI effectiveness*

3. UVGI Equipment

- A. Lamp types*
- B. Ballast types*
- C. Impact of ballast selection on lamp performance*
- D. Operating characteristics of UVGI lamps (wind chill, output depreciation, lamp life)*
- E. Effects of important environmental factors*

4. UVGI Applications and System Design Principles

- A. Upper-air disinfection*
- B. In-duct surface disinfection (coil and condensate pan irradiation)*
- C. In-duct air disinfection*
- D. In-room surface disinfection*
- E. Other specialty applications*

5. Economics of UVGI Technologies Applied to HVAC Systems

- A. Installation capital costs*
- B. Energy savings*
- C. Effects on HVAC system maintenance costs*
- D. Life-cycle cost comparisons*

6. Photodegradation of Materials

7. *UVGI System Maintenance Requirements*

8. *UV Health & Safety Considerations*

A. *Effects of UV exposure to humans*

B. *Safety labeling*

C. *Lamp recycling/environmental considerations*

9. *UVGI Case Study Analysis*

TC2.9 Handbook Subcommittee Report – Steve Martin, Chair

- Applications Handbook draft was submitted on time.
- Waiting for ASHRAE to review and provide feedback.
- Katja Auer was designated by Steve Martin to Chair the new revision of the Systems and Equipment Handbook and contact original contributors to provide feedback on required revisions. She will reach out to the parties before the June meeting in Montreal. Edits required are incorporation of 1509 Reported materials degradation data and elimination of sections repeated in other chapters.
- Katja Auer was designated by Steve Martin to Chair the new chapter for the Fundamentals Handbook

TC2.9 Standards Subcommittee Report – David Marciniak, Chair (not present)

- SPC185.1 Chair: Chuck Dunn – provided update on submitted SPC185.1 draft. Accepted for fast track once all remaining questions have been resolved on draft.
- Report by Dean Saputa SPC185.2
 - Rough draft in good progress – mid year estimated completion date for committee review.
 - A separate meeting was held to meet on the SPC185.2 content / discussion of the chapter.

TC2.9 Research Subcommittee Report - Karin Foarde, Chair

- Karin had requested to move the Research Subcommittee meeting to Monday morning 8am – 10am prior to the TC2.9 Committee meeting to avoid time conflicts. This issue still needs to be fixed for the Las Vegas meeting.
- Notes taken from Research Subcommittee: Updates from Research Subcommittee Chairs Breakfast

1) Up-Date on Current Research Project

- i) 1509-RP, "Study the Degradation of Typical HVAC Materials, Filters and Components Irradiated by UVC Energy" has been awarded to University Dayton Research Institute, Principal Investigator, Robert Kauffman. PMC- Robert Kauffman. PMC- Richard Vincent (Chair), David Witham, Forrest Fencl, Rick Larson, Gary Luepke, David Marciniak, ARTI rep]

The objective of this project is to provide information on the vulnerability of common HVAC materials to UVC so that the use of UV for potential energy savings and IEQ improvements can be maximized. This project will supply data to help in the proper and safe use of UV in an HVAC system. This information will also allow users of Upper Room UV irradiation, Overhead UVGI, or food process disinfection systems to anticipate photo discoloration or photo degradation of materials, and substitute materials that are resistant to UV.

Bob Kauffman gave a presentation on the current status and provided the results of the testing of many materials and his ideas for three papers to come from this research. He has submitted to draft final report to ASHRAE. The PMC needs to review and make a recommendation to the Research Subcommittee Chair on accepting the report. The Research Subcommittee Chair will forward the recommendation to the TC Chair who will send the recommendation to the voting members of the TC for approval.

VOTING ON FINAL REPORT: An email vote to accept the final report on the 1509 Project was sent to all 1509 committee members after the Jan 2011 meeting in Las Vegas. All committee members unanimously accepted the final report in March 2011.

- 2) Updates from Research Subcommittee Chairs Breakfast
 - Research Funding Status
 - Funding available for new research \$1.3M (2011-2012)
 - Currently ASHRAE has a backlog of 23 TRPs that have been awaiting funding since they ran out of money in 2010-2011.
 - This spring the backlog will be reduced and 18 will be released for bid.
 - 4. The 5 not selected will be released in the fall and get moved to the top of the pile over the new ones. Prioritization is helped by co-funding.

[Note: Co-funding from another organization such as ARTI or a government agency was identified in the Research Subcommittee Chairs as being a criteria that could help with getting a RTAR or WS a higher priority; however, a member of the Research Subcommittee pointed out the cofunding can also be provided either directly or indirectly by a company or group of companies within or external to ASHRAE.]

MTGs (Multidisciplinary Task Groups)

New research avenue. Framework being created by TAC (Technical Activities Committee).
Broader mandate than TC.

C. High-Risk, Exploratory Research

- 1. Fund 0 -1 proposal/year of approximately \$100K.

- 3) Work statements & RTARs
 - Currently, the TC has no RTARS or WSs prepared. Therefore, we will have no more research projects. We reviewed the current research plan and the champions agreed to start working. We also added a number of new ideas and champions who will start working.

The champions have agreed to develop the ideas in the research plan into draft RTARS.

TC 2.9 2011-2012 Research Plan

Possible Projects	Champion
What by products of UV degradation can attack HVAC components? What VOC/Odors might be generated from UVGI equipment?	Brian H, Bob Coleman
Convert a combination of 2 previous Field Study Energy RTAR's to Lab Study	Saputa, Sherwood
Upper room UVGI-What is the effect of room air mixing CFD modeling of room equipped with upper air UVGI	Vincent
How effective in UV (254) in reducing Ozone. Can it be quantified.	Geboers

New idea and champions

Possible Projects	Champion

Possible Projects	Champion
Extension of RP1509 to look at UV degradation of materials in the range of 0 to 1000 microwatt range.	Dave Witham, Bob Coleman
What is the UV intensity required to penetrate large AC coils.	Forrest Fencil, Stuart Engle, Jason DeGraw (Penn State)
What type of microorganisms grow on untreated AC coils.	Bob Scheir, Karin Foarde
Can UV damage or cause microorganisms to be altered and thus change their sensitivity to UV or change the organism to something of more concern.	???????, Gus Farris, Karin Foarde

4) RTAR and WS process

- Download RTAR format from ASHRAE website or use the copy handed out at the meeting as a template
- Draft RTAR and submit to others interested in helping you.
- As soon as you get comments back, make revisions as appropriate and when all of the contributors are happy send it to me (Karin Foarde, kkf@rti.org)
- I will review as the ASHRAE Research Subcommittee Chair for things I know ASHRAE has glitched on in the past and send back if I have questions. If not, I will send to Iain Walker, the Section 2 liaison to RAC for review.
- Iain will review. He is pretty fast usually. He will send back review comments and you should make changes as you see fit. He is our champion on RAC. If he sees problems, it makes it difficult to get them through. If you have questions on his comments/suggestions, ask him for clarification.
- Once you have addressed Iain's concerns, I will ask Steve to send it out for a vote.
- The TC generally handles voting very well by email but a quick turnaround is usually required to allow the writers as much writing time as possible.
- Once I receive the TC vote, I will need to fill out the coversheet and submit to Mike Vaughn with the RTAR or WS. The coversheet is on the ASHRAE research website. I will also be required to submit 3 potential bidders on the coversheet so make sure you let me know if you or someone you know might be interested in bidding. Bidders do not need to be members of ASHRAE.

The next due date should be May 15th. If you allow 2 weeks for voting and 3 weeks for review by Iain and me and revisions, you need to have the RTAR to me by April 3rd.

Voting on TC2.9 acceptance of proposed research plan was as follows: 9/0/2/2/13 (for/against/abstain/absent/total). The research plan was approved.

GENERAL BUSINESS

No other general business was noted.

Rick Larson motioned to adjourn the meeting at 11:55 AM. Seconded by Katja Auer. The meeting was adjourned.