

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.
 1791 Tullie Circle, NE / Atlanta, GA 30329
 404-636-8400

TC/TG/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/TRG No. 8.11 Date June 26, 2006
 TC/TG/TRG TITLE: Unitary and Room Air Conditioners and Heat Pumps
 DATE OF MEETING: June 26, 2006 LOCATION: Quebec City, Canada

ATTENDANCE

MEMBERS PRESENT	Committee Position	Term End Date
Jason T LeRoy	CHAIRMAN/MBR	06/30/05
Sivakumar Gopalnarayanan	VICE CHAIRMAN/MBR	06/30/07
Gregory J Rosenquist	SECRETARY/MBR	06/30/06
Hugh I Henderson Jr	PROGRAM SUBCOM CHM/MBR	06/30/06
Eckhard Achim Groll	ALI COORDINATOR/MBR	06/30/07
Robert B Uselton	MEMBER	06/30/09
Byron F Horak	MEMBER	06/30/09

EX-OFFICIO MEMBERS & ADDITIONAL ATTENDANCE*		
Michael Vaughn	NON-MEMBER (TECH SERVICES STAFF LIASON)	
Piotr A Domanski	CORRESPONDING MEMBER	
Stephen S Hancock	CORRESPONDING MEMBER	
Don Schuster	CORRESPONDING MEMBER	

* All ex-officio members and guests in attendance not listed.

MEMBERS ABSENT	Committee Position	Term End Date
Ramez Afify	HANDBOOK SUBCOM CHM/MBR	06/30/09
Brian P Dougherty	STANDARDS SUBCOM CHM/MBR	06/30/07
Darin W Nutter	TC WEBMASTER/MEMBER	06/30/07
Sarah A Medepalli	MEMBER	06/30/07
Russell C Tharp	MEMBER	06/30/06
Man-Hoe Kim	INTERNATIONAL MEMBER	06/30/07

SUBCOMMITTEE CHAIR/CM ABSENT	Committee Position	
Mark Spatz	RESEARCH SUBCOM CHM/CM	

DISTRIBUTION
ALL MEMBERS OF TC/TG/TRG

TAC Chairman: _____ Eckhard Achim Groll
TAC Section Head: _____ Bryan Becker
LIAISONS:
RAC Research: _____ Ronald Bailey
Journal: _____ Branislav B Todorovic
Program: _____ Lynn Werman
Standards: _____ Stephen Skalko
Handbook: _____ Ron Davis
MANAGER OF TECHNICAL SERVICES: _____ Michael R Vaughn
MANAGER OF RESEARCH: _____ William Seaton
STANDARDS STAFF LIAISON: _____ Claire Ramspeck
TECH SERVICES STAFF LIAISON: _____ Michael R Vaughn

MINUTES
ASHRAE TECHNICAL COMMITTEE 8.11
UNITARY AND ROOM AIR CONDITIONERS AND HEAT PUMPS

QUEBEC CITY, CANADA
MONDAY, JUNE 26, 2006

I. CALL TO ORDER

The Chair called meeting to order at 4:20 pm.

II. INTRODUCTIONS

All present (voting members, corresponding members and guests) introduced themselves.

III. DETERMINATION OF A QUORUM

Seven voting members were present (Jason LeRoy, Sivakumar Gopalnarayanan, Hugh Henderson, Greg Rosenquist, Robert "Dutch" Uselton, Eckhard Groll, and Byron Horak). Quorum established. (Note: Quorum was not achieved until Byron joined meeting during the Research Subcommittee report.)

IV. ANNOUNCEMENTS

The Chair, Jason LeRoy, made the following announcements:

- Jason LeRoy is rolling off as Chair following the Quebec City meeting. Sivakumar Gopalnarayanan (Siva) will be taking over as Chair.
- Volunteers are being sought on ASHRAE's energy position document. Interested people should contact Mike Vaughn or Eckhard Groll.
- Technical questions regarding the Solar Decathlon Competition are being sought. Technical questions should be submitted in 2006-07 timeframe.
- Call for Abstracts:
 - IAQ 2007 conference in Baltimore.
 - CLIMA 2007 conference which is co-sponsored by ASHRAE. Deadline for submissions is October 15th.
- ASHRAE Program Themes:
 - Dallas 2007 Winter Meeting: *Energy Efficient Building Design*.
 - Long Beach 2007 Summer Meeting: *Natural Resource Utilization for HVAC Systems*.
- Letters of appreciation from ASHRAE are available for members needing it.
- Strategic plan being developed.
 - The plan should drive TC activities on Standards, Program, and Research.
- New ASHRAE website is being introduced July 1st. Google-based search engine is being added.

- ASHRAE is spearheading a new Handbook initiative:
 - Meeting was held on Sunday, June 25th. Stated goals are to improve communication, flexibility, and uniformity across all four handbooks.
 - Current review of Fundamentals handbook being conducted. Goals are to: (1) connect to relevant ASHRAE publications; (2) balance references to facilitate every day use; (3) promote out of book thinking for world-wide use; and (4) make navigation more logical.
 - There are on-going discussions as to how to make the handbook more accessible to non-engineers. The TC expressed some concern over this matter, i.e., the handbook is intended for engineers and should be “dummied down” for non-engineers.
- Research activities at ASHRAE:
 - ASHRAE is encouraging coordination on research activities between TCs.
 - Work ongoing to develop baseline homes for which to evaluate potential research.
 - TC 8.11 has a couple of research activities that is coordinating with two other TCs (discussed later in Research Subcommittee report).

V. ADDITIONS TO THE PUBLISHED AGENDA

Agenda addition to research subcommittee: Co-sponsorship of a project on 4-way valves.

VI. LIAISON REPORTS FROM OTHER COMMITTEES

TECHNICAL SERVICES

Michael Vaughn, Tech Services Staff Liaison, noted the following:

- ASHRAE needs information specific to mini-splits and requested that the TC dedicate a section to mini-splits in its Handbook chapter. The TC is aiming to write a section for its chapter in the 2008 Handbook. Sivakumar Gopalnarayanan, in-coming Chair, is the lead on this effort. The idea for including a section on mini-splits originated from ASHRAE’s International Chapters.
- ASHRAE is encouraging an effort to publish materials on the selection and maintenance of HVAC systems. A brochure is apparently being developed by TC 9.5, Residential and Small Bldg. Applications. Dutch Useton is designated by the TC to follow-up on TC 9.5’s action.

VII. MINUTES OF PREVIOUS MEETINGS

Motion to approve meeting minutes from the January 2006 Chicago meeting passed 7-0-0. Motion for approval by Ekhard Groll with second by Sivakumar Gopalnarayanan. (Minutes were approved during the Research Subcommittee report after Byron Horak joined the meeting and quorum was achieved.)

VIII. MEMBERSHIP/ROSTER

Don Schuster is to become the new Secretary. Sivakumar Gopalnarayanan will become the new Chair after the Quebec City meeting in June 2006. No Vice Chairman as of yet. The following will be rolling off as members after the Quebec City meeting: LeRoy, Rosenquist, Henderson, and Tharp.

IX. SUBCOMMITTEE REPORTS

NOTE: Rooms for the subcommittees were not reserved for the Quebec City meeting. Incoming Chair needs to make subcommittee meeting room request for the Dallas meeting.

A. PROGRAM COMMITTEE – CHAIR: HUGH HENDERSON

Hugh stated that future seminar program submissions should be classified as *Basic*, *Intermediate*, or *Advanced*. Hugh noted that the following seminar is scheduled for the Quebec City meeting: *Climate Sensitive Air Conditioner Designs* to be Chaired by Greg Rosenquist. The subcommittee met for a short time on Sunday, June 25th and developed the following program ideas:

- Program ideas for Long Beach meeting:
 - Transaction Session on *Part-load Performance*. Possible authors/speakers include: Hugh Henderson, Don Shirey, and Clark Bullard.
- Program ideas for Dallas: None.

Hugh made a request to the TC for future program ideas. The following ideas were brought forth from the TC:

- Seminar: *Basic performance of AC systems*. (Steven Kavanaugh)
- Seminar: *AC designs that have the potential to increase efficiency now that 13 SEER is the minimum standard*. (Piotr Domanski).
- Seminar: *New procedures for mixed/matched systems for the replacement market*.
- Seminar: *Potential problems of contactors replacing heat pumps with gas furnaces*.
- Seminar: *Add-on components/retrofits to AC systems* (e.g., water-heating from heat recovery).
- Forum: TC 8.8 is sponsoring a Forum for Dallas and is seeking co-sponsorship from TC 8.11 on topic of *4-way refrigerant valves*. The intent of the Forum is to generate new ideas to put into an RTAR. Darrin Nutter was identified as a good candidate from TC 8.11 to review any RTAR that TC 8.8 generates.

The TC decided to pursue the following two seminars as its top program priorities for the Dallas meeting:

- Priority #1: Piotr Domanski's idea on *New AC designs now that 13 SEER is the minimum standard*. Potential seminar title is: "What it took to get to 13 SEER and where do we go from here?". Jason LeRoy volunteered to Chair the seminar. Possible speakers include: Eckhard Groll, Piotr Domanski.
- Priority #2: Seminar on *Better installation practices for AC systems*. Greg Rosenquist will serve as Chair.
- Priority #3: Co-sponsorship with TC 8.8 of Forum on *4-way refrigerant valves*.

Motion to approve the above three programs at the TC 8.11's top three program priorities passed on a vote of 7-0-0. Motion for approval by Ekhard Groll with second by Sivakumar Gopalnarayanan. (Program priorities were approved during the Research Subcommittee report after Byron Horak joined the meeting and quorum was achieved.)

B. RESEARCH COMMITTEE – CHAIR: MARK SPATZ

Mark Spatz was not in attendance at the meeting. But the TC did begin a discussion on the following research ideas and proposals that have been discussed or considered over the recent past:

- TC 8.8, Refrigerant System Controls & Accessories, is looking for co-sponsorship from TC 8.11 and/or TC 9.6 on research from 4-way refrigerant valves. Steps proposed by TC 8.8 are to: assemble ASHRAE research; develop Method of Test for determining heat transfer, pressure drop, and mass transfer. It was noted that losses are on the order of 4.6% for based on the use of refrigerants R-410A and R-22. TC 8.8 wants to study a total of four refrigerants. TC 8.8's RTAR was rejected by ASHRAE (two review cycles ago). A new RTAR will not be developed until after the forum that TC 8.8 is sponsoring on the subject for the Dallas meeting.
- RTAR developed by TC 6.3, Central Forced Air Heating and Cooling Systems, and co-sponsored by TC 8.11 entitled *Dehumidification of Residential Buildings in Hot and Humid Climates* got approved by ASHRAE. Now a work statement needs to be developed.
- TC 6.3 also developed another RTAR entitled *Impact of Operating Variables on Capacity and Heating Performance of Heat Pumps* which TC 8.11 is considering co-sponsoring. The TC 8.11 Research Subcommittee suggested revisions to address mis-matched systems. Once the RTAR is revised it will be brought back to the full TC for approval.
- Other research ideas first discussed at the Chicago, January 2006 meeting: Heat Pump "cold blow" problems; and the possible need for test procedure revisions to accommodate larger

equipment that needs to comply with new 13 SEER minimum efficiency standards. In-coming Research Subcommittee Chair Steve Hancock stated that he would look further into both these research ideas and will develop draft RTARs if warranted.

Motion to approve co-sponsoring of TC 6.3's RTAR entitled *Impact of Operating Variables on Capacity and Heating Performance of Heat Pumps* (subject to inclusion of addressing mixed-match systems) passed on a vote of 7-0-0. Motion for approval by Ekhard Groll with second by Hugh Henderson. Jason LeRoy was designated as the liaison to TC 6.3 to ensure that the RTAR would be revised to address mixed-match systems.

Steve Hancock, in-coming Research Subcommittee Chair, stated that he would e-mail members before the Dallas meeting with new research ideas.

C. HANDBOOK COMMITTEE – CHAIR: RAMEZ AFIFY

Ramez Afify was not in attendance at the meeting. Jason Eiling filled in for Ramez and reported on Handbook activities.

- Chapter 1 was e-mailed to members on April 10, 2006. This chapter was voted on approved at the last meeting in Chicago.
- Chapters 45 and 46: revisions are being made for the 2008 Handbook.

D. STANDARDS COMMITTEE – CHAIR: BRIAN DOUGHERTY

Brian Dougherty was not in attendance at the meeting. Byron Horak reported on Standards activities.

Std 116-1995R *MOT for Rating Seasonal Efficiency of Unitary Air Conditioners and Heat Pumps*

SPC Chair: David Tree

SPC Liaison: Hakim Elmahdy

The SPC has completed all revisions. The Standard should be ready for public review by the fall (deadline of August 1st). It was noted that all “shoulds” in the Standard had to be changed to “shalls”. The SPC needs to send a letter ballot to SPC members for review of the Standard.

Std 16-1983 (RA 99) *MOT for Rating Room Air Conditioners and Packaged Terminal Air Conditioners*

SPC Chair: Mark Paquette

SPC Liaison: James Woods

No new report. As reported in the Chicago January 2006 meeting minutes, Standards 16 and 58 will be combined into one standard.

Std 37-2005 *MOT for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment*

No new report. As reported in the Chicago January 2006 meeting minutes, the new revision of Standard 37 received ANSI approval on March 11, 2005 and is now available for purchase.

Std 58-1986 (RA 99) *MOT for Rating Room Air Conditioner and Packaged Terminal Air Conditioner Heating Capacity*

SPC Chair: Mark Paquette

SPC Liaison: James Woods

See discussion provided above under Std 16-1983 (RA99).

Std 137-1995 (RA 2004) *MOT for Efficiency of Space-Conditioning/Water Heating Appliances that Include a Desuperheater Water Heater*

Lead TC: 6.6 (Service Water Heating)

Co-cognizant TC: 8.11

No new report. As reported in the Chicago January 2007 meeting minutes, Standard 137 was reaffirmed in 2004. No action was needed at that time.

Byron made a plea to the TC for more manufacturer involvement on the develop of ISO Standards. Other than this plea, Bryon made no report on the status of ISO Standards. The following report was provided in the Chicago January 2006 meeting minutes on the status of ISO and CEN standards.

**ISO Technical Committee 86 (Refrigeration and Air Conditioning)
Subcommittee 6 (Air Conditioners and Heat Pumps)**

ISO Secretariat: ARI

ISO Std 5151R, Non-Ducted Air Conditioners and Heat Pumps – Testing and Rating for Performance

The current revision was released for a Draft International Standard (DIS) ballot during the latter half of 2005. The ballot, which closed on 12 December 2005, passed with comments being submitted with both positive and negative votes. The convenor of the cognizant ISO TC86/SC6 working group has tentatively planned an editing committee meeting sometime during the last week of March 2006. At this meeting, which will be held at ARI headquarters in Arlington, Virginia, a few working group members will organize the comments and formulate recommendations for consideration by the full working group at its next meeting, tentatively planned for June 2006 .

ISO Std 13253R, Ducted Air Conditioners and Air-to-Air Heat Pumps – Testing and Rating for Performance

Same as stated above for ISO Standard 5151R.

ISO Std 15042P, Multi-Split System Air Conditioners and Air-to-Air Heat Pumps – Testing and Rating for Performance

Same as stated above for ISO Standard 5151R.

ISO Std 13258R, Air-Conditioning Condensing Units – Testing and Rating for Performance

No changes to report since the Denver ASHRAE meeting. The working group is presently on hold awaiting a ballot for reinstatement of the program of work. When reinstated, the working group will consider prEN 13771-2 while revising the document in response to comments received from the CD ballot. The working group will consider a proposed revision to expand the document's scope to include refrigeration condensing units.

ANSI/ARI/ASHRAE/ISO Std 13256 – 1: 1998, Water-Source Heat Pumps – Testing and Rating for Performance, Part 1: Water-to-Air, Brine-to-Air Heat Pumps

This standard has been co-adopted by ASHRAE and ARI and carries ANSI designation. The standard is referenced in ASHRAE Standard 90.1, is used in the ARI certification program, and is available for purchase from ASHRAE. The 1998 standard was reaffirmed by ISO in early 2005.

ISO Std 13256 – 2, Water-Source Heat Pumps – Testing and Rating for Performance, Part 2: Water-to-Water, Brine-to-Water Heat Pumps

See discussion under ISO Standard 13256 – 1.

TC 8.11 Standards Subcommittee Report
2005 Winter Meeting – Chicago

The following status report was provided on CEN TC 117 Standard for Air Conditioners and Heat Pumps.

EN Standard 14511

At the last meeting in Denver, members of the US Technical Advisory Group (TAG) on ISO TC 86 activities were investigating whether CEN was reconsidering revisions to its “umbrella” standard covering HVAC&R, including air conditioners and heat pumps. Whereas EN Standard 14511 presently references other EN standards, TAG members were hopeful that consideration will be given to referencing some ISO standards instead. Following the Denver meeting, ARI's Jim Walters followed up with TAG members to let them know that the revision appears to only apply

to a select few sections of the EN standard. The types of changes sought by the US TAG are not available at this time.

X. OLD BUSINESS

None.

XI. NEW BUSINESS

The IEA Heat Pump Technology Annex on Compact Heat Exchanger Technology requests contributions to the Annex. ASHRAE's contribution will be on microchannel heat exchangers. The U.S. Department of Energy is paying Clark Bullard to be its U.S. representative at the Annex. TC 8.4, Air-to-Refrigerant Heat Transfer Equipment, is the cognizant TC for this activity. But to back up TC 8.4, TC 8.11 discussed the possibility of requesting that ASHRAE fund a special project to co-fund Clark Bullard's trip to attend the Annex. Motion to request that ASHRAE co-fund Clark Bullard's participation in the Annex, which will consist of three trips at a total cost of \$15k, was passed on a vote of 7-0-0. Motion for approval by Jason LeRoy with second by Hugh Henderson.

Doug Kosar of TC 8.12, Desiccant Dehumidification Equipment and Components, reported that ASHRAE has approved a short course for the Dallas meeting on incorporating dehumidification into air-conditioning systems (e.g., heat pipes, desiccant systems). Doug requested a technical reviewer from TC 8.11 on the PowerPoint presentation materials that will be prepared for the short course. Eckhard Groll volunteered to be the TC's reviewer.

XII. ADJOURNMENT

Motion to adjourn by Jason LeRoy and seconded by Hugh Henderson. Motion approved. The meeting adjourned at 6:31 pm.

ASHRAE TC/TG/TRG ACTIVITIES SHEET

DATE: January 24, 2007

TC/TG/TRG NO. 8.11 **TC/TG/TRG TITLE:** Unitary and Room Air Conditioners & Heat Pumps

CHAIRMAN Jason LeRoy **VICE CHAIRMAN** S. Gopalnarayanan **SECRETARY** G. Rosenquist

TC/TG/TRG MEETING SCHEDULE				
<p><u>Location – past 12 months</u> Chicago, IL – Jan 2006 Quebec City – Jun 2006</p> <p><u>Location - next 12 months</u> Dallas – Jan 2007 Long Beach, CA – Jun 2007</p>				
TC/TG/TRG SUBCOMMITTEES				
<u>Function</u>	<u>Chairman</u>			
Standards Handbook Programs Research	Brian Dougherty Ramez Afify Hugh Henderson Mark Spatz			
RESEARCH PROJECTS – Current				
<u>Project Title</u>	<u>Contractor</u>	<u>Reporting Comm. Member.</u>	<u>Report Made At Meeting</u>	
None				
LONG RANGE RESEARCH PLAN				
<u>Rank</u>	<u>Title</u>	<u>W/S Written</u>	<u>Approved</u>	<u>To R&T</u>
1.	RP-1121: Phase 2	YES	YES	Need to contact ARI for joint funding.
HANDBOOK RESPONSIBILITIES				
<u>Year & Handbook Subcommittee Volume, Chapter & Title</u>		<u>Deadline</u>	<u>Liaison</u>	
2008	45	Unitary Air Conditioners and Heat Pumps	Jul 2007	R. Davis
2007	46	Room Air Conditioners and Packaged Terminal Air Conditioners	Jul 2007	R. Davis
STANDARDS ACTIVITIES – List and Describe Subjects				
See Section IX.D. above in minutes.				

TECHNICAL PAPERS from Sponsored Research – Title, when presented	
TC/TG/TRG Sponsored Symposia – Title, when presented (past 3 yrs & planned)	
Refrigerant Issues with Unitary A/C and Heat Pumps	Honolulu 6/2002
Part Load / Cyclic Issues	Dallas 1/2007
TC/TG/TRG Sponsored Seminars – Title, when presented (past 3 yrs & planned)	
Emerging Technologies from ARTI 21-CR	Orlando 2/2005
Climate Sensitive Air Conditioner Designs	Quebec City 6/2006
What System Components Are Used Today in Unitary Air Conditioners, and What Changes Will Get Us to the Next Efficiency Level?	Dallas 1/2007
Installation Issues with Unitary Equipment: What's the Impact and What Can We Do About It?	Dallas 1/2007
TC/TG/TRG Sponsored Forums – Title, when presented (past 3 yrs & planned)	
Role of HVAC Equipment in Satisfying 62.2	Denver 6/2005
Will the new 13 SEER A/C systems be more or less susceptible to field Installation issues?	Chicago 1/2006
Can One Reach Performance Testing Nirvana by Moving from ASHRAE 16 and 58 to ISO 5151?	Chicago 1/2006
Four-way Refrigerant Valves	Dallas 1/2007
JOURNAL PUBLICATIONS – Title, when published (past 3 yrs & planned)	
None known.	

Submitted by: Greg Rosenquist