**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.)

<table>
<thead>
<tr>
<th>TC/TG/MTG/TRG No.</th>
<th>TC 9.03</th>
<th>DATE</th>
<th>June 28, 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>TC/TG/MTG/TRG TITLE</td>
<td>Transportation Air-conditioning</td>
<td></td>
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<tr>
<td>DATE OF MEETING</td>
<td>June 27, 2016</td>
<td>LOCATION</td>
<td>St. Louis, MO</td>
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<table>
<thead>
<tr>
<th>MEMBERS PRESENT</th>
<th>YEAR APPTD</th>
<th>MEMBERS ABSENT</th>
<th>YEAR APPTD</th>
<th>EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE</th>
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<tbody>
<tr>
<td>Richard Fox (chair)</td>
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<tr>
<td>Byron Jones (Vice Chair)</td>
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<tr>
<td>Jerome Johnston (Sec)</td>
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<tr>
<td>Andreas Bezold</td>
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<td>Kevin Glover</td>
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<tr>
<td>Ken Hesser</td>
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<tr>
<td>G.D. Mathur</td>
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<tr>
<td>James Bushnell</td>
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<tr>
<td>Paul Lebbin</td>
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</table>

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

<table>
<thead>
<tr>
<th>TAC Section Head:</th>
<th>Krishnan Gowri</th>
<th><a href="mailto:SHx@ashrae.net">SHx@ashrae.net</a></th>
<th>Where x is the section number</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters (Research, Standards, ALI, etc.)</td>
<td></td>
<td>See ASHRAE email alias list for needed addresses.</td>
<td></td>
</tr>
<tr>
<td>Mike Vaughn, Manager Of Research &amp; Technical Services</td>
<td></td>
<td><a href="mailto:MORTS@ashrae.net">MORTS@ashrae.net</a></td>
<td></td>
</tr>
</tbody>
</table>
Meeting Attendance
Includes everyone that attended TC 9.3 and any of the subcommittee meetings. The GPC 23 committee meeting is incorporated into the TC 9.3 Rail Subcommittee meeting. Membership designation shown below relates only to TC 9.3 and does not reflect GPC 23 membership.

Byron Jones  Kansas State Univ.  jones@ksu.edu  voting member
Jim Bushnell  HVAC Consulting Svs  jbushnell@roadrunner.com  voting member
Ken Hesser  LTK Engr. Services  khesser@ltk.com  voting member/rail
Hugh Ferdons  Sutrack  hferdons@sutrackusa.com  guest
Donald LaBlanc  NRC Canada  don.leblanc@nrc.ca  incoming member
Pavel Doubek  Thermo King  pavel_doubek@eu.irco.com  guest
Lovenzo Cremaschi  Auburn Univ.  lovenzo.cremaschi@auburn.edu  guest
Andreas Bezold  Airbus  andreas.bezold@airbus.com  voting member/rsch
G.D. Mathur  Nissan/Calsonic  gd_mathur@ck-mail.com  voting member/auto
Len Duello  Georgia-Pacific  len.duello@gapac.com  guest
Jef Gatlin  Thompson Engineering  rlg@ashrae.net  RAC Liaison
Suzanne LeViseur  Haddad Engineering  sleviseur@haddadeng.com  Handbook Liaison
Terry Crawford  Siemens  terry.crawford@siemens.com  guest
Garrett Mann  Kansas State Univ  gmann@ksu.edu  guest
Drew Turner  Danfoss Turbocor  drew.turner@danfoss.com  guest

Call to Order

Meeting was called to order by Vice Chair Byron Jones at 2:15 p.m., June 27, 2016. It was determined that 5 of the 9 voting members were present so quorum requirements are met and the committee can conduct official business.

It was also noted that Donald LaBlanc, NRC Canada is coming onto the committee as a voting member after the present meeting. Paul Lebbin, NRC Canada, will be going off of the committee.

Approval Minutes

The minutes of the January 25, 2016 meeting were corrected as follows:
The report near the end of the minutes listed as Aviation Subcommittee is corrected to read Rail Subcommittee.
The corrected minutes were approved by voice vote.

Standards Report

Guideline 23 has been published. GPC 23 has requested for the guideline to go on continuous maintenance.

STD 161 continues with small changes through addenda
Automobile Committee Report (Chaired by G.D. Mathur)

There were only two people present including subcommittee chair Mathur. There was discussion about the developments to replace R-134a with HFO refrigerant. There was discussion of the need for an air quality standard for automobiles (and possibly other ground transportation). G.D. Mathur will gather information that may drive a standard and will distribute it to the committee prior to the January meeting. The committee can then make an assessment of the need at that meeting.

Old Business

There was no old business.

The TC 9.3 meeting recessed for subcommittee meetings and then reconvened.

Research Subcommittee Report (Chaired by Andreas Bezold)

A progress report was received from Battelle for 1272-RP. The latest schedule is that the final report will be submitted in August of 2016 and there will also be a paper for the January 2016 meeting.

There was discussion of a research project to monitor environmental conditions (CO, CO2, Temp, Humidity, and perhaps others) in rail transportation vehicles. Donald LaBlanc with initiate the development of an RTAR.

There was discussion of the need for a research project to look at particle sensors for use in detecting bleed air contamination in support of Standard 161. Byron Jones may initiate a RTAR for that topic.

Andreas Bezold gave an update on several EU projects related to aircraft. General titles are as follows:

- Adaptive ECS
- In Flight Air Quality Monitoring
- Toxicology Related to Engine Oil (2 projects)
- Technologies to Safeguard and Improve Air Quality

These projects are typically funded at a level of sever million Euros each.

Handbook Subcommittee Report (Chaired by Andreas Bezold)

Liaison Suzanne LeViseur briefed the committee on the use of the new author’s portal that can be used to allow multiple members to work on handbook chapters simultaneously.

We need to keep Suzanne informed as to how much change we anticipate for each chapter. If we do not plan on changing a chapter, we need to also so inform her.

Each chapter was discussed briefly.
There had been some confusion on the aircraft chapter during the last edit. It was agreed that Jerome Johnston would be informed of what happened and he can work with his Boeing colleagues to see what updating might be needed.

The chapter most in need of updating is the ships chapter. However, there is no active member in that area right now. There is a need to identify one or more people to take on this task.

It was agreed that each subcommittee would take a look at its chapter prior to the next meeting and identify what changes are needed.

It was also noted that the online version of the Handbook is available to all ASHRAE members.

**Rail Subcommittee**

As noted above, GPC 23 serves as the Rail Subcommittee. No action items for TC 9.3 were identified other than those that have been included in the research report above.

**Ship Subcommittee**

There was only one person, a guest, that showed up for the Ship subcommittee. Thus, there is no report for this subcommittee.

**Aviation Subcommittee**

There was only one person, a guest, that showed up for the Aviation subcommittee. Thus, there is no report for this subcommittee.

**New Business**

Given the minimal activity of the automobile, aviation, and ship subcommittees, there was a consensus (no vote) that there was no need to schedule separate sessions for them at future meetings unless there is a reason to expect much higher levels of activity. Since the Handbook and the Research subcommittees included everybody, there was a consensus they should just be part of the whole TC meeting. Thus, the only need for a separate subcommittee meeting is for the rail subcommittee which will also be the GPC 23 meeting.

**Adjournment**

The meeting was adjourned at 6:00 p.m.

Minutes recorded by Byron Jones