

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**

TC/TG/TRG NO.: T.C. 6.7                      DATE: November 2010  
 TC/TG/TRG TITLE: Solar Energy Utilization  
 DATE OF MEETING: June 29, 2010                      LOCATION: Albuquerque, NM

MEMBERS PRESENT	YEAR APPTD*	MEMBERS ABSENT	YEAR APPTD*	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Cenk Yavuzturk (Chair)	08	Robert Aresty	CM	Ali Al-Alili
Gaylen Atkinson	09	Erv Bales	CM	Casiano Armenta
Costas Balaras (Handbook)	07	William Bahnfleth	CM	William Craddick
John Brown	CM	Alan Chalifoux	CM	Jaap Hogeling
Andrew Chiasson (Sec)	CM	Brad Collins	CM	Dave Meredith
Brian Dougherty (Std)	06	Charlie Cromer	09	
Mark Hertel	09	Kevin Cross	CM	
Janice Means (Program)	CM	Robert Davis	CM	
Tim Merrigan (VC/Research)	08	Peter Ellis	CM	
Svein Morner (Web)	CM	Robert Foster	CM	
Marija Todorovic	09	David Gerlach	CM	
		John Gladstone	CM	
		D.Y. Goswami	CM	
		Cory Hasiak	CM	
		Richard Hayter	CM	
		Henry Healey (ALI)	CM	
		Hugh Henderson	CM	
		Bion Howard	CM	
		Jim Huggins	CM	
		Pamela Immekus	CM	
		Sanford Klein	CM	
		Wilfred Laman	09	
		Andy Lowenstein	CM	
		Alfred Lutz	CM	
		Fariborz Mahjouri	CM	
		Jeff Mahoney	CM	
		Andrew McNamara	CM	
		Alfi Helmy Malek	CM	
		Stanley Mumma	CM	
		Joseph O'Gallagher	CM	
		Henry. Peebles	CM	
		Andrew Price	CM	
		Talal Rabiah	CM	
		Agami Reddy	CM	
		Harvey Stenger	CM	
		Menalaos Stylianou	CM	
		Ather Syed	CM	
		Gregoris Thoma	CM	
		Dean Tompkins	CM	
		Christian Vachon	CM	
		Michael Wassmer	CM	
		Scott Wayland	CM	
		Dean Wiersma	CM	
		Bede Wellford	CM	
		Maurice Wildin	CM	
		Byard Wood	CM	
		Paul Zeigler	CM	

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



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## DISTRIBUTION

ALL MEMBERS OF TC/TG/TRG

TAC CHAIR:           B. Becker          

TAC SECTION HEAD:   J. Dunlap  

LIAISONS:

Program:           L. Jackins                                ALI:           T. McGinn          

Handbook:   M Modera (Appl); T. Lawrence (S&E)                        RAC:           J. Hogeling          

Standards:           J. Kohler                                TEGA:                                   

Special Pubs:           J. Keen          

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

MANAGER OF STANDARDS:           S. Reiniche



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## ASHRAE TC 6.7 – SOLAR ENERGY UTILIZATION

**Annual Meeting – June 29, 2010**

Albuquerque, New Mexico

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

The meeting was called to order at 1:05 PM by Chair Cy Yavuzturk. Quorum was initially not met at the start of the meeting, with only four voting members present, and five needed for a quorum.

Five voting members (achieving quorum) were in attendance by 1:20 PM, and the Orlando (winter 2010) meeting minutes were approved. Tim Merrigan moved to approve and Brian Dougherty seconded. Voting members present at that time were Cy Yavuzturk, Tim Merrigan, Mark Hertel, Brian Dougherty, and Marija Todorovic. The motion carried 5-0.

### II. CHAIR’S REPORT (Cy Yavuzturk)

Cy Yavuzturk reported on news from the TC Chairs’ breakfast meeting. ASHRAE wishes to promote the young engineers program (YEA), and will be increasingly gearing future meetings toward getting young engineers involved. Regarding TC meetings, possibilities are being examined to hold meetings via live webcast, in addition to making the TC meetings shorter. The number of RTAR submittals has been down recently, and TCs are encouraged to increase the number of these submittals. Work on the Advanced Energy Design Guide is underway.

### III. SUBCOMMITTEE REPORTS

#### A. HANDBOOK – MARK HERTEL

Mark Hertel reported that the Applications Handbook chapter has been submitted. The Applications Handbook Liaison (Mike Modera) was present and thanked the TC for a timely submittal. The Systems & Equipment Handbook Chapter 36 has gone to the TC for comments.

Mark Hertel will be stepping down as Handbook subcommittee chair as of June 30, 2010, and Chair Yavuzturk thanked Mark for his tireless efforts over the past several years.

Costas Balaras will take over as the new Handbook subcommittee chair as of July 1, 2010. Costas proposed the possibility of a chapter in the Fundamentals Handbook addressing renewable energy resources.

#### B. RESEARCH – TIM MERRIGAN

Tim Merrigan reported on the research subcommittee meeting held Monday Jun. 28.

The new ASHRAE strategic plan contains several references to solar energy technology in its research goals. This strategic plan prompted some ideas for TC 6.7 research.

Tim Merrigan will take the lead on two RTARs: one to revise the solar design manual, and another to develop a database with design examples for engineers. Cy Yavuzturk will take the lead on an RTAR for development of a test method for concentrating collectors; SRCC currently has no test method for concentrating collectors. Brian Dougherty and Marija Todorovic will look into standards for BIPV and possible co-interest with TC 4.4.

Two RTARs had previously been developed: (1) “Coupling of solar heating with heat recovery units” and (2) “Solar assisted (or boosted) geo-co- and tri-generation”. The status of these RTARs was not entirely clear.



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TC 1.10 had taken the lead on RTAR (2) and it was believed to have been submitted to ASHRAE. Marija Todorovic will provide feedback from TC 1.10, and Janice Means will check on the status of RTAR (1).

Representatives from TC 4.2 were at this meeting and solicited co-sponsorship on a new clear sky model being developed. TC 6.7 was in agreement with this idea, and Chair Yavuzturk will send an email approval to TC 4.2 for co-sponsorship.

## **C. PROGRAM – JANICE MEANS**

Janice summarized news from the Program Chairs' meeting. Seminars and forums will be scheduled after conference and technical sessions are scheduled. Conference and technical sessions will be selected by track chairs. Re-submissions will not be accepted for programs unless the new submission is improved over the old one.

Janice Means reported that the programs subcommittee met on June 28.

Proposed ideas for seminars at the Las Vegas Meeting included "Low Energy Design". Cy Yavuzturk has been investigating getting papers for solar applications in desert climates. Svein Morner suggested a seminar on pool heating.

Proposed session topics for the Montreal meeting (June 2011) included "Commissioning of Solar Systems", for which Svein Morner will try to get conference papers, and "Solar for Cold Climates", for which Cy Yavuzturk will contact someone from Natural Resources Canada.

Ideas for the Chicago meeting (January 2012) included the Solar Decathlon. Janice Means volunteered to contact S. Hayter or D. Collier.

## **D. STANDARDS – BRIAN DOUGHERTY**

See attached report submitted by Brian Dougherty. In addition, Brian mentioned that Standard 93 is now current, thanks to Charlie Cromer. Standards 95 and 96 are currently in revision.

## **E. WEBSITE – SVEIN MORNER**

TAC section head mentioned that the website is in good shape, except for some missing final meeting minutes.

## **E. MEMBERSHIP – CENK YAVUZTURK**

Cy Yavuzturk's term as Chair will end June 30, 2010, but his term has been extended one year until June 30, 2011. Brian Dougherty is the only member rolling off on June 30, 2010. Members rolling on as of July 1, 2010 include Andrew Chiasson and Janice Means.

## **IV. LIAISON REPORTS FROM SOCIETY & OTHER ORGANIZATIONS**

**ALI** (Henry Healey): Henry was not present at this meeting. Mark Hertel mentioned that ASHRAE wants a separate short course on photovoltaics.

**TAC** (John Dunlap): John had no news, other than that he felt things are going well with TC 6.7.

**RAC** (Jaap Hogeling): Jaap re-iterated the significant role of solar energy in ASHRAE's research plan.

**Handbook** (Mark Modera and Tom Lawrence): No formal report.



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## Other TCs:

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

**American Solar Energy Society (ASES)**: No report.

**American Society of Mechanical Engineers (ASME)**: No report.

**Standards Liaison**: See subcommittee report below.

**Solar Decathlon** (Mike Wassmer): No report.

**Energy Guide** (Don Colliver): No report.

## **V. OLD BUSINESS**

John Hollick approached ASHRAE to help with funding of a solar air heating design manual. Natural Resources Canada will provide partial funding. Cy Yavuzturk will write to ASHRAE for permission to support funding of design manuals.

## **VI. NEW BUSINESS**

None.

## **VII. ADJOURNMENT**

Meeting adjourned approximately 3:30 PM.



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Standards Subcommittee Report  
ASHRAE TC 6.7 Solar Energy Utilization  
2010 Annual Conference – Albuquerque  
Standards Committee Liaison to TC 6.7: James Vallort

**Std 93-2010** *MOT to Determine the Thermal Performance of Solar Collectors*

The revised standard completed the ASHRAE/ANSI approval process on January 28, 2010. The 2010 standard replaces the version that was last revised in 1986. The standard will next be considered by TC 6.7 for revision, reaffirmation, or withdrawal in 2013.

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

SPC Chair: Tim Merrigan

SPC Liaison: Boggarm Setty

Co-cognizant TC: 6.6 (Service Water Heating)

SPC 95P needs to formally recommend that ASHRAE 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. A Word version of the ISO standard containing both substantive and non-substantive modifications has been generated. Although ASHRAE staff originally agreed that SPC 95 did not have to be repopulated, the ASHRAE Standards Committee is now recommending that new members be added. Chairman Merrigan has been addressing the membership issue.

**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: Boggarm Setty

SPC 96P plans to pursue 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.” SPC 96 Chair Jim Huggins has requested that ASHRAE staff generate a Word version of the ISO standard so that the SPC may use it as a working draft. SPC 96 has been otherwise inactive over the last few years.

**Std 125-1992 (RA 06)** *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

TC 6.1 voted at the January 2010 meeting in Orlando to recommend that this standard be reaffirmed. This recommendation is currently under consideration by the ASHRAE Standards Reaffirmation Subcommittee (SRS).

**Canvass Ballots - None**

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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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## TC 6.7 Standards Subcommittee Report 2010 Annual Conference – Albuquerque

### **ISO Technical Committee 180 (Solar Energy) Subcommittee 4 (Systems – Thermal Performance, Reliability, and Durability) ISO TC 180 Secretariat: Australia ISO TC180/SC4 Secretariat: USA (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.

ISO TC 180 plans to continue holding joint meetings with CEN/TC 312 and/or IEA Task Group 43, when possible. The most recent meeting took place in Pretoria, South Africa on October 15-16, 2009. The next meeting of TC180/SC4 is tentatively scheduled for October 2010 in Brussels.

IEA Task Group 43 is working to harmonize solar thermal collector and system test methods worldwide, and then may seek to do the same for certification programs. Their last meeting was held in Stuttgart in February 2010 and was well attended. The Task Group's next meeting is scheduled to occur in conjunction with the above noted October TC 180/SC4 meeting.

Several ISO solar thermal standards are currently being revised or revisions are planned in the near future. Opportunities therefore exist for US experts to serve on ISO working groups and as members of the US Technical Advisory Group that ultimately formulates the US position on these ISO standards. Anyone who can serve in such a capacity is asked to contact Doug Tucker, Assistant Manager of Standards – International ([dtucker@ashrae.org](mailto:dtucker@ashrae.org) or 404-636-8400, ext. 504). As noted below, the revised ISO Standard 9495-4 is currently out for review at the Draft International Stage (DIS) and ASHRAE is seeking reviewers to help generate the US submitted comments and the overall US position on this version of the revised standard.

1. ISO Standard 9459-1: 1993, “Solar heating – Domestic water heating systems – Part 1: Performance rating procedures using indoor test methods”  
Cognizant SC: 4  
ASHRAE SPC 95 is pursuing a modified adoption of this ISO standard. No activity has been reported on the ISO Standard itself for a few years.  
ISO document stage code is 90.60 – close of review.
2. ISO Standard 9459-2: 1995, “Solar heating – Domestic water heating systems – Part 2: Outdoor test methods for system performance characterization and yearly performance prediction of solar-only systems.”  
Cognizant SC: 4  
This standard is being revised. Spain, for example, is proposing modifications to Section 9, “Prediction of long-term performance,” during the systematic review ballot that is scheduled to end on 15 March 2010.  
ISO document stage code is 90.60 – close of review.
3. ISO Standard 9459-3: 1997, “Solar heating – Domestic water heating systems – Part 3: Performance tests for solar plus supplementary systems”  
Cognizant SC: 4  
This withdrawn standard is being reinstated. The Secretary will prepare a New Work Item Proposal and a new draft based on Australian national standard AS 2984.



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## TC 6.7 Standards Subcommittee Report 2010 Annual Conference – Albuquerque

4. ISO/DIS 9459-4, “Solar heating – Domestic water heating systems – Part 4: System performance characterization by means of component tests and computer simulation”  
Cognizant SC: 4  
The document is currently out for review and balloting at the Draft International Stage (DIS). The proposed test method is for complete systems and uses the component test plus system simulation method. The proposed method is based on a combination of SRCC TM-1 and EN 12976-2. The comment period closes September 12, 2010. ASHRAE is seeking US members to review the revised standard and help formulate the US comments and position. Please contact ASHRAE’s Doug Tucker (contact information provided above) if you wish to obtain a copy of the document and provide a review. ISO document stage code is 40.20 – DIS ballot initiated: 5 months.
5. ISO Standard 9459-5: 2007, “Solar heating – Domestic water heating systems – Part 5: System performance characterization by means of whole-system tests and computer simulation”  
Cognizant SC: 4  
The document was published as an international standard in May 2007.  
ISO document stage code is 90.20 – International standard under periodic review.
6. ISO Standard 9806-1: 1994, “Test methods for solar collectors – Part 1: Thermal performance of glazed liquid heating collectors including pressure drop”  
Cognizant SC: 5 (Collectors and other components)  
At the Pretoria meeting, TC 180 reaffirmed its previous decision to initiate New Work Items for revising all three parts of ISO Standard 9806. The projects will be carried out as joint ISO/EN Standards by CEN/TC 312/WG1 that will have additional membership from TC 180. The eventual documents will replace the current ISO 9806 and EN 12975-2 series of standards.  
ISO document stage code is 90.93 – international standard confirmed.
7. ISO Standard 9806-2: 1995, “Test methods for solar collectors – Part 2: Qualification Test Procedures”  
Cognizant SC: 5 (Collectors and other components)  
See comments given above with ISO Standard 9806-1.  
ISO document stage code is 90.93 – international standard confirmed.
8. 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)  
See comments given above with ISO Standard 9806-1.  
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>Cy Yavuzturk</i>

Meeting was Held	(Day) <i>TUESDAY</i>	(Date) <i>JUN. 29, 2010</i>
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<b>Membership</b>		
	Number Present	Total Number on Committee
Voting Members	7	9
International Members	1	1
Corresponding Members	4	47
Visitors and Guests	5	

<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>A 33</i>	<i>MARCH 2013</i>	<i>93-2003</i>	
<i>S 36</i>	<i>MARCH 2011</i>	<i>95-1987</i>	
		<i>96-1980</i>	
		<i>109-1986</i>	
		<i>125-2002</i>	

<b>Program Activities * at this Meeting</b>		
Transactions	Seminar	Forum

<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>79</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 ?