

AMERICAN SOCIETY OF HEATING REFRIGURATION AND AIR-CONDITIONING  
ENGINEERS, INC.  
1791 Tullie Circle, N.E./ Atlanta GA 30329  
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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.)

TC/TG/MTG/TRG No. 6.10 DATE 2/3/13  
TC/TG/MTG/TRG TITLE FUELS AND COMBUSTION  
DATE OF MEETING 1/29/13 LOCATION Dallas TX

MEMBERS PRESENT	MEMBERS ABSENT	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Bill Roy (VM – Chr)	David Bixby (CM)	Marko Bruinsma (G)
Larry Brand (VM)	Paul Glanville (CM)	Craig Grider (G)
Tom Butcher (CM – V.Chr, prg)	Hall Virgil (VM)	Steve Hancock (L/Research)
Shamel Kassab (VM)	Justin Westmoreland (CM)	David Herrin (G – Rsch. Contractor)
Jennifer Guerrero- Ferreira (CM-hb)		Jonathan Kane (G)
George Kusterer (VM)		Nicolas Lemire (L/Handbook)
Thomas Neill (CM)		Anuj Mistry (G)
Earl Rightmier (CM – rsch.)		Raymond Westers (G)
Paul Sohler (VM-Sec.)		Dave Wheaton (G)
Cory Weiss (VM)		
Aykut Yilmaz (CM)		

Key: CM = Corresponding Member, G = Guest, L = ASHRAE Liaison, IM = International Member

Distribution

ALL MEMBERS OF THE TC/TG/TRG

TECHNICAL ACTIVITIES COMMITTEE CHAIRMAN: Craig Wray ([TACchair@ashrae.net](mailto:TACchair@ashrae.net))

TAC SECTION HEAD: John Dunlap ([JDunLap@DunLappartners.com](mailto:JDunLap@DunLappartners.com))

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Program: Lane Jackins ([PL6@ashrae.net](mailto:PL6@ashrae.net))

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MANAGER OF RESEARCH: Michael Vaughn ([MORTS@ashrae.net](mailto:MORTS@ashrae.net))

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These draft minutes have not been approved and are not the official, approved record until approved by this committee

## ASHRAE TC 6.10 Meeting Minutes

Date: January 29<sup>th</sup>, 2013

Location: Dallas, TX

Chair: Bill Roy

- 1) Call to Order – Meeting was called to order at 3:31 PM
- 2) Quorum Determination – Five of seven voting members were present at the beginning of the meeting (a sixth arrived later), so a quorum was established.
- 3) Review and Approval of Minutes – The secretary summarized the minutes of the June 26<sup>th</sup> meeting in San Antonio. The motion was then approved by a 5-0-0 vote. Following this vote, Mr. Kusterer complimented the Secretary for promptly getting minutes out to the TC and requested that his comment be included in the minutes.
- 4) Approval of Agenda - The TC voted to approve the agenda as distributed by Mr. Roy prior to the meeting by a 5-0-0 vote.
- 5) Liaison Reports – The following reports from other committees were presented:
  - a. Research - Steve Hancock (Research Liaison) provided the following updates:
    - i. Mike Vaughn is still looking for a project “Disposition of Research Form” to close out RP1388 (High Altitude Boiler and Water Heater Research Project). Mr. Rightmier (Research Chair) promised to complete this form and sent it to Mike Vaughn.
    - ii. Mr. Hancock noted that the TC needs to approve the final draft of the research report. Dr. Herrin indicated that the final draft of the report (including corrections suggested by the PMS) will be sent to the PMS in the near future for approval prior to a general approval by the TC.
  - b. Handbook – Mr. Lemire reported that the TC is scheduled to review Chapters 31 (Automatic Fuel Burning Systems) and 35 (Chimney, Vent, and Fireplace Systems) in *HVAC Systems and Equipment* in accordance while following schedule:
    - i. Identify sections of chapters that need updating by the spring 2013 meeting in Denver.
    - ii. Have revisions mostly finished by the January 2014 meeting in New York.
    - iii. Vote final approval by January 2015 meeting.

Mr. Roy announced that Ms. Guerrero-Ferreira has volunteered to replace Mr. Weiss as Handbook chair.

Dr. Butcher asked about the continuing need for hard copy versions of the handbooks. Mr. Lemire responded that there is still a demand for printed handbooks as well as handbooks on CDs.
- 6) Research –Dr. Herrin of the University of Kentucky provided an update on the status of RP1517 (Combustion Driven Oscillations in Boilers). Dr. Herrin reported that the following key conclusions have been reached:
  - i. A low order feedback model using equivalence ratio has been identified in addition to the original model which used air-fuel mixture flow.
  - ii. A method was proposed and validated for measuring burner impedance.

- iii. Acoustics of the burner tube itself may be important in predicting combustion driven oscillation, particular when this oscillation occurs at frequencies in excess of 600Hz (internal burner acoustics were not considered in original modeling).
- iv. Dr. Herrin felt that it would be useful to apply these models to appliances that are simpler from an acoustical standpoint, citing water heaters and furnaces as examples.

Dr. Butcher asked about the application of this research to a tool that appliance designers can use to predict and/or solve combustion driven oscillation problems. Dr. Herrin noted that, while modeling appliance acoustics is relatively straight forward at frequencies below 700Hz, identifying the flame transfer function for a given burner is still quite difficult. For this reason, he does not think that use of the full model is yet practical for most users. Dr. Butcher and Mr. Sohler suggested that Dr. Herrin consider development of a flow chart that could be used by appliance designers to reduce the need for application of the full model (for example, by helping the user to identify quarter wave tubes in the appliance design).

The TC briefly discussed a follow-up research project to RP1517 which would likely focus on combustion driven oscillation in water heaters. Mr. Rightmier agreed to draft a work statement for this project.

7) Other Business – George Kusterer outlined concerns that he (and others) have identified with portable combustion analyzers currently in use in the field:

- Service Technicians have no good way to choose combustion analyzers
- While the use of combustion analyzers is required by NFPA-31, and other standards, they are often not used.
- Mr. Kusterer reported checking several different combustion analyzers on the same appliance and achieving widely different results leading him to conclude that no construction standard exists for combustion analyzers.
- Liability for any injuries resulting from the use of a faulty combustion analyzer to adjust an appliance lies solely with the service technician.
- My Kusterer noted that while AHRI has developed a performance standard for combustion analyzers, he is concerned that this standard has been developed with insufficient input from end users.

Mr. Bruinsma, chair of the AHRI Gas Detection & Analysis Section, generally agreed with the concerns raised by Mr. Kusterer. He also noted that many of the calculations used by analyzer to compute values such as efficiency are inconsistent between analyzer manufacturers. Mr. Bruinsma noted the AHRI standard is merely a first step which defines basic measurement performance for analyzers. The first draft of this standard is expected to be complete by the end of the first quarter of 2013.

Mr. Kane, another member of the AHRI Gas Detection & Analysis Section, commented that it will ultimately be up to appliance manufacturers to provide guidance for the use of portable combustion analyzers and the interpretation of the readings that they provide.

After further discussion it was agreed that the short term role for the TC was to sponsor a program on combustion analyzers at an upcoming ASHRAE meeting (see Programs below).

Programs – DR. Herrin reported that he has submitted two technical papers to ASHRAE based on the work done as part of RP1517. After some discussion, Mr. Roy agreed to approach the TAC Chair to see if we can get these two (and possibly a third) papers presented in Denver.

In follow-up to the discussion on portable combustion analyzers reported above, the TC agreed to propose two seminars for the January 2014 meeting in New York. These two presentations would be prepared by the AHRI Analyzers and Analysis Section and would cover the following topics:

- The status of the AHRI portable combustion analyzer standard and what this standard covers.
- Current requirements in Europe for the use of combustion analyzers.

It was agreed that proposals for these seminars would be passed through Dr. Butcher. Mr. Kusterer agreed to chair these seminars.

Dr. Butcher commented that it might be possible for him to prepare a seminar on alternate fuels for the New York meeting. He also said that it might be possible to arrange a visit to Brookhaven Labs during the New York meeting. The TC suggested that this visit be scheduled for Wednesday.  
(Secretary's note: deadline for abstracts for New York program is 3/15/13).

- 8) Website (<http://tc610.ashraetcs.org/>). – Tom Butcher reported that he has been unable access the TC's website in order to update it and that he will contact Mike Vaughn to find out why.
- 9) Standards – No report.
- 10) Membership – Mr. Roy reported that he will change Mr. Virgil's status to non-quorum. In addition, Mr. Roy indicated that he would purge the roster of members who have not attended in some time and/or who are known to have left the industry.
- 11) Adjournment – Meeting was adjourned at approximately 6:00PM

Respectfully Submitted,

Paul Sohler  
Secretary