

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

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TECHNICAL COMMITTEE 9.11 MEETING REPORT

**TECHNICAL
COMMITTEE (TC):**

9.11

TC TITLE:

CLEAN SPACES

DATE OF MEETING:

June 24th, 2013

LOCATION:

Denver

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	M. Castro
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	N		
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	N
James J Coogan	N	Christopher S Robertson	N
Manuel A Del Valle	N	Julian Rochester	Y
Low Han Guan Den	N	Peter H Rumsey	N
Charles E Dunn Jr.	N	Vincent A Sakraida	N
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	N	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	N
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	N
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	N
		Roger Lautz	N
		Farhan Adil Mehboob	N
		Jose F. Palma	Y
		Mitchel Swann	Y

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ADDITIONAL ATTENDEES

Joel Davis	Y
Jack Zarour	Y
Li Song	Y
Davor Novosel	Y
Zacc Poots	Y
Gary Miller	Y

SOCIETY LIAISONS, ETC.

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

Meeting Report:

ASHRAE Annual Meeting Denver, Monday, June 24th, 2013, 2:20 – 4:20 PM

1. Chairman Kishor Khankari called the meeting to order at 2:20 PM. Ten (10) 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 (9/0/0 CNV)

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

- All ASHRAE members should update their bios to indicate their employment category.
- All members can fill a request to obtain a Distinguished Service Awards if they fill the requirements.
- For the Denver meeting there was 65 Technical papers submitted, 41 accepted and 11 sheduled
 - 187 Conference papers submitted, 82 accepted and 22 scheduled
 - 79 Seminars submitted, 47 accepted and 47 scheduled
 - 20 Forum submitted, 4 accepted and 4 scheduled
- 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 as of July 1st, 2013
Kenneth Mead
R. Vijayakumar
Christopher Weaver
- Rolling on as of July 1st, 2013
Vinod P. Gupta
Michael Amstadt

5. Sub-committee reports:

5.1 HANDBOOK – GARY SHAMSHOIAN

- First draft will be sent in the next few weeks
- Lot of input received from Tim and Gordon
- 18 people gave their names, if others are interested, contact Gary
- Find TC-9.11 handbook liaison for the deadline of committee approval
- Gary will establish a calendar to reach the deadline.
- Phil Naughton accepted to review in regards to the Electronic Industry
- The printed version is the legal version. Electronic version can be expanded.

5.2 JOURNAL – MICHAEL AMSTADT

- There was an article on filtration few months ago.
- Energy efficiency in cleanrooms can be a good topic for a journal article. The following persons are potential candidates to participate: Phil Naughton, Gary Shamshoian, Tim, Vince Sakraida, Bill Tschudi
- Wei Sun could adapt a transaction paper for the Journal

5.3 WEB PAGE – JOJO CASTRO

- Jojo Castro will be the new TC-9.10 Webmaster.
- An update is needed.
- The potential of LinkedIn will be analysed.

5.4 RESEARCH – VINOD GUPTA

- The President theme is “Shaping the future”. Our RTARs could take advantage of this theme.
- Kishor and Art are members of RAC and can help RTAR authors to improve their documents.
- Money is actually available for research.
- **1399 WS, Mitch Swann**
 - 4 bids were received. Additional questions were sent to the 4 bidders and answers were received from these 4 bidders. PMS to analyse the answers and will make recommendations to the TC.
- **RP 1604, Vijay**
 - RP progress correctly, measurements should start in October. On line meeting every month as needed for continuous monitoring to ease the process.

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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 – **This RTAR is removed**
Contact –
Comments –
- B. "Application of Established Contamination Control Strategies for Spaces other than Cleanrooms"
Current Status – **M. Kenneth Mesd will contact Roger Lautz to see if this RTAR still 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. M. Wei Sun will contact M. Wen**
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 – **This RTAR is removed**
Contact –
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 – PES is doing the required follow-up
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 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 in New-York.
PES – Jim Coogan (Chair), Victor Neuman, R. Vijay, Kishor Khankari, Roger Lautz

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5.5 PROGRAMS : P. GARDNER

5.5.1 Denver

5.5.1.1 Forum 3, Chaired by Vinod P. Gupta. Review of issues in contamination Control for Cleanroom facilities. Wednesday, June 26, 9H45-10H45, Governors Square 17

5.5.2 New-York

5.5.2.1 Sun – Seminar – Modular Cleanroom

5.5.2.2 Sun – Seminar – International Cleanroom design

5.5.2.3 Vinod P. Gupta, Gordon Sharp and Jack Zarour are interested to participate to the above mentioned seminars

5.6 DESIGN GUIDE : WEI SUN

- Wei sent out sections 1, 2 and 3 for contributors to review.
- July 15th is the deadline for the contributors to give their inputs.
- There is actually 30 co-authors and 80 contributors listed.

5.7 SHORT COURSE – R. VIJAYAKUMAR

- Nothing to report.

6. Liaison Report

6.1 NFPA – ROGER LAUTZ

No report

6.2 IEST/ISO – R. VIJAYAKUMAR AND PHIL NAUGHTON

IEST is revising documents related to Cleanroom, 3 or 4 revisions.

ISO is developing standard on test method for nano-filtration

ISO 14 694 and 14 698 are open for comments. Phil Naughton can provide restricted copy for revision/comments.

There is a call for paper for a conference sponsored by IEST in may on contamination control.

Wei will V-P for contamination control for IEST

6.3 ISPE – PETER GARDNER

ISPE is working on a sustainable design guide.

6.4 LBNL – TIM XU

No report

6.5 CDC/NIOSH – K. MEAD

No report

6.6 TC-9.6 HEALTHCARE – ROGER LAUTZ

No report

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6.7 TC-9.10 LABORATORY SYSTEMS – P. GARDNER

- TC-9.10 is completing the revision of its design guide.

6.8 TC-2.3 GASEOUS AIR CONTAMINANT REMOVAL – MATT MIDDLEBROOK

- Standard finalized on gaz filtration.
- Research on PCO – photocatalytic oxydisers continues

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

To be removed from the list

6.10 EUROPEAN CLEAN ROOM ASSOCIATIONS – VIJAYAKUMAR

- To be removed from the list

6.11 UNIVERSITY OF MINNESOTA – DAVID PUI/T. KUEHN

- To be removed from the list

6.12 NEBB – D. HILL

- To be removed from the list

6.13 CHINA – YI YIN

- To be removed from the list

7. Old business

None

8. New business

1. Mitch Swann suggest that TC-7.1 Integrated Building design and TC-7.2 Design Built should have liaison with TC-9.11.
2. Kishor will plan for a web meeting before New-York meeting.

Adjournment:

Meeting adjourned unanimously at 4:20 pm

Proposed by Wei Sun, seconded by Peter Gardner.

Please review and discuss at Denver meeting

Respectfully Submitted,
R Charneux
TC-9.11 Corresponding member