

**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. TC9.11 Clean Spaces DATE 1/25/16

TC/TG/MTG/TRG TITLE Clean Spaces  
DATE OF MEETING 1/25/16 LOCATION Orlando

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
R Vijayakumar	2014	Gordon Sharp	2012	Jacob Edmondson CM
Arthur Giesler	2015	Tim Walsh	2015	Roger Lautz CM
Dominador De Guzman Castro, Jr.	2015	Vinod Gupta	2013	Paul Lemestre CM
Michael Amstadt	2013	Gabriel Jimenez MNQ	2013	Cesar Luis D Lim CM
Roland Charneux	2014			Julian Roxhester CM
Kenneth Mead	2014			Wei Sun CM
Phillip Naughton	2015			Peter Gardner CM
Mitchell Swann	2014			Kishor Khankari CM
Ivan Thomas	2012			John Varley CM
Gary Shamsioian	2015			Krishnan Gowri TAC SH
Vincent Sakraida	2015			Les Goldsmith 203-217-6325 lgoldsmith@envirco.com
				Juunke Want 405-215-3829 juunke.wang@ou.edu
				Oluwaseyi Ogunsola 4055352138 oogsola@ou.edu
				Mark Mueller 9192705293 markm@nnpsharmanlan.com
				Alejandro Rivas 4054133082 alejandro.rivas@ou.edu
				Kim Hagstrom +358 405 232 526 Kim.hagstrom@halm.com
				Mike McGraw 9197776244 mmcgraw@envirco.com
				Elise Backstrom 5158673811 eliseb@iastate.edu
				Howard Abranowiz 310-836-3715

**DISTRIBUTION**

*All Members of TC/TG/MTG/TRG plus the following:*

TAC Section Head:	<a href="mailto:lynnwerman@yahoo.com">lynnwerman@yahoo.com</a> , Krishnan.gowri@autodesk.com
TAC Chair:	<a href="mailto:Lawrence@engr.uga.edu">Lawrence@engr.uga.edu</a> , eric.adams@carrier.utc.com
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters:	<a href="mailto:cameronl@tgce.com">cameronl@tgce.com</a> , <a href="mailto:michael.heinrich@westplainsengineering.com">michael.heinrich@westplainsengineering.com</a> , <a href="mailto:slevisieur@haddadeng.com">slevisieur@haddadeng.com</a> , <a href="mailto:jeff@thompsonengineers.com">jeff@thompsonengineers.com</a> , <a href="mailto:nbidstrup@grundfos.com">nbidstrup@grundfos.com</a>
Manager Of Standards Manager Of Research & Technical Services	Stephanie Reiniche sreiniche@ashrae.org Mike Vaughn morts@ashrae.net

**Meeting Report:**

**ASHRAE Annual Meeting  
Orlando, Monday, January 25th, 2016**

1. Chairman Art Giesler called the meeting to order at 2:15 PM. Eleven out of fifteen voting members including the chair were present at the start of the meeting. Non-Quorum member absent.

All voting members, corresponding members and guests were self-introduced.

2. **Minutes:**

Wei Sun moved to accept the Atlanta meeting minutes. Motion second by Ken Mead.

Motion passed (10/0/0 CNV)

3. **Membership:**

Following individuals are rolling on as voting members: Phillip Naughton, Vincent Sakraida, Tim Walsh (Siemens)  
Rolling off : Kishor Khankari, Peter Gardner, Matt Middlebrook, David Poetker, Wei Sun, John Varley, Christopher Weaver.

4. **Chair Report:**

- A new ASHRAE group has been formed for ASHRAE strategy planning for enhanced society impact.
- TC 911 is open to new voting members.
- New TC Websites for committees

5. **Subcommittee Reports:**

- 5.1 **HANDBOOK**

- The ASHRAE Handbook Clean Spaces chapter of the handbook has been completed and was published last year. If there is anyone interested in contributing, we can still add color photos, videos and more updates to the digital version of the handbook anytime appropriate even between printed version updates.

- 5.2 **JOURNAL- MICHAEL AMSTADT**

- No articles were published in the last 6 months

- 5.3 **WEB PAGE – JO JO CASTRO**

- The website for TC 9.11 has been updated. The list of attendees the meeting minutes in additional documents can be added to the webpage. Listserve will be used to plan and coordinate webpage updates.

- 5.4 **RESEARCH**

- Critical data is being gathered on an ongoing basis. With five facilities total, four have been documented so far. Some expectations are being validated, such as traditional air change rates are much higher than needed. The team has requested a time extension from March 1 to May 1 and they are working with two more facilities to collect data for a total of seven all together. A draft will be ready for TC review by the end of March and then on March 21 they will go back to the university for completion of final measurements. The team has been documenting more than just temperature and velocity information items like including room operational descriptions which will help identify miscellaneous factors that can impact clean room air quality. The motion to approve an extension to May 1 was seconded and approved by the committee.
- Wei Sun gave an overview of research project 1604 which is demand based clean room airflow control for particulate loading impact. The RTR has a one-year time extension till March 31, 2017, but no cost extensions. Where is nearing completion of the mobile clean room testing lab built in shipping containers for some of the readings. The mobile testing lab has a clean room the prep room gown rooms using four VAV boxes where air change rates up to 600 exchange rates can be tested; HEPA and ULPA filters can be tested

## Technical Committee 9.11: Clean Spaces

per ISO procedures, and parameters such as air change rates individual room air flows room to room pressurization and other parameters can be adjusted for advanced testing programs. There are particle sensors in the rooms in the return ducts in the air handler is self-contained on wheels at the ground level. Each room is sealed and pressure tested for airtight construction and yields real-time readings for all parameters. There are options for low wall or floor returns need to be reconfigurable for each type of test. ISO 5, 6, 7, and 8 environments can be tested per ISO procedures. The mobile lab was built at no cost to ASHRAE. The original readings were done in Pennsylvania existing lab.

- Vijay moved to accept an extension of the research project 1604 at no cost to ASHRAE to March 31<sup>st</sup> 2017  
Seconded by Roland Charneux  
Motion passed (10/0/0 CNV)
- Mitch Swan moved to accept the extension of the research project 1399 at no cost to ASHRAE to May 31<sup>st</sup> 2016, seconded by Vijay  
Motion passed (10/0/0 CNV)
- New RTAR suggestions have come in to the committee program, including one from Peter Gardner.

### 5.5 PROGRAMS :

- The Forum on Air Change Rate chaired by Kishor was well attended in the morning
- See <http://ashraem.confex.com/ashraem/w17/cfp.cgi> for due dates for Las Vegas.
- See <http://ashraem.confex.com/ashraem/s17/cfp.cgi> for due dates for Long Beach.
- For Orlando, Kishor propose a seminar on Air Change Rates
- For Orlando, Wei Sun propose a seminar on energy efficiency in industrial labs
- Speakers ratings are being changed using a three strikes basis.

### 5.6 DESIGN GUIDE : WEI SUN

- Cleanroom design guide parts 1 and 2 are under a final review. The completed parts 1 and 2 will be sent to the ASHRAE publishing manager, Mark Owens.

### 5.7 SHORT COURSE-VIJAY

- No report

### 5.8 ENERGY EFFICIENCY – PHIL NAUGHTON

- The Cleanroom Energy Efficiency white paper, which is being reviewed by the subcommittee now.

## 6. Liaison Report

### 6.1 IEST –Wei Sun

- Wei Sun is the president of the IEST, which is publishing updates soon. This includes a harmonization with other international standards. New areas covered include nano filter ratings for particles between 2 and 100 µm. ISO 14644, parts 1 and 2 are being revised; the title of the standard has changed as well as significant content updates in particle concentrations and monitoring standards. Part 3 is being finalized in the middle of 2016 and part for his under initial revision now. Part 16, which is energy conservation for cleanrooms, will be completed by mid 2017.

### 6.2 ISPE –PETE GARDNER

- ISPE is working on a filter guide

## Technical Committee 9.11: Clean Spaces

### 6.3 CDC/NIOSH – KEN MEAD

- Closed and transport devices (Ambulance) research

### 6.4 TC 9.6 Healthcare – ROGER LAUTZ

- Possible collaborations with TC 9.6 healthcare were discussed the humidity study literature review is done. TC 9.10 is a cosponsor of the TC 911 seminars.
- Research on where the data of Standard 170 comes from

### 6.5 TC 7.2 Design Build Contractor and TC7.1 Integrated Building Design – Mitch Swann

- Integrated Building Design TC is seeking comparisons of design build versus design bid build experiences.

### Old business

None

DRAFT

## Technical Committee 9.11: Clean Spaces

### 8. New business

- Roger Lautz expressed interest in being a new voting member
- Phil Naughton is now the standard subcommittee chair
- Secretary position is been filled by Michael Amstadt.

### Adjournment:

Meeting adjourned at 4:14 PM

Respectfully Submitted,  
Michael Amstadt

DRAFT