### AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.
1791 TULLIE CIRCLE, N.E./ATLANTA, GA 30329  
404-636-8400

#### TC/TG/TRG MINUTES COVER SHEET

<table>
<thead>
<tr>
<th>TC/TG/TRG No</th>
<th>MTG.ACR</th>
<th>DATE</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC/TG/TRG TITLE</td>
<td>Multidisciplinary task group on air changes rates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DATE OF MEETING</td>
<td>October 30th, 2020</td>
<td>LOCATION</td>
<td>Web Meeting</td>
</tr>
</tbody>
</table>

#### Members Present

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kishor Khankari</td>
<td>Chair</td>
</tr>
<tr>
<td>Roland Charneux</td>
<td>Vice-chair</td>
</tr>
<tr>
<td>Henry Hays</td>
<td>TC-2.2</td>
</tr>
<tr>
<td>Bob Burkhead</td>
<td>TC-2.4</td>
</tr>
<tr>
<td>Jose Palma (Alt)</td>
<td>TC-5.3</td>
</tr>
<tr>
<td>Jim Coogan</td>
<td>TC-9.10</td>
</tr>
<tr>
<td>Phil Naughton</td>
<td>TC-9.11</td>
</tr>
<tr>
<td>Kevin A Scarlett</td>
<td>SSPC-170</td>
</tr>
<tr>
<td>James Bennett (Alt)</td>
<td>NIOSH</td>
</tr>
<tr>
<td>Clifford Cooper (ALT)</td>
<td>AIH</td>
</tr>
</tbody>
</table>

#### Members Absent

<table>
<thead>
<tr>
<th>Name</th>
<th>TC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gaylon Richardson</td>
<td>5.3</td>
</tr>
<tr>
<td>Michael Connor</td>
<td>9.02</td>
</tr>
<tr>
<td>Roger Lautz</td>
<td>9.6</td>
</tr>
<tr>
<td>Daniel Doyle</td>
<td>I2SL</td>
</tr>
</tbody>
</table>

#### Additional attendance

<table>
<thead>
<tr>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joe Zulovitch (Alt TC-2.2)</td>
</tr>
<tr>
<td>Gary Goodson, webmaster</td>
</tr>
<tr>
<td>Carl Huber</td>
</tr>
<tr>
<td>Glen Friedman</td>
</tr>
<tr>
<td>Shervin Shoai Naini</td>
</tr>
<tr>
<td>Yusuf Bhetasi</td>
</tr>
<tr>
<td>Fred Betz</td>
</tr>
<tr>
<td>Ehsan Mousavi</td>
</tr>
<tr>
<td>Travis English</td>
</tr>
<tr>
<td>Larry Howlett</td>
</tr>
</tbody>
</table>

### DISTRIBUTION

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

<table>
<thead>
<tr>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAC Section Head</td>
</tr>
<tr>
<td>TAC Chair</td>
</tr>
<tr>
<td>All Committee Liaisons As Shown On TC/TG/TRG Rosters</td>
</tr>
<tr>
<td>Standards liaison : Manager of Research &amp; Technical Services</td>
</tr>
<tr>
<td>Research liaison</td>
</tr>
</tbody>
</table>
1. **Call to order 11:05 (EST) and Introduction**  
   Kishor Khankari called the meeting to order and established a quorum with 10 (6 voting plus 3 alternate plus the Chair) out of 13 voting members (including chair).  
   Kishor reminds every attendee to adhere to the ASHRAE code of ethics.

2. **Approval of the Agenda**  
   The agenda is approved as submitted by Kishor Khankari.

3. **Approval of Minutes**  
   A motion to approve the July 10th, 2020, minutes, proposed by Clifford Cooper and seconded by Kevin A Scarlett (9-0-0-CV). Approved.

4. **Meeting dates**  
   The winter MTG.ACR Web Meeting date to be determined. It should be in January.

5. **Report from Members**  
   No additional news from MTG-ACR Members.

6. **Role of ACR in current pandemic - comments**  
   ACR are used because simple and easy to use  
   Near field exposure for coronavirus contamination  
   Residence time is needed for contamination  
   CFM per person?  
   Wells-Riley equation; exposure time  
   Standardized risk assessment protocol required  
   Potential for the development of a 2-3 pages document and/or a webinar  
   We do not know actually all about coronavirus spread and contamination paths.
8.  Program Update

a.1 Upcoming Winter Meeting in Chicago
   a. James Bennet will chair the MTG-ACR subcommittee program
   b. Program
        Phil Naughton accept to be the session chair for this seminar.
        Potential speakers: Kishor, Jim, Traci Hani
      ▪ Debate: Is Air Change per Hour (h⁻¹), cfm/ft², or Something Else?
        James Bennett, Joe Zulovich, Travis English, Dan Koenigshofe
   c. for the annual meeting, send ideas to James

9.  Research Update

9.1 RP 1833-Literature Review for Evidence of the Basis for Specified Air Change Rates (ACR) for Cleanrooms, Laboratories, Laboratory Animal Facilities, and Health Care Facilities with medium to high ACR. Phil Naughton and Roger Lautz reported on this research project.
   6 months delay at no cost will be accepted.
   Task 1 will be updated at the end of the research project.
   **Ehsan Mousavi and Fred Betz** presented what they are doing actually
   Understanding of the terms
   Basis of ventilation rates specifications
   A new approach will be taken for the literature review for old documents
   Look at prescriptive vs performance
   ACH is convenient and simple
   ACH definition in 1964 by T.W. Kethley
   Phil Naughton refers to ASHRAE handbook of 1938
   They looked in references of references of references to find documents.
   They developed a complex tool to show there methodology

9.2 Volunteer internal research project-ACR and Space Volume (Tom, Cliff, Kishor)
   • A lot of data produced
   • Some results are not conclusive
   • Cliff and Kishor will continue to dig into the results.

10. New Research

   Work Statement should be developed for the following two topics. Kishor will contact members individually to see how members could collaborate to the effort.

10.1 Group I (Roland, Yussuf and Kishor, plus....)
   • An effort to be done to try to combine the 4 objectives in one.
10.2 Group II (Jim Coogan, Ken Mead, plus....)

- Which definition correlates best: ACH, CFM per square-foot, per person, per animal?
- By CFD simulations? By testing?
- Quantify contaminants rate
- Modeling assumptions
- A works statement to be developed

10.3 Final Outcome

- Based on the above evaluations publish the evaluations of the existing ACH specifications in the current ASHRAE guidelines and standards.
- Develop recommendations for appropriate units for the specification of dilution airflow rates.

11. **Travis English presentation Power Point presentation**

- Travis presented numerous tests that he did to analyze the decay rate in different rooms.
- He made tests with hair spray, Carbon dioxide and salt water.
- Purge mode vs diffusion mode
- Steady state conditions.

11. **No old business**

No old business

12. **New Business**

No new business

11. **The meeting adjourned at 13:16 pm.**