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>DATE</th>
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<tbody>
<tr>
<td>5.1. Fans</td>
<td>2/12/2015</td>
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<table>
<thead>
<tr>
<th>TC/TG/MTG/TRG TITLE</th>
<th>DATE OF MEETING</th>
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<tbody>
<tr>
<td>Fans</td>
<td>26 Jan 2015</td>
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<table>
<thead>
<tr>
<th>LOCATION</th>
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<tr>
<td>Dearborn Room</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>See Attached Sheet</td>
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DISTRIBUTION

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

<table>
<thead>
<tr>
<th>TAC Section Head:</th>
<th>Kenneth Peet</th>
</tr>
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<tbody>
<tr>
<td>TAC Chair:</td>
<td>Eric Adams</td>
</tr>
<tr>
<td>All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters:</td>
<td>Research – Ricardo Esbri Standards – Rick Larson Hand Book – Annette Dwyer</td>
</tr>
<tr>
<td>Manager Of Standards Manager Of Research &amp; Technical Services</td>
<td>Stephanie Reiniche Mike Vaughn</td>
</tr>
</tbody>
</table>
TC 5.1, Voting Members Present

Patrick Chinoda – Chair 2014
Franco Cincotti – Vice Chair 2014
Asesh Raychaudhuri – Program S/C Chair 2012
John Murphy – Standard S/C Chair 2012
Mike Brendel 2012
John Cermak 2014
Chuck Coward 2014
Harold Dubensky 2014
Rad Ganesh 2011
Tim Kuski 2014
Eric Tingloff 2014
Greg Wagner 2012
Craig Wray 2014

TC 5.1, Voting Member Absent

David Rasmussen 2012

Additional Attendance

Joseph Brooks -- Secretary
Brent Fullerton – Webmaster
Brian Reynolds – Research S/C chair
Zhiping Wang – Handbook S/C Chair
Peter Bushnell
David Carroll
Jay Eldridge
Michael Feuser
Jay Fizer
Armin Hauer
Sanaee Iyama
Sam Jasinski
Igor Maerski
Tim Mathson
Dustin Meredith
Nazme Mohsina
Robert Smith
Wade Smith
Mark Stevens
James Sweeney
Bob Valbracht
Curt Wenger
Mike Wolf
1. **Call to Order – 4:23 pm**

The Chair, Patrick Chinoda, called the meeting to order at 4:23 pm.

2. **Roll Call**

The following voting members were present:

- Patrick Chinoda – Chair
- Franco Cincotti – Vice Chair
- Asesh Raychaudhuri – Program S/C Chair
- John Murphy – Standard S/C Chair
- Mike Brendel
- John Cermak
- Chuck Coward
- Harold Dubensky
- Rad Ganesh
- Tim Kuski
- Eric Tingloff
- Greg Wagner
- Craig Wray

David Rasmussen was not present.

A quorum was present (13/14)

3. **Adoption of Agenda**

Motion TC5.1-01-2015

Moved by: John Cermak
Seconded: Franco Cincotti

“To approve the agenda with section renumbering.”

Passed unanimously

4. **Approval of the Minutes**

Motion TC5.1-02-2015

Moved by: John Cermak
Seconded: Asesh Raychaudhuri

“To approve the minutes from the 30 June 2014 meeting held in Seattle Washington as previously transmitted.”

Passed unanimously

5. **Items of business**

5.1 **TC 5.0 Section Head/Liaison Reports**
The Section 5 section head, Ken Peet, briefed the committee on several items of interest. He described a new initiative that would encourage the presentation of topics of interest to the committee during the TC committee meeting. ASHRAE would provide a room large enough to handle the expected attendance, and would include the announcement of the topic with the other technical session announcements. Other information from the Sunday morning section meeting were reported by the chair in his report.

5.2 Chairman's report
The chair reported on activities noted from the section head meeting. Winners of several ASHRAE awards were announced. For next year, Hightower award nominations are due on 5 Sep 2015. The ASRHAE Code of Ethics was also reviewed.

The chair also described the desire of ASHRAE for Technical Committees to hold seminars or webinars at its TC meetings and the Continuing Education Credit may also be available for those participating.

Waiving the fees for speakers was also presented as a future possibility.

The chair asked committee members to update their bio’s on the ASHRAE website, with special emphasis on their discipline. Members were also encouraged to volunteer as reviewers for technical papers. The chair also passed on a request from TC 2.6 asking for some members of TC 5.1 to review some guidelines sections.

Solicitation for ASHRAE Learning Institute (ALI) were made. A suggestion of a course on fan selection was noted.

Action Item: The ASHRAE Code of Ethics will accompany the agenda for future meeting.

5.3 Old business


This MTG was disbanded. Craig Wray, vice chair of this MTG, discussed some of the successes of the MTG over its lifetime.

6. Subcommittee reports

6.1 Standards subcommittee – John Murphy

6.1.1 ASHRAE Standard 87.3-2001 (RA 2010)
This standard was recommended for withdrawal and, previously, the committee decided that they would like to see the material in a documents other than a standard.

6.1.2 ASHRAE Standard 149
This standard was reaffirmed without change.

6.1.3 ASHRAE 68/AMCA 330
Tim Mathson, chair of this joint standard review committee, reported that the standard was withdrawn and AMCA may pursue identical adoption of ISO 5136.

6.1.4 ASHRAE 51/AMCA 210
Tim Mathson, chair of this joint standard review committee, reviewed the two major changes and reported that a small amount of work is needed and will be complete soon and then the committee will be balloted for its approval.

6.2 Handbook subcommittee – Zhiping Wang
Zhiping Wang reviewed the history of revisions to the Handbook made by this committee. He summarized the four major changes of the current revision were:
• Rewording in Table 1
• FEG/FMEG section
• Field testing section
• Parallel and serial fan operation.

New content for the draft should be back to Zhiping by 1 March 2015. The subcommittee will meet in March and it is hoped that a letter ballot will be sent to the Technical Committee in early April.

6.3 Research subcommittee – Brian Reynolds
See attached report.

6.4 Program subcommittee – Asehs Raychaudhuri
Deadline for seminar and forum submittals is 9 Feb. for Atlanta.

Action: Tim Mathson will contact Steve Idem and possibly put together a program for Orlando on fan selection and system interfaces.

Rad suggested a seminar for Orlando.

A DOE/FER/Efficiency forum for Atlanta was suggested.

May also consider a DOE fan regulation status type of presentation in Orlando.

It was also noted that ASHRAE would sponsor a webinar in between meetings.

7. FAQ -- John Murphy
No questions received. It was suggested that this agenda item be removed from future agendas.

8. Website Report – Brent Fullerton
The webmaster, Brent Fullerton, presented TC 5.1 Web Analytics. Brent has been the webmaster for over ten years and asked if there were any volunteers to take this position.

9. New Business
Franco Cincotti suggested that this committee hold presentation similar to what TC 2.6, Sound and Vibration, does for “Hot Topics.”

10. US DOE Fan Regulation and Fan Efficiency Ratio
Wade Smith, AMCA International Executive Director, reported on the status of negotiations with the US Department of Energy (US DOE) to regulate fans. In the same presentation, Tim Mathson described a new metric that could be used by the DOE in its regulation.

11. Time and Place of Next Meeting
The next meeting will be held in conjunction with the summer Annual Meeting of ASHRAE held in Atlanta, GA. [On Monday afternoon at 4:15 pm.] It was noted that we will request a larger room.

12. Adjournment
Motion TC5.1-03-2015 Moved by: Tim Kuski
Seconded: Franco Cincotti
“To adjourn.”

Passed unanimously

The meeting was adjourned at 6:46 pm.

Minutes recorded by:

Joseph A. Brooks, PE

Attachments: 1.) Research Subcommittee Report
Notes from Research Subcommittee Chairs Meeting

- New Section 5 Research Liaison – David John  
  djohn@adehvac.com
  - Will change later to using a ‘drop box’ for email
- RL status sheet – P.I. still needs to provide TP draft to earn final payment. Contract payments 5 of 6.
- 4 RTARS evaluated, 3 conditionally accepted
- 8 WS’s evaluated, 5 conditionally accepted
- 6 TRP’s were approved for bid
- 59 active Research projects
- TC Research voting
  - Quorum needed to conduct business
  - 2/3 of voting members needed for approval of RTAR’s, WS,s, and Research Reports
- The liaison is our advocate at RAC. It is important for the liaison to understand the RTAR (or WS).

RP’s

- RP 1420, RP 1216 – Seminar 28, System Effects from Inlet of Centrifugal and Plenum Fans
- No active Work Statements

RTAR’s in progress or proposed

1. Experimental Evaluation of the Efficiency of V-Belt Drives used on Fans
   - Received some liaison comments, updated for Chicago
   - Reviewed in subcommittee meeting
   - Is the TC ready to vote to approve the RTAR? Or distribute for review & letter ballot (or Atlanta).
   - What about review by SME’s outside of ASHRAE?
   - Then send for liaison review
2. Series & Parallel fans system effects (Patrick Chinoda) – Will approach TC 5.2 (Duct design). Could be a joint proposal.

Possible Research Topics

Suggest ranking (H, M, L)
RTAR Author?

1. Fan load profile data (Tim Kuski, Michael Ivanovich, Craig Wray). Would help DOE.
   Discussion in NYC.
   - Tim met with David Wiggins (Newcomb & Boyd) to discuss the database
   - Tim to review the database & report to TC.
   - Then decide about an RTAR.
2. Develop Method of Test (MOT) for Large Circulating Fans – coordinate with TC 5.3 and AMCA 230.
   - SPC 216 is working on MOT for determining application data of overhead fans.
   - DOE is looking at it.

3. Develop criteria for improving the design of flow settling means utilized in multi-nozzle chamber performance testing defined in AMCA standard 210/ASHRAE standard 51.
   - Research would be to help people design better airflow measuring chambers.
   - See what happens in a future revision of AMCA 210. Not ready for an RTAR.
   - Limited audience, manufacturer specific.

4. Round robin test program to establish the accuracy of AMCA 300 tests.
   - Might remove from list pending round robin conclusions from AMCA
   - Staff has almost completed analysis for presenting to AMCA Fan committee.
   - Data needs to be analyzed outside of staff, sanitized
   - AMCA members have already paid for the cost.

5. Fan outlet discharge effects would be the next logical step for future research projects?
   - RP 1420 (plenum) includes discharge effects.
   - ‘Discharge effects are not fans business’. This is a connections issue.
   - Mark Stevens (& Alan Guedel) have some information. Joint.

6. Develop practical process to determine velocity pressure. Accurately determine the energy flux leaving the fan.
   - Project should measure outlet velocity profile. But that is difficult to measure.
   - Possible program to predict the outlet velocity profile of a fan. Obtain data for validation. Need an estimate for cost of the analysis. Could lead to a prediction tool.
   - Could improve how fans are designed or applied.
   - CFD may be able to do this for axial fans (without research)
   - Centrifugal – joint experimental (for validation) & CFD
   - Target audience would be the fan designer.
   - Axial is predictable today.

7. Develop method for testing/rating/comparing air curtains (on MTG list)
   - Coordinate with TC 5.3 and AMCA.
- Air curtain companies hired an expert CFD consultant at university to write a report by end of 2015. Then decide next step. It is a code issue. TC 5.3 (Room Air Distribution) is the sponsor.
- Check back later in the year. Could be a good joint project.
- WG 9 is developing a technical report on energy effectiveness of air curtains impact on other AC.
- An RTAR will be presented to TC 5.3 for Atlanta. TC 5.1 could be joint sponsor.

<table>
<thead>
<tr>
<th>Ranking</th>
<th>H, joint RTAR Author?</th>
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<td>TC 5.3</td>
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8. Fan stall research (on MTG list)

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9. Fan efficiency effects and/or fan predictability effects at low-flow/low-speed operation?
- MTG List

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10. Effect of impeller tip clearance on performance (added in NYC)

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12. Fan Curve Fitting Development-Technique and curve models for axial and centrifugal fans. (Greg Sanchez)
This research will evaluate a selective number and sizes of fans using data collected from manufacturers to develop the fan performance curve, which may include stalling. Then curve fit the performance curve and develop a model (equation) that would represent this measured data. I find this information to be supplemental to the ideal graphical representation shown in Figure 1 of the handbook. We will of course need to disclose the detail information of the fan in regards to dimensions, layout, power, pressure, airflow.

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14. Parallel/series jet fans (Greg Sanchez)

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**Added in Chicago**

12. Plenum fan wall research
- from the AMCA plenum fan array committee
- Damper inlet and outlet system effect on fan arrays.
13. Fan performance & efficiency with VFD at low turn down ratio
15. VFD and motor efficiency (came from MTG list)
- Supports AMCA 207
16. Effect of inlet system effects on piezo ring accuracy
17. Fan Sound & vibration topics
   • Tone prominence
   • Tools to predict off peak efficiency

Other Fan research ideas? Or send ideas to TC 5.1 Research Chair (Brian Reynolds)
New section 5 liaison (Ricardo Esbri), 4 year term
Liaison can attend TC meeting or subcommittee meeting on request