

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING
ENGINEERS, INC.**

**1791 Tullie Circle, N.E./Atlanta, GA 30329
404-636-8400**

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 2.9 DATE: Wednesday, 27JUN2012

TC/TG/MTG/TRG TITLE: Ultraviolet Air and Surface Treatment

DATE OF MEEING: Monday, 25JAN2012 LOCATION: San Antonio, Texas

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
See Attached Minutes for List				

DISTRIBUTION

<i>All Members of TC/TG/MTG/TRG plus the following:</i>	
TAC Section Head:	Thomas J. Sobieski (jtsobieski@atlanticbb.net)
TAC Chair:	Charles H. Culp (cculp@tamu.edu)
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters:	Chapter Technology Transfer: Jean-Gabriel Joannette (jgjoannette@pageaumorel.com) Research Liaison: David John (david_john@tampabay.rr.com) Special Pubs: William S. Fleming (flemg@aol.com) Standards Liaison: Hoy R. Bohanon (hrbohanon@workingbuildings.com)
Manager Of Standards Manager Of Research & Technical Services	Stephanie Reiniche (sreiniche@ashrae.org) Michael Vaughn (mvaughn@ashrae.org)

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

Monday, June 25, 2012 – 10:00 to 12:00

San Antonio, Texas

Henry B. Gonzalez Convention Center, Room: 006C (River Level)

These DRAFT minutes have not been approved and are not the official record until approved by the Technical Committee at the 2013 Winter Conference in Dallas, Texas

“TC 2.9 Scope – TC 2.9 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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NOTE: A seminar sponsored by TC 2.9, entitled “Current Design Standards for Upper Air UV Disinfection Installations: Bridging Global Gaps” was scheduled for Monday, June 25 from 09:45 to 10:45 in Room 007D of the Convention Center. The TC 2.9 membership attended the seminar, so the TC meeting was held immediately following the seminar, instead of the 10:00 scheduled start time.

Steve Martin, Chair, called the meeting to order at 10:50 AM. Participants introduced themselves and an attendance sheet was circulated.

8 of 10 Voting Members present. Quorum achieved.

Voting Members Present	Corresponding Members Present	Guests Present
Chuck Dunn	Katja Auer	Joseph Firrantello
Stuart Engel	Bob Coleman	Ashish Mathur
Gus Farris	Forrest Fencl	Brian Rodgers
Jaak Geboers	Brian Hafendorfer	Jeff Roseberry
Sam Guzman	Byron Hagen	Sunil Nanjundaran
Steve Martin	Rick Larson	Tom Sobieski, Section 2 Head
Matt Middlebrooks	Uri Rainisch	Brad Stanley
Dean Saputa	Bob Scheir	Steve Welty
	Richard Vincent	

Steve Martin, distributed copies of the minutes from the TC 2.9 Main Committee meeting held on January 23, 2012 at the ASHRAE Winter Conference in Chicago, Illinois. No changes were noted. Steve Martin made a motion to approve the minutes from Chicago. Motion seconded by Dean Saputa. **Voting on approval of the Chicago meeting minutes was as follows: 8/0/0/2/10 [for/against/abstain/absent/total]. Chicago meetings minutes were approved.**

Chair’s Breakfast Report:

Starting with the 2013 Winter Conference in Dallas, speakers at ASHRAE conferences will be charged a \$95 registration fee. This needs to be conveyed to potential speakers when we ask them to participate in seminars sponsored by TC 2.9. The \$95 registration will give the speaker access to the complete conference, but it does represent a change that may impact the willingness to participate for some potential speakers.

Starting with the 2013 Annual Conference in Denver, the Conferences and Expositions Committee (CEC) is adding a Research Track to the conference program. This track will emphasize ASHRAE-related research efforts. Up to 25% of the Denver program may be allocated to this new track. We need to keep this track in mind as we move forward with our research and program efforts.

As they have done since Montreal, the CEC continues to ask each TC for lists of people willing to serve as paper reviewers and/or session chairs for future meetings. The list below was again sent to our Section Head based on volunteers from the TC. If you would like to be added to the list, please let Katja Auer know.

TC 2.9 List of Volunteers to Serve as Reviewers/Session Chairs For Technical Papers/Sessions Related to Ultraviolet Technologies			
Name	Email	Paper Reviewer?	Session Chair?
Steve Martin	smartin1@cdc.gov	Yes	Yes
Gus Faris	gfaris@nailor.com	Yes	Yes
Richard Vincent	richard.vincent@mountsanai.org	Yes	NO
Brian Hafendorfer	bhafendorfer@trane.com	Yes	NO
Dave Witham	dave.witham@uvdi.com	Yes	NO

All ASHRAE members should receive an email in the near future providing an opportunity to have a letter from ASHRAE President Ronald E. Jarnagin to your employer thanking them for supporting your service on technical committees and standards committees during the 2011-2012 Society year. Letters will be sent by early August. Steve Martin will forward the email when he receives it to ensure all TC 2.9 members get it.

TC 2.9 Website Report: Bob Coleman, Webmaster

Prior to the San Antonio Meeting, the TC 2.9 website was completely up-to-date with all required information.

TC 2.9 Subcommittee Reports

Steve Martin received an email from Karin Foarde, the current Chair of the Research Subcommittee just prior to the San Antonio meeting asking to be replaced. To that end, during the Saturday meeting of SPC 185, Steve Martin asked Richard Vincent if he would be willing to serve as the new Chair. Richard has been extensively involved in the TC research activities for many years and has always attended our

meetings – two requirements of any good subcommittee chair. Richard graciously agreed to serve in the new role. To make it official, Steve Martin made a motion to appoint Richard Vincent as the new TC 2.9 Research Subcommittee Chair. Motion seconded by Dean Saputa. **Voting was as follows: 8/0/0/2/10 [for/against/abstain/absent/total]. Richard Vincent is the new Research Subcommittee Chair.** Steve Martin will make a request for an emergency roster change to the 2012-2013 roster that takes effect on July 1, 2012 to officially note Richard's new role.

TC 2.9 Research Subcommittee Report: Richard Vincent, Research Subcommittee Chair

Richard Vincent attended the Research Subcommittee Chair's breakfast this morning. RAC has some funding for research grants for innovative projects that are generally outside of the research efforts ASHRAE usually funds. Thought should be given to projects that would qualify. The breakfast meeting was informative. Richard will provide a PowerPoint presentation handed out at the meeting for inclusion with these minutes.

Roy McCoy has stepped down as the Section 2 Liaison to RAC. Our new Research Liaison is David Johns. He can be reached at david.john@tampabay.rr.com or rl2@ashrae.net.

TC 2.9 has four RTARs in various states of completion:

RTAR 1669: Measurements of the Response of Cooling Coils to Ultraviolet Radiation for Improved Ultraviolet Germicidal Irradiation Modeling; Lead author: Jason DeGraw (conditionally accepted by RAC)

RTAR 1652: Computational Fluid Dynamics (CFD) for Planning Upper Room UVGI Placement, with Ventilation Systems, in Public Places; Lead author: Richard Vincent (received initial comments back from RAC)

RTAR 1653: Study HVAC System Photodegradation at the Low Level UVC Light Irradiance used for Coil Maintenance and Air Stream Disinfection; Lead author: Dave Witham (received initial comments back from RAC)

Unassigned #: Field Studies to Identify Biofilm Microorganisms on VVAC Cooling Coils and Drain Pans; Lead author: Bob Scheir (yet to be submitted to RAC)

Work will continue to get comments to RTAR 1669 back to our Research Liaison. Once he approves the modification, work will start on developing the Work Statement. As soon as the other three RTARs are revised, they will be sent to our Liaison and up to RAC for further consideration. The upcoming deadlines for RTAR submittals are August 15, 2012 and December 15, 2012.

The number of RTARs being submitted to ASHRAE has dwindled recently. Because of the reduced number of RTARs, it may be easier to fund new projects.

Dr. Robert Kauffman is presenting the first two of three papers generated as part of RP-1509 on Wednesday morning.

TC 2.9 Standards Subcommittee Report: Jaak Geboers, Standards Subcommittee Chair

Chuck Dunn reported that members of SPC 185 worked most of the day Saturday, January 21 formally addressing public comments received during the 45-day comment period on SPC 185.1. 31 of the 32

comments have been adequately addressed. The final comment needing attention involves a standard method to measure reflectance of the galvanized duct material used to construct the test duct. It was determined that Richard Vincent will provide Chuck a reference to an existing CIE standard to address the concern. Chuck will include the reference in the updated Standard and send it out to SPC-185 voting members for final approval via an email ballot. If ASHRAE accepts the handling of the public comments, SPC-185.1 may be published prior to the 2013 Winter Conference in Dallas.

Dean Saputa reported that good progress was made on SPC 185.2. After the work on Saturday, the standard is ready for a final vote on submitting it to ASHRAE for public review. Dean has already sent the final draft standard to SPC-185 voting members for final approval via an email ballot.

TC 2.9 Program Subcommittee Report: Sam Guzman, Program Subcommittee Chair

TC 2.9 had two programs accepted for presentation in San Antonio:

Monday, June 25, 9:45 AM-10:45 AM

SEMINAR 29: Current Design Standards for Upper Air UV Disinfection Installations: Bridging Global Gaps

Track: HVAC&R Fundamentals and Applications; Room: 007D

Chair: Sam Guzman, Member, American Ultraviolet Company, Schooleys Mountain, NJ

1. The Need for Standards for Upper Air UV Applications

Richard L. Vincent, Member, Mount Sinai School of Medicine, New York, NY

2. System Design for Upper Air Disinfection

Shelly Miller, University of Colorado, Boulder, CO

Wednesday, June 27, 9:45 AM-10:45 AM

TECHNICAL PAPER SESSION 8 (ADVANCED)

Study the Degradation of Typical HVAC Materials, Filters and Components Irradiated by UVC Energy

Track: HVAC&R Systems & Equipment; Room: 007A

Chair: Richard L. Vincent, Member, Mount Sinai School of Medicine, New York, NY

1. Study the Degradation of Typical HVAC Materials, Filters, and Components Irradiated by UVC Energy.

Part I. Literature Search (1509-RP) (SA-12-026)

Robert E. Kauffman, Ph.D., University of Dayton Research Institute, Dayton, OH

2. Study the Degradation of Typical HVAC Materials, Filters, and Components Irradiated by UVC Energy.

Part II. Polymers (1509-RP) (SA-12-027)

Robert E. Kauffman, Ph.D.1 and J. Douglas Wolf1, (1)University of Dayton Research Institute, Dayton, OH

Brian Hafendorfer worked with Sam Guzman to spice up the program submissions for the San Antonio Conference and will continue to do so in the future.

During the Program Subcommittee meeting on Sunday, several program ideas were discussed, but it was decided to submit the following three programs for presentation at the 2013 Winter Conference in Dallas:

1. How to determine energy savings for UV coil applications
-Suggestions for speakers – Shelly Miller & Jason DeGraw
-Why do it? How to collect data? Determining ROI?
2. Photocatalytic Oxidation (PCO) – Introduction

- approach 2.3 about teaming up for a submission regarding the status of RP1457 (Project died and was revived)
- Fugiwara is interested in presenting or sharing info
- New research co-coordinator is Mark Anderson, Program Chair is Kyung-Ju Choi (KJ)

3. UV Surface Disinfection

- Approach TC 9.6 about teaming up for a submission regarding UV for surface disinfection
- Primarily mobile devices and or hard mount in room packages

After presenting the three program ideas to the TC, Chuck Dunn questioned whether UV Surface Disinfection in Healthcare facilities is an appropriate area for ASHRAE programs. Considerable discussion ensued, with members and participants clearly taking views on both sides of the issue. After it became obvious that the issue was not going to be settled, Steve Martin suggested that Program Idea #3 above not be submitted for presentation in Dallas and that the issue of TC 2.9 working in the area of healthcare surface disinfection be discussed further in subcommittee meetings at the Dallas Conference.

Sam Guzman and Brian Hafendorfer will work to get Program Ideas 1 and 2 above fully developed and submitted to ASHRAE prior to the early August deadline.

TC 2.9 Handbook Subcommittee Report: Steve Martin, Handbook Subcommittee Chair

TC 2.9 is currently in a good position with Handbook responsibilities. In the last two cycles we have had the new Chapter 60 in the 2011 Applications book and the updated Chapter 17 in the 2012 Systems and Equipment book. Our next formal responsibility is having an updated version of the Applications chapter finalized and accepted by the TC prior to the 2014 Annual Conference in Seattle. To be included with that process, we have recently received three sets of comments from the ASHRAE College of Fellows that should be considered during the chapter update. These comments will be emailed with the minutes for those interested. Steve Martin will work on initial responses to the comments over the next year.

The TC is still interested in pursuing a chapter in the Fundamentals Handbook. Our initial proposal for a chapter was rejected by the ASHRAE Handbook Committee in Montreal by a 8-10 vote. There is no further chance to get a UV chapter in the 2013 Fundamentals book at this time. However, Steve Martin and Dean Saputa will work on a new proposal to take to the Society Handbook Committee at the 2013 Dallas Winter Conference.

TC 2.9 Membership Subcommittee Report: Dean Saputa, Membership Subcommittee Chair

Dean Saputa reported that the TC 2.9 roster moving forward into 2012-2013 is complete. The only change that needs to be made is an emergency roster change to list Richard Vincent as our new Research Subcommittee Chair. Steve Martin will submit that request to Tom Sobieski (Section 2 Head).
NOTE: Request was sent via email on June 26, 2012.

The 2012-2013 roster is somewhat imbalanced with manufacturers. During the next roster update period, more attention needs to be placed on roster balance.

People interested in joining TC 2.9 can find instructions for getting on the TC roster on the ASHRAE website at: <http://ashrae.org/technology/page/1705>. If you would like added to the TC roster as a corresponding member, please let Dean Saputa know.

General Business

Byron Hagan and Brian Rogers provided a brief update on UL1995, and in particular, the ongoing UV aspects of the testing standard. Significant accomplishments have been made for including UV installations in the standard. A few tricky issues remain to be resolved. Forrest Fencil mentioned that he had been tasked with asking TC 2.9 to settle on a single term to use within UL1995. In the current draft standard, these terms are currently used interchangeably: “relative spectral effectiveness,” “effective irradiance,” and “absolute irradiance.” After considerable discussion, TC 2.9 decided on using the term “UVC irradiance” to replace all three terms above. Brian Rogers mentioned that the two other key issues to be addressed are: 1) determining how many elbows/bends and/or distance needs to be between in-duct mounted UV devices and the air handling unit before they are considered uncoupled for purposes of the standard, and 2) the possibility of UV fixtures serving as an ignition source should flammable refrigerants leak from coils. Regarding, issue 2 above, Jaak Geboers noted that UV fixtures are exactly the same as fluorescent lamp fixtures that might be installed in air handling units, and that standards for fluorescent lighting in explosion proof settings already exist. Jaak will provide Brian Rogers the available information. The UV manufacturers involved with UL1995 will continue working through issue 1 until it is properly resolved. Byron Hagan noted that Mark Hinkleman will probably be scheduling the next conference call to work on the standard sometime in July.

Katja Auer noted that the UV safety document she drafted for ISO 142/WG 2 was recently approved, with comments, although the US abstained from the vote because they were not given proper guidance from the US Technical Advisory Group

Dean Saputa mentioned that he is serving as the TC 2.9 representative to a newly-formed ASHRAE “Air Filtration and Cleaning” Position Document Committee. The committee will hold its second meeting during the San Antonio Conference. Anyone interested was invited to attend.

Steve Martin noted that on the Technical FAQ area on the ASHRAE website, FAQ #23 is “What is ASHRAE’s recommendation on the use of ultraviolet light in air systems for microbial control?” Historically, this question has been assigned to TC 2.4 for an answer, and there is an adequate answer currently on the website. However, after the Chicago Winter Conference, TC 2.9 was appointed as the cognizant TC for this FAQ. Steve Martin passed out an updated answer to the FAQ, complete with updated references. He made a motion for TC 2.9 to approve the updated answer to FAQ #23 for submission to ASHRAE for posting on the website. Seconded by Chuck Dunn. **Voting was as follows: 8/0/0/2/10 [for/against/abstain/absent/total]. The updated FAQ #23 was approved.** NOTE: Steve Martin forwarded the updated FAQ #23 to ASHRAE via email on June 26, 2012.

Chuck Dunn noted the lack of power strips in the meeting room. He suggested we specifically ask ASHRAE for additional power strips at future meetings.

No other new business was noted.

Steve Martin thanked everyone for their participation on the TC during his two years as Chair. Katja Auer motioned to adjourn the meeting at 12:00 noon. Motion seconded by Gus Faris. The TC 2.9 Main Committee Meeting was adjourned.