

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS, INC.  
1791 Tullie Circle, N.E./Atlanta, GA 30329  
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**TC/TG/TRG MINUTES COVER SHEET\*\*\***

(Minutes of all TC/TG/TRG Meetings are to be distributed to all persons listed below within 60 days following the meeting.)

TC/TG/TRG NO.: T.C. 6.7 DATE: March 15, 2006

TC/TG/TRG TITLE: Solar Energy Utilization

DATE OF MEETING: January 24, 2006 LOCATION: Chicago, IL

MEMBERS PRESENT	YEAR APPTD*	MEMBERS ABSENT	YEAR APPTD*	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Mark Hertel (Chair, Handbook)	03	Tim Merrigan (VC/Research)	02	Gaylen Atkinson (new CM)
Cenk Yavuzturk (Program)	03	Marija Todorovic (Int'l)	03	Costas Balaras (new CM)
John Brown	04	Svein Morner (Web)	CM	Michael Brandemuehl (Guest)
Andrew Chiasson (Sec)	05	Robert Aresty	CM	Brad Collins (new CM)
Andy Lowenstein	05	Billy Black	CM	Jeff Christian (Guest)
Janice Means	05	Norman Buckley	CM	Joe O'Gallagher (new CM)
Christian Vachon	05	Alan Chalifoux	CM	David Gerlach (new CM)
Charlie Cromer	CM	Kevin Cross	CM	Bill Healy (Guest)
Brian Dougherty (Std)	CM	Peter Ellis	CM	Alfred Lutz (new CM)
Sanford Klein	CM	William Fleming	CM	Agami Reddy (new CM)
Tony Pierce	CM	Robert Foster	CM	Dan Thayer (Guest)
Erv Bales	CM	John Gladstone	CM	Bede Wellford (new CM)
		D.Y. Goswami	CM	
		Cory Hasiak	CM	Birol Kilikis (TAC)
		Richard Hayter	CM	Larry Markel (RAC)
		Henry Healey (ALI)	CM	Dave Meredith (Handbook Liaison)
		Hugh Henderson	CM	Mark Owen (ASHRAE Handbook)
		Bion Howard	CM	
		Jim Huggins	CM	
		Fariborz Mahjouri	CM	
		Alfi Helmy Malek (Int'l)	CM	
		David Menicucci	CM	
		Stanley Mumma	CM	
		Richard O'Neil	CM	
		Henry. Peebles	CM	
		Andrew Price	CM	
		Earl Rush	CM	
		David Schieman	CM	
		Harvey Stenger	CM	
		Dean Tompkins	CM	
		Robert Turner	CM	
		Christian Vachon	CM	
		Michael Wassmer	CM	
		Maurice Wildin	CM	
		Byard Wood	CM	
		Paul Zeigler	CM	

\*Starting month as a voting member is July of the year shown.

## DISTRIBUTION

ALL MEMBERS OF TC/TG/TRG

TAC CHAIR: \_\_\_\_\_ E. Groll \_\_\_\_\_

TAC SECTION HEAD: \_\_\_\_\_ B. I. Kilkis \_\_\_\_\_

LIAISONS:

Program: \_\_\_\_\_ J.H. Nix \_\_\_\_\_

ALI: \_\_\_\_\_ J. DeBullet \_\_\_\_\_

Handbook: \_\_\_\_\_ D. Meredith / D. Fitts \_\_\_\_\_

RAC: \_\_\_\_\_ L. Markel \_\_\_\_\_

Standards: \_\_\_\_\_ J. Kohler \_\_\_\_\_

TEGA: \_\_\_\_\_ J. W. Gartner \_\_\_\_\_

Special Pubs: \_\_\_\_\_ L. Fisher \_\_\_\_\_

MANAGER OF RESEARCH AND TECHNICAL SERVICES: \_\_\_\_\_ M. R. Vaughn \_\_\_\_\_

MANAGER OF STANDARDS: \_\_\_\_\_ C. B. Ramspeck \_\_\_\_\_



# ASHRAE

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## MEETING MINUTES ASHRAE TC 6.7 – SOLAR ENERGY UTILIZATION Winter Meeting – January 24, 2006 Chicago, Illinois

### I. CALL TO ORDER, MEETING AGENDA, AND MEETING MINUTES

Meeting called to order at 13:04 by Chair Mark Hertel. A quorum was achieved with seven of nine voting members in attendance. In addition to the chair, voting members present were: John Brown, Andrew Chiasson, Andy Lowenstein, Janice Means, Christian Vachon, and Cenk Yavuzturk. Absent members were: Tim Merrigan and Marija Todorovic (international member). (See Sections 2.2.3 and 5.1 of the *ASHRAE Manual of Procedures for Technical Committees, Task Groups, and Technical Resource Groups* for quorum requirements.)

Cenk Yavuzturk moved and Brian Dougherty seconded to accept the minutes from the Summer 2005 meeting in Denver, CO. Motion passed 7-0-0.

### II. LIAISON REPORTS FROM OTHER COMMITTEES

**ALI** (Henry Healey). No Report.

**TAC** (Birol Kilkis): No Report. Birol Kilkis was present for questions from the TC.

**RAC** (Larry Markel): Larry Markel reported that no final report had been received for RP 1109. Brian Dougherty inquired about payment to the subcontractor, and Larry Markel stated that 25% payment had been withheld until the final report has been received.

Tim Merrigan had submitted the work statement for the proposed research project “The Direct Regeneration of Desiccants with Solar Energy” (RP 1428), which was sent back with comments. The TC chair should receive these via email. Larry Markel stated that the project looks favorable and is worth pursuing, but general comments from reviewers were that it seems “fairly ambitious”. Particularly, the reviewers did not think that obtaining a patent was realistic. Also, the reviewers had some concerns as to the logistics of co-funding the project. Andy Lowenstein inquired about scaling back the scope of the project, and Larry Markel stated that the TC should consider the project from the perspective of getting something useful out of the efforts, and that a patentable item looked like a “fishing expedition”. The TC can refine the work statement and re-submit it, but would need a TC vote. The next RAC meeting is June 2006.

Andy Lowenstein inquired about the best approach for co-funding. Larry Markel replied that Mike Vaughn would work with the TC for a co-sponsor, but better procedures are needed because the likelihood of co-funding at early stages of the project is minimal. Larry added that co-funding has not been very successful thus far, mostly because of differing structures in other organizations. Charlie Cromer gave DOE as an example of a different fiscal structure than ASHRAE.

Mark Hertel inquired about the status of the RTAR regarding solar heating and cooling. Larry Markel said he would check on it and reply by email. Mark Hertel also solicited other research ideas and inquired about working with SRCC, as they have recently scanned an old TC 6.7 document for their website. Larry Markel replied that he thinks ASHRAE would be interested in working with SRCC, since ASHRAE research goals are addressed.

**Handbook** (Dave Meredith, Applications; Doug Fitts, Systems and Equipment): See report in Handbook Subcommittee section.

**Other TCs:** Gaylen Atkinson from TC 1.4 (Control Theory and Application) was present, and stated that a new group is being formed pertaining to controls in green buildings. He solicited volunteers from TC 6.7 to interface with this group, and mentioned that meetings are scheduled for Sundays at 2:00 PM.



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**LEED Energy and Atmosphere TAG** (Bion Howard): No report.

**American Solar Energy Society (ASES):** Brad Collins (ASES Liaison) gave the ASES mission statement, and explained that ASES members generally consist of engineers, architects, and educators. An ASHRAE session is planned for the annual ASES conference in Denver, CO in July 2006. ASES has particularly been engaged in educating architects about available options and resources for green buildings. ASES can put out calls for papers for ASHRAE meetings. A new development of ASES is a valuable tool at [www.findsolar.com](http://www.findsolar.com), which helps users with various aspects of a solar energy projects such as finding a solar contractor and estimating energy savings.

Joe O’Gallagher, who coordinated seminar 57 for the Chicago 2006 meeting, said that ASHRAE and ASES have a lot of common interests, and ASES people are interested and excited about cooperative efforts. ASES would also be interested in helping update ASHRAE standards pertaining to solar energy utilization.

**Other:** Mark Hertel inquired about a possible ASME Liaison, as Agami Reddy was present. This will be deferred to a future meeting.

### III. CHAIR’S REPORT

Chair Mark Hertel reported on matters presented at the TC Chairs meeting/breakfast.

ASHRAE will begin a new format for Programs, shortening them from two (2) hours to one-and-a-half (1½) hours, consisting of three half-hour (½) slots. Programs previously referred to as a *Symposium* will be called a *Transaction Session*, as papers presented in these sessions will be peer-reviewed and will appear in ASHRAE Transactions. Forums will be one hour in length.

The theme for the Quebec City meeting (Summer 2006) will be “Designs for Cold Climates”, and the theme for the Dallas meeting (Winter 2007) will be “How Low Can You Go”.

Regarding electronic communications, the ASHRAE website has a new security policy where members can optionally display contact information. TGs are working on terms and symbols. The electronic communications committee is considering wireless meetings. The e-learning CD is available for demonstration at the bookstore, and has been produced by Elsevier.

ASHRAE is encouraging submittal of papers at the GreenBuild ’06 conference in Denver in November 2006.

Subcommittee meeting times on Sundays present a conflict for some subcommittee members, and it was proposed to consider changing these. Cenk Yavuzturk explained that moving these meeting times could be quite difficult, so this issue of re-scheduling was deferred to the Quebec City meeting.

New TC Activity Sheets are now being used, which is attached at the end of these minutes.

### IV. SUBCOMMITTEE REPORTS

#### A. HANDBOOK SUBCOMMITTEE – MARK HERTEL

TC 6.7 is responsible for two handbook chapters: Chapter 33 of the HVAC Systems and Equipment Handbook, “Solar Energy Equipment, “ and Chapter 33 of the HVAC Applications Handbook, “Solar Energy Use.”

Dave Meredith, Handbook Liaison, was present. The revision of Chapter 33 was not as extensive as originally planned. The level of revision of the Fenestration Chapter in the Fundamentals Handbook was uncertain, and this chapter contains overlapping solar information. The CD+ version of the handbooks provides an on-going opportunity for revisions. Placing some calculation tools on the CD+ version is also being considered.



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The deadline for submittal of the revised Chapter 33 is March 22, 2006. Costas Balaras (who requested to become a new corresponding member) expressed some concern about consistency of Greek symbols in the ASHRAE Handbook with international journal publications. Mark Hertel reported that these would be checked before final submittal, and voting members must approve. A footnote will be provided to include corrections for the southern hemisphere.

The Systems and Equipment Chapter revision is due for submittal on March 22, 2007. Doug Fitts reported that this Chapter will be re-numbered from Chapter 33 to 34. Expected revisions will consist of adding equipment new on the market and deleting old equipment.

## **B. RESEARCH SUBCOMMITTEE – TIM MERRIGAN**

Tim Merrigan, Research Subcommittee Chair was absent. See section II, LIAISON REPORTS FROM OTHER COMMITTEES for research report by Larry Markel of RAC.

## **C. PROGRAM SUBCOMMITTEE – CENK YAVUZTURK**

The Program Subcommittee met Monday evening, Jan. 23, 2006.

**Chicago, Winter 2006:** TC 6.7 is sponsoring one seminar (Seminar 57) on Wed., Jan. 25, 2006 at 10:15 to 12:15. The seminar is entitled “*Current Status of Solar Thermal Technologies for Heating and Cooling*”. The seminar is to be chaired by Svein Morner, and four speakers were scheduled.

**Quebec City, Summer 2006:** One transaction session is planned with the theme of net zero energy buildings, which was being coordinated by Svein Morner, who will also chair the session. This session will follow the new format, which allows three half-hour speaker slots. Christian Vachon volunteered to chair a seminar with a theme of solar energy uses in cold climates. The program submission deadline is Feb. 10, 2006.

**Dallas, Winter 2007:** One seminar is planned, hopefully ASES-sponsored. Cenk Yavuzturk will make contact with Gary Vliet at the University of Texas-Austin to help with the planning.

**Long Beach, Summer 2007:** One seminar is proposed with BIPV being the possible theme. However, more details will be deferred until the ASHRAE conference theme is known.

## **D. STANDARDS SUBCOMMITTEE – BRIAN DOUGHERTY**

The standards subcommittee report is provided below.

## **E. WEBMASTER – SVEIN MORNER**

Svein Morner was absent, but Mark Hertel relayed that the TC 6.7 website had good feedback and was “among the best”. Privacy policies were discussed in the Chair’s Report.

## **F. AWARDS – JANICE MEANS**

No report.

## **V. Membership**

Mark Hertel suggested updating the roster, as several corresponding members no longer correspond, or have outdated contact information. Mark proposed dropping any member from the list that has not corresponded in over 10 years. There were several people attending this TC meeting who wished to become new corresponding members. These members are shown on the TC cover sheet for these minutes.

Mark Hertel announced that Tim Merrigan is due to roll off as a voting member, and solicited a volunteer to become a voting member. Cenk Yavuzturk nominated Brian Dougherty, who accepted. Therefore, Tim Merrigan will roll off



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as voting member effective July 1, 2006, and will be replaced by Brian Dougherty. Tim Merrigan will remain Vice Chair.

## **VI. OLD BUSINESS:**

Membership updates were discussed (see Membership section).

## **VII. NEW BUSINESS**

Mark Hertel announced an upcoming IEA-sponsored conference on thermal storage. Reviewers for a solar cooling article for ASHRAE Journal were solicited.

## **VIII. ADJOURNMENT**

The meeting was adjourned at 15:00 PM.



# ASHRAE

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Standards Subcommittee Report  
ASHRAE TC 6.7 Solar Energy Utilization  
2006 Winter Meeting – Chicago  
Standards Committee Liaison to TC 6.7: Jay Kohler

**Std 93-2003** *MOT to Determine the Thermal Performance of Solar Collectors*

The current standard is a reaffirmation of the 1986 publication and its latest ANSI approval occurred on April 22, 2003. The review by ASHRAE staff shows that the standard contains a few outdated references. Because updating the references is likely to cause substantive changes, the standard could not be reaffirmed again. A revision could be minor but would require the creation of a standards project committee (SPC). In Chicago, TC 6.7 recommended to revise the standard. Charlie Cromer was recommended as the chair of the new SPC. Both committee votes were 7-0-0-1 (CV). The votes were forwarded to the ASHRAE Standards Committee and will likely be voted on for approval at the Annual Meeting in Quebec City.

**Std 95-1987P<sup>1</sup>** *MOT to Determine the Thermal Performance of Solar Domestic Water Heating Systems*

SPC Chair: Tim Merrigan

SPC Liaison: Roger Hedrick

Co-cognizant TC: 6.6 (Service Water Heating)

Relatively new ASHRAE procedures allow SPC 95P to move forward with its plans to conduct a Modified adoption of ISO Standard 9459-1: 1993, “Solar heating – Domestic water heating systems – Part 1: Performance rating procedures using indoor test methods.” The ISO standard will replace ASHRAE Standard 95. ASHRAE staff have confirmed that SPC 95 does not have to be repopulated in order for the modified adoption to begin. The August 1995 vote (5-0-1) to recommend the adoption is still viewed as acceptable. New SPC 95 members will be needed if comments are received during the public review.

**Std 96-1980 (RA 89)P<sup>1</sup>** *MOT to Determine the Thermal Performance of Unglazed Flat-Plate Liquid-Type Solar Collectors*

SPC Chair: James Huggins

SPC Liaison: Roger Hedrick

SPC 96P plans to consider an identical or modified adoption of ISO Standard 9806-3: 1995, “Test methods for solar collectors -- Part 3: Thermal performance of unglazed liquid heating collectors (sensible heat transfer only) including pressure drop” in lieu of, or in addition to, revising ASHRAE Standard 96. SPC 96P needs additional volunteers to serve on the committee. If a minimum committee size of 5 members cannot be obtained by the Annual Meeting in Quebec City, a relatively new policy will require ASHRAE staff to issue a “Withdrawal Public Review” notice for Standard 96.

ASHRAE and non-ASHRAE members willing to participate on SPC 96P must complete the “Application for PC Membership” that is available at <http://www.ashrae.org/template/TechnologyLinkLanding/category/1638>. Individuals also need to generate/update their on-line biographical information, including providing entries for conflict of interest and bias, by accessing <http://xp20.ashrae.org/bio/>. If you have questions, contact the Secretary to the ASHRAE Manager of Standards (404-636-8400, ext. 1136 or [standards.section@ashrae.org](mailto:standards.section@ashrae.org)) or the SPC 96P chair.

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<sup>1</sup> \*NOTE: Standards 95 and 96 are designated as “Proposed” rather than as a “Revision” due to exceeding the maximum time frame in which a standard may retain the ANSI designation.



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## **Std 109-1986 (RA 03) *MOT to Determine the Thermal Performance of Flat-Plate Solar Collectors Containing a Boiling Liquid***

The current standard is a reaffirmation of the 1986 publication and its latest ANSI approval was gained on April 22, 2003. TC 6.7 has been asked to recommend whether to revise, reaffirm, or withdraw (R/RA/W) this standard. The review by ASHRAE staff shows that the standard contains a few outdated references and the units format, ideally, should be updated to SI rational first. Because updating these references is viewed as likely to cause substantive changes, the standard cannot be reaffirmed. A revision could be relatively minor but would require the creation of a SPC. In Chicago, TC 6.7 postponed action on how to proceed with this standard. The R/RA/W recommendation will be considered at TC 6.7's next meeting, in Quebec City.

## **Std 125-1992 (RA 00) *MOT Thermal Energy Meters for Liquid Streams in HVAC Systems***

Cognizant (Lead) TC: 6.1, Hydronic and Steam Heating Equipment and Systems

Co-cognizant TC: 6.7

The reaffirmation public review was completed in late June 2005. No comments were received. The document was approved for publication by the ASHRAE Board of Directors on January 22, 2006.

## **Canvass Ballots - None**

### **ISO Technical Committee 180 (Solar Energy)**

#### **Subcommittee 4 (Systems – Thermal Performance, Reliability, and Durability)**

**ISO TC 180 Secretariat: Australia**

**ISO TC180/SC4 Secretariat: ASHRAE**

ASHRAE holds the secretariat for Subcommittee 4 within TC 180, Systems – Thermal Performance, Reliability and Durability. Jim Huggins serves as the SC 4 chair. The SC met in Orlando on August 12, 2005 in conjunction with the ISES Solar World Congress.

1. ISO Standard 9459-1: 1993, “Solar heating – Domestic water heating systems – Part 1: Performance rating procedures using indoor test methods”  
Cognizant SC: 4  
ISO document stage code is 90.93 – international standard confirmed.
2. ISO Standard 9459-3: 1997, “Solar heating – Domestic water heating systems – Part 3: Performance tests for solar plus supplementary systems”  
Cognizant SC: 4  
Standard has been withdrawn by ISO.
3. ISO / AWI 9459-4, “Solar heating – Domestic water heating systems – Part 4: System performance characterization by means of component tests and computer simulations”  
Cognizant SC: 4  
The program has been reinstated and will use ENV/CEN 12977-2, “Thermal solar systems and components – Custom built systems – Part 2: Test methods” as the basis for the ISO document. Consideration will also be given to referencing the Australian standard AS 4234, “Solar water heaters – Domestic and heat pump –





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Calculation of energy consumption.” Jim Huggins will be the project leader. Nominations for experts from the participating countries are being generated.

ISO document stage code is 20.00 – new project registered in TC/SC work program.

4. ISO/CD 9459-5, “Solar heating – Domestic water heating systems – Part 5: System performance characterization by means of whole-system tests and computer simulation”  
Cognizant SC: 4  
Work is to proceed in parallel with CEN TC 312. A 5-month ballot at the Draft International Standard (DIS) stage closes on 6 February 2006. Once the standard is published, work to completely revise the standard will proceed. A proposed version of the next generation standard has already been developed and will soon be circulated as an enquiry draft.  
ISO document stage code is 40.20 – DIS ballot initiated.
5. ISO/AWI TS 11924, “Solar heating – Domestic water heating systems – Test methods for the assessment of protection from extreme temperatures and pressures”  
Cognizant SC: 4  
Work is to proceed in parallel with CEN TC 312. The current version has been published as a Technical Specification and now they are revising it with the goal of publishing it as an ISO Standard.  
ISO document stage code is 20.99 – working draft approved for registration as a committee draft.
6. ISO Standard 9806-3: 1995, “Test methods for solar collectors – Part 3: Thermal performance of unglazed liquid heating collectors (sensible heat transfer only) including pressure drop”  
Cognizant SC: 5 (Collectors and other components)  
ISO document stage code is 90.93 – international standard confirmed.

Report Submitted By: Brian Dougherty

## TC/TG Activity Feedback Form

Please provide feedback on your TC/TG activities and return this form to your Section Head by email or drop off a printed copy in the Section Head's mailbox folder outside the ASHRAE Headquarters Room by Tuesday night 9:00 pm.

From TC 6.7	Committee Name: <i>SOLAR ENERGY UTILIZATION</i>
	Chair: <i>MARK HERTEL</i>

Meeting was Held	(Day) <i>TUESDAY</i>	(Date) <i>JAN. 24, 2006</i>
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<b>Membership</b>		
	Number Present	Total Number on Committee
Voting Members	<i>7</i>	<i>9</i>
International Members	<i>0</i>	<i>2</i>
Corresponding Members	<i>5</i>	<i>36</i>
Visitors and Guests	<i>14</i>	

<b>Handbook Responsibilities *</b>		<b>Standards Responsibilities *</b>	
Volume and Chapter (number only)	Next Revision Due Date	Standards Number (number only)	Next reaffirmation date
<i>APPLICATIONS 33</i>	<i>MAR. 22, 2006</i>	<i>109-2003</i>	<i>APR.22, 2006</i>
<i>SYS. &amp; EQUIP. 33</i>	<i>MAR. 22, 2007</i>	<i>93-2003</i>	<i>APR. 22, 2006</i>
		<i>95-1987</i>	
		<i>96-1980</i>	
		<i>125-2002</i>	

<b>Program Activities * at this Meeting</b>		
Symposiums	Seminar	Forum
	<i>NO. 57</i>	

<b>Current Research Activities *</b>		<b>FAQs Responsibilities *</b>	
Research Project (number only)	PMS meeting held (yes/no)	FAQ number (number only)	Last time reviewed
<i>1109</i>		<i>79</i>	
<i>1428</i>			

Does Committee have Web Site on ASHRAE Server?   YES  

If so, is Web Site up to date?   YES  

Any requests of the Technical Activities Committee ?