

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

1791 Tullie Circle, NE / Atlanta, GA 30329
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TECHNICAL COMMITTEE 9.11 MEETING REPORT

**TECHNICAL
COMMITTEE (TC):**

9.11

TC TITLE:

CLEAN SPACES

DATE OF MEETING:

January 28th, 2013

LOCATION:

Dallas

DATE RE-ISSUED:

Draft (Rev. 0)

RECORDED BY:

R. Charneux

VOTING MEMBERS	YEAR		PRESENT (Y/N)	Sub-committee Chairs	
	On	Off			
Arthur Giesler	07/09	06/13	Y	Handbook	Gary Shamsioian
Shih-Cheng Hu	07/09	06/13	N	Research	Vinod P. Gupta
Larry Hughes	07/09	06/13	N	Programs	Peter B. Gardner
Kenneth Mead	07/09	06/13	Y	Web Page	David Poetker
R. Vijayakumar	07/09	06/13	Y	Journal	Michael Amstadt
Christopher Weaver	07/09	06/13	N	Design Guide	Wei Sun
Charlie Shieh	07/10	06/14	N	Short Course	R. Vijayakumar
Pete Gardner	07/11	06/15	Y		
David Poetker	07/11	06/15	N		
Wei Sun	07/11	06/15	Y		
Matt Middlebrooks	07/11	06/15	Y		
John Varley	07/11	06/15	Y		
Kishor Khankari	07/12	06/14	Y		
Paul Lemestre	07/12	06/14	Y		
Gordon Sharp	07/12	06/16	Y		
Ivan Thomas	07/12	06/16	Y		

Technical Committee 9.11: Clean Spaces

CORRESPONDING MEMBERS (CM)	PRESENT (Y/N)	CORRESPONDING MEMBERS (CM)	PRESENT (Y/N)
Dennis Ligsay Alejandro	Y	Chris Malanga	N
M. Scott Alexander	N	Norm Maxwell	N
Michael Amstadt	Y	Roderick G McLeod	N
Nejat Babur	N	Susan D Morrison	N
Russell T Bailey	N	Mark A Mueller	N
Kimberly A Barker	N	Christopher O Muller	N
Cheryl Baylie	N	Gredory M Munter	N
James R Beasley	N	Philip J Naughton	Y
David Bess	N	Eric Z Nejat	N
Steve Blaine	N	Victor A Neuman	N
Reg Brown	N	Sean O'Reilly	N
Bernardo Cardenal	N	Taner F Ozkaynak	N
John P Castelvechi	N	Riyaz A Pappar	N
Dominador De Guzman Castro Jr.	Y	Sharad V Paranjape	N
Robert E Chase	N	Zivojin B Perisic	N
Allan D. Chasey	N	Kent W Peterson	N
Kyung-Ju Choi	N	David Y.H. Pui	N
Donald J Clarke	N	Mark A Renn	Y
James J Coogan	N	Christopher S Robertson	N
Manuel A Del Valle	N	Julian Rochester	N
Low Han Guan Den	N	Peter H Rumsey	N
Charles E Dunn Jr.	N	Vincent A Sakraida	Y
David S Ensor	N	Emil Sandru	N
Christopher Flaherty	N	Raymond K Schneider	N
William H Frantz	N	Ted N Schnipper	N
Daniel Albert Ghidoni	N	EC "Chuck" Schroeter	N
Vinod P Gupta	Y	Anad K Seth	N

Technical Committee 9.11: Clean Spaces

CORRESPONDING MEMBERS (CM)	PRESENT (Y/N)	CORRESPONDING MEMBERS (CM)	PRESENT (Y/N)
Gabriel A Jimenez	Y	Ronald E Hill	N
Michael D Jue	N	Michael Shelton	N
Yu-Hao Kang	N	Charles W Soltis	N
Hemant S Kavathekar	N	Kevin A Sweeney	Y
Charles F Kern	N	William Tschudi	N
Kevin D Knappmiller	N	George E Wells, III	N
Elizabeth A Kolacki	N	Philip J Winters	N
Thomas H Kuehn	N	Tengfang Tim Xu	Y
William A Kumpf	N	Thomas R Spearman	N
D. Randall Lacey	N	Michael M Starke	N
Matthew C Lemieux	N	Fu-Jen Wand	N
Cesar Luis D L Lim	Y	Richard B White	N
Zhongping Lin	N	Alfred W Woody	N
Junjie Liu	N	Gary Shamshoian	Y
Dawen Lu	N	Roland Charneux	Y
		Satish Dinakaran	Y
		Roger Lautz	Y
		Farhan Adil Mehboob	Y
		Jose F. Palma	Y
		Mitchel Swann	Y

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ADDITIONAL ATTENDEES

Yi Yin	Y
Jack Zarour	Y
Li-Ming Lo	Y
Davor Novosel	Y

SOCIETY LIAISONS, ETC.

Thomas Lawrence	TAC Section 9 Head	N
Kishor Khankari	Section 9 Research Liaison	Y

Meeting Report:

**ASHRAE Annual Meeting
Dallas, Monday, January 28th, 2013, 2:20 – 4:20 PM**

1. Chairman Kishor Khankari called the meeting to order at 2:20 PM. Eleven (11) voting members including the chair were present, on a total of 16 voting members (including one international).

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

2. **Minutes:**

Wei Sun moved to accept Dallas annual meeting minutes second by Vijayakumar.

Motion passed (10/0/0 CNV)

3. **TC Breakfast Report:** (Kishor Khankari)

- High Tower recipient is M. Lucas Hyman of TC-1.10
- New TAC presentation template for TC members to use with their local chapter available
- Employment discipline added to ASHRAE bio online input form
- A new MTG-CCDG has been formed on cold climate design guide development
- A minimum 95\$ registration fees for speakers started in Dallas
- Web meetings available for sub-committee meetings. Contact Mike Vaughn; mvaughn@ashrae.org

4. **Membership:**

Membership is strong for TC-9.11.

- Rolling off as June 30, 2013
Larry Hughes
Shi Cheng Hu
Art Giesler
- Continue to balance rolling off and on
Kenneth Mead
R. Vijayakumar
Christopher Weaver
- Rolling on
Vinod P. Gupta
Michael Amstadt

5. Sub-committee reports:

5.1 HANDBOOK – GARY SHAMSHOIAN

- Many challenges and opportunities
- Already received some inputs
- Potential areas
 - Sustainability
 - Airborne particle control
 - Consistency with ISO
 - Reference to FDA
 - International issues
 - Figures
- Improvement to chapter, not a full re-write
- Good start on volunteers
- Interested persons to provide their business card to Gary

5.2 JOURNAL – MICHAEL AMSTADT

- This month in pharmaceutical ISPE, an article on filter selection
- No new article in ASHRAE journal
- Wei will prepare an article for the journal

5.3 WEB PAGE – DAVID POETKER

- An update is needed when feasible

5.4 RESEARCH – VINOD GUPTA

- Research project above 200,000 have to be approved by the board
- RP between 100,000 and 200,000\$ to be approved by tech council
- RP smaller than 100,000 approved by RAC
- For WS-1399 Art and Kishor will speak to Michael Vaughn
- The opinion of the committed is to keep the same work statement
- Mitch will ask bidders to have a commitment
- RP-1604 is proceeding, meeting held yesterday (Sunday, January 24th). M. Sun asks for a one year extension, and the RP committee accepted at no cost for ASHRAE
- RP-1604, a correction is requested in the title "Demand based flow" instead of "Demand based filtration"

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RTARs that have not been approved by RAC: TC Needs to prioritize these and add any new ones.

- A. **"Primary / Secondary Air Loop Design for Cleanrooms"**
Current Status – **RTAR needed.**
Contact – Wei Sun will prepare RTAR
Comments –
- B. **"Application of Established Contamination Control Strategies for Spaces other than Cleanrooms"**
Current Status – **RTAR needed.**
Contact – Roger Lautz
Comments – Focus on health care facilities in collaboration with TC9.6. It was decided to keep on hold.
- C. **"Automated Room Air-tightness Test Technique By Using Room-Equipped Airflows Control Devices In Critical and Controlled Environments"**
Current Status – **RTAR needed.**
Contact – Dr. Jin Wen, Drexel University
Comments – No correspondence after initial e-mail.
- D. **"How many rooms should be placed on one HVAC zone controller with terminal HEPAs"**
Current Status – **RTAR needed**
Contact – Gary Shamshoian
Comments –
- E. **"no shutdown" HVAC cleanroom system"**
Current Status – **RTAR needed**
Contact – Gary Shamshoian
Comments –

Approved RTARs & Work Statements that are being resubmitted to RAC:

- A. **"Survey of Particle Production Rates from Various Cleanroom Activities & Processes" (1399-WS)**
Current Status – **RAC suggests that project be rebid. Single bid was received and was rejected by RAC in San Antonio. Released for bid in 2011. Review reasons why recommended bidders did not bid. A request for re-bid should be sent to MORTS along with updated revised WS with additional recommended bidders added. Request revised WS and recommended bidders list by 2/14/13.**
PES – Mitch Swann (Chair), Pete Gardner, John Varley, Wei Sun

Status of "Active" Research Projects

1. **"Demand Based Flow For Clean Rooms" (RP 1604)**
Current Status- One year extension at no cost for ASHRAE
PMS –R. Vijayakumar (Chair), Roland Charneux, Gordon Sharp, Bill Tschudi, Kishor Khankari

Completed Research Projects

1. **"Analysis of Transient Characteristics, Effectiveness and Optimization of Cleanroom Airlocks" (RP 1431)**
Current Status – **Final report will be available for members to download**
P.I. – Mr. Wei Sun, Engsysco Inc.
PMS – Kishor Khankari (Chair), John Varley, Phil Winters
2. **"Cleanroom Pressurization Strategy Update – Quantification and Validation of Minimum Pressure Differentials for Basic Configurations and Applications" (RP 1344)**
Current Status – **Technical Paper, Predictive to Practice, Monday Jan 28,13 8.00 AM-9.30 AM**
Mr. Wei Sun- will present results of completed research project RP-1344
PES – Jim Coogan (Chair), Victor Neuman, R. Vijay, Kishor Khankari, Roger Lautz

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5.5 PROGRAMS : P. GARDNER

- 5.5.1 San Antonio
- 5.5.1.1 Seminar 2 : clean room mechanical system design and operation
- 5.5.2 Denver
- 5.5.2.1 Gupta – Forum – Energy and contaminant control issue
- 5.5.2.2 Sharp – Seminar – Demand Control Ventilation
- 5.5.2.3 Sun – Seminar – International clean room design
- 5.5.2.4 Swann – Seminar – Integrate Design Build

5.6 DESIGN GUIDE : WEI SUN

- Some progress done
- Wei will do a push from now to Denver
- Review/edit by Roland, Tim and Mitch
- Send sections to entire committee for comments

5.7 SHORT COURSE – R. VIJAYAKUMAR

- Not rescheduled
- The content was left to download after web course
- TC-9.11 should find a way to review and solve this issue

6. Liaison Report

6.1 NFPA – ROGER LAUTZ

No report

6.2 IEST/ISO – R. VIJAYAKUMAR

An all day course on gas phase application is available

6.3 ISPE – PETER GARDNER

A conference on critical utilities will be held in Tampa

6.4 LBNL – TIM XU

No active project related to TC-9.11 actually

Tom will prepare a list of active projects

6.5 CDC/NIOSH – K. MEAD

Actually focusing on healthcare

Also focusing on nanomaterial control

6.6 TC-9.6 HEALTHCARE – ROGER LAUTZ

- No report

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6.7 TC-9.10 LABORATORY SYSTEMS – P. GARDNER

- Nothing to report

6.8 TC-2.3 GASEOUS AIR CONTAMINANT REMOVAL – MATT MIDDLEBROOK

- Two RP projects
- One on PCO – photocatalytic oxydisers
- One on adsorption

6.9 TC-2.4 PARTICULATE AIR CONTAMINANTS REMOVAL – M. RENN

- No report

6.10 EUROPEAN CLEAN ROOM ASSOCIATIONS – VIJAYAKUMAR

- Standard on nanoparticle in development in Europe

6.11 UNIVERSITY OF MINNESOTA – DAVID PUI/T. KUEHN

- No report

6.12 NEBB – D. HILL

- Nothing to report

6.13 CHINA – YI YIN

- Pharmaceutical clean rooms to be updated due to GMP requirements

7. Old business

None

8. New business

- 8.1 Kishor will plan for a web meeting before Denver meeting.

Adjournment:

Meeting adjourned unanimously at 4:20 pm

Proposed by Peter Gardner, seconded by Gordon Sharp.

Please review and discuss at Denver meeting

Respectfully Submitted,
R Charneux
TC-9.11 Corresponding member