

**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 18, 2003

TC/TG/TRG TITLE: Solar Energy Utilization

DATE OF MEETING: January 28, 2003 LOCATION: Chicago, IL

MEMBERS PRESENT	YEAR APPTD*	MEMBERS ABSENT	YEAR APPTD*	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
S. Morner (C/Web)	01	R. Foster	99	William Bahnfleth (TAC 6.0 Section Head) Tony Pierce (G) Cenk Yavuzturk (G) Kate Merrill (G) Andrew Chiassom (G) Andrew Price (G) Mike Wassmer (G) Kevin Cross (G) John Gladstone (G) Mario Berrios (G) John R. Brown (G) Sieglinde Kinne (G)
T. Merrigan (VC/Std)	02	J. Huggins	00	
B. Dougherty (Sec)	00	D. Menicucci	02	
A. Helmy Malek (Int'l)	00	H. Stenger	02	
M. Hertel (Handbook)	CM	H. Healey (Program)	CM	
		P. Zeigler (Research)	CM	
C. Cromer	CM	R. Aresty	CM	
R. Hayter	CM	E. Bales	CM	
		B. Black	CM	
		N. Buckley	CM	
		M. Butler	CM	
		A. Chalifoux	CM	
		W. Fleming	CM	
		D. Goswami	CM	
		H. Henderson	CM	
		B. Howard	CM	
		S. Klein	CM	
		L. Lister	CM	
		F. Mahjouri	CM	
		S. Mumma	CM	
		E. Olsen	CM	
		R. O'Neil	CM	
		H. Peebles	CM	
		E. Rush	CM	
		D. Schieman	CM	
		E. Seiler	CM	
		M. Todorovic	CM	
		D. Tompkins	CM	
		R. Turner	CM	
		M. Wildin	CM	
		B. Wood	CM	

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

## **DISTRIBUTION**

ALL MEMBERS OF TC/TG/TRG

TAC COMMITTEE CHAIRMEN: W. E. Murphy

TAC SECTION HEAD: W. P. Bahnfleth

LIAISONS:

Program: F. W. Betz Journal: J. A. Pietsch

Handbook: R. L. Davis RAC: N. C. Lovvorn

Standards: D. E. Knebel

MANAGER OF TECHNICAL SERVICES: M. R. Vaughn

MANAGER OF RESEARCH: W. W. Seaton

MANAGER OF STANDARDS: C. B. Ramspeck



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## MEETING MINUTES ASHRAE TC 6.7 – SOLAR ENERGY UTILIZATION Winter Meeting – January 28, 2003 Chicago, Illinois

### I. CALL TO ORDER

The meeting was called to order by chairman Svein Morner at 1:10pm. The attendees made self-introductions and a sign-in sheet was circulated. Four of eight voting members were present -- which upon review of the *ASHRAE Manual of Procedures for Technical Committees, Task Groups, and Technical Resource Groups* – did not constitute a quorum. Thus, no official voting could take place at the meeting. A letter ballot was sent for all pertinent votes. The email ballot results are noted in the text below.

### II. MINUTES OF PREVIOUS MEETINGS

Two typographical errors were noted in the minutes from the January 2002 meeting in Atlantic City. Tim Merrigan moved that the January 2002 minutes be accepted, as amended. Brian Dougherty second the motion. The motion (tentatively) passed (4-0-0, CV).

*Letter ballot to approve the January 2002 minutes: **Approved: 6-0-0, CV (2 not responding)***

Tim Merrigan moved that the June 2002 minutes be accepted. Brian Dougherty second the motion. The motion (tentatively) passed (4-0-0).

*Letter ballot to approve the June 2002 minutes: **Approved: 6-0-0, CV (2 not responding)***

### III. LIAISON REPORTS FROM OTHER COMMITTEES - None

### IV. ANNOUNCEMENTS

Chairman Morner recognized Past-President Dick Hayter. Hayter provided information on the upcoming CIBSE conference in Scotland and encouraged participation by ASHRAE members. The conference is being co-sponsored by ASHRAE. Abstracts on technical papers are due February 15, 2003. The conference is scheduled for September 24-26, 2003.

Later in the meeting, Chairman Morner recognized TAC 6.0 section head, Bill Bahnfleth. Bahnfleth noted that rosters must be submitted by Tuesday evening. With regard to the handbooks, Bahnfleth reported that members have complained that they are too theoretical and contain outdated or irrelevant materials. Past President Bill Coad reviewed the entire HVAC Systems and Equipment Handbook and had similar comments. As a starting point for improvement, members who participate in the revision of handbook chapters are strongly encouraged to first review the *Author and Reviser Guide* (<http://xp20.ashrae.org/about/hbrevisersgd2001dec.pdf>). Bahnfleth confirmed that annual updates to any handbook chapter will be possible although TAC will continue focusing on one handbook at a time. Bahnfleth encouraged attendees to nominate deserving members for the technical achievement award. The award is presented at the TC Chairs breakfast but work is underway to elevate the award to a society level award whereby it would be handed out at the Plenary Session. Nominees may be any TC member except the chair. Finally, Bahnfleth confirmed that presentations from sponsored seminars may now be posted on the TC's website.

Near the end of the meeting, ASHRAE's Mark Owen, the Handbook Editor, was recognized. Owen explained that E-book and the 4-volume set are the same product. All handbook related questions that our TC may have should be directed to Owen.



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## V. MEMBERSHIP

Chairman Morner went over the roster for the next society year. Robert Foster will cycle off as a voting member after the June 2003 meeting. Mark Hertel and Cenk Yavuztrk agreed to cycle on as voting members. Marija Todorovic, who attended the TC 6.7 program subcommittee meeting, was suggested as possible international member. Chairman Morner took the names and obtained the ASHRAE membership numbers from attendees wishing to become corresponding members: Mike Wassmer, Andrew Chiasson, Tony Pierce, and John Gladstone. Chairman Morner accepted volunteers for all subcommittee assignments, except the liaison to the ASHRAE Learning Institute (ALI). Suggestions for nominees for the ALI liaison position included Henry Healey and Sandy Klein. The committee, starting in July 2003, will be:

- Svein Morner - Chair
- Tim Merrigan - Vice Chair and Research Subcommittee Chair
- Mark Hertel - Handbook Subcommittee Chair
- Cenk Yavuzturk - Program Subcommittee Chair
- Brian Dougherty - Secretary and Standards Subcommittee Chair
- Tony Pierce (CM)- TC Webmaster
- Member - Jim Huggins
- Member - Dave Menicucci
- Member - Harvey Stenger
- Intl. Member - Alfi Malek

## VI. SUBCOMMITTEE REPORTS

### A. HANDBOOK SUBCOMMITTEE – MARK HERTEL

The Handbook Subcommittee met on Sunday from 3:00 to 5:00pm. TC 6.7 is responsible for two handbook chapters: Chapter 33 of the HVAC Systems and Equipment Handbook, “Solar Energy Equipment,” and Chapter 32 of the HVAC Applications Handbook, “Solar Energy Use.” Revisions to Chapter 33 are due by May 2003 although TAC is asking that TCs having completed chapters to submit them in advance of the deadline. TC 6.7, for example, has been asked to move up its submittal date to March. Handbook Subcommittee Chair Mark Hertel is in the process of implementing final changes to Chapter 33. Anyone wishing to offer proposed revisions for the next printing of Chapter 33 needs to submit those changes to Hertel immediately. A letter ballot vote will be conducted to approve Chapter 33 for submittal.

After this revision cycle to Chapter 33 ends, work will shift to conducting a major rewrite of both chapters. One goal is to have each individual chapter better meet the needs of practicing engineers. A second goal is to have the two chapters complement each other better. These future revisions need to cover cost and maintenance issues. Also, terminology and units need to be consistent with other handbook chapters; contact TC 1.6 (Terminology) for assistance.

Hertel drafted an overall outline that contained the major topics from both chapters (basically, Applications Chapter 32 topics first and then Systems and Equipment Chapter 33 topics second) and distributed it to TC 6.7 members in October 2002. The proposed outline was discussed at the Sunday subcommittee meeting. Comments on modifying the outline were discussed. The attendees decided that any member having suggested changes to the outline should provide those suggestions to Hertel via email ([kanela@lava.net](mailto:kanela@lava.net)). Prior to the next meeting in Kansas City, Hertel will seek to complete at least one iteration of distributing a revised outline to members in an effort to solicit further suggested changes prior to starting the writing process.

Hertel reported that TC 6.7 member Dave Menicucci is investigating whether personnel at Sandia National Laboratories, via DOE sponsorship, may be able to lead the time-intensive, major rewrite of the two TC 6.7



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handbook chapters. The Chicago attendees favored moving forward with this offer. Hertel will report back to the TC with details on the process if participation is authorized by Sandia/DOE.

A separate meeting for Handbook Subcommittee chairs was held at the same time on Sunday as the TC 6.7 Handbook Subcommittee meeting. Mike Wassmer attended the former meeting on behalf of TC 6.7. Wassmer reported back at the TC 6.7 meeting that ASHRAE is embarrassed with the Handbooks. The Handbooks are judged as being too technical and so need to be “dumbed down.” Regarding the transition to having the handbooks on CD-ROM, the attendees learned that the four-volume set will become the member benefit in either 2004 or 2005. When this change occurs, a member can still purchase a hard copy of a handbook at a cost of \$50. At this stage, ASHRAE has slowed its pursuit of adding video, audio, spreadsheet, etc. to the E-book version because such add-ins are too expensive. In the future, revisions to the handbooks will be due immediately following the Winter meeting (i.e., in February).

## **B. RESEARCH SUBCOMMITTEE – SVEIN MORNER FOR PAUL ZEIGLER**

Two Research Topic Acceptance Requests (RTARs) – (1) Solar Radiant Heating and Cooling and (2) Optimization and Testing of a Double Effect Solar Driven Absorption Chiller and Dual Fired Generator – were submitted to ASHRAE’s Manager of Research prior to the Chicago meeting. These two RTARs will be considered by the Research Administration Committee (RAC) at the Kansas City meeting. Cenk Yavuzturk offered to draft a new RTAR on the subject of solar thermal storage for ground source heat pump applications. Possible co-sponsors of such a research proposal are TC 6.8 (Geothermal Energy Utilization) and TC 6.9 (Thermal Storage). Charlie Cromer noted that seasonal and diurnal storage have been studied extensively. A project geared towards optimizing the coupling with a geothermal heat pump was thought to be original.

## **C. PROGRAM SUBCOMMITTEE – SVEIN MORNER FOR HENRY HEALEY**

The Program and Research Subcommittees met on Monday from 6:30 to 9:00 pm. At the subcommittee meeting, Marija Todorovic agreed to take the lead on organizing two, related programs: a seminar for Kansas City and a symposium for Anaheim. Although the proposed titles were still in flux, two beginning attempts were expressed at the subcommittee meeting: “Architecturally Integrated Renewable Energy Sources for Optimizing Building Sustainability” and “Sustainable Building Integration.”

At the meeting of the full TC, Chairman Svein Morner and attendee Andrew Price led discussions on a possible seminar for Kansas City. The proposed title for the seminar is: Solar Domestic Hot Water Standards and Applications. Price has three speakers in mind who could discuss recent projects in Wisconsin to refurbish solar thermal systems. Jim Huggins or Byard Wood were suggested as the possible fourth seminar presenter. Jim or Byard would be asked to address the role and scope of SRCC and ASHRAE standards. This particular seminar was judge to be a good response to the interests expressed at the Chicago forum, “What Can ASHRAE and Its Members Do to Increase the Use of Solar Energy?” Forum attendees indicated that they want to see more on working systems, reliability issues, and what standards come into play.

Initial offers for possible TC 6.7-sponsored presentations and papers included: (1) work by FSEC’s Danny Parker on his zero energy housing project and (2) results of a yearlong monitoring project of the University of Colorado’s Solar Decathlon Home, which was installed on campus following the competition in D.C. Andrew Price noted that TC 4.6 (Building Operations Dynamics) has two speakers on high performance buildings (DOE, EPA) and are looking to two more speakers for a seminar in Kansas City. Although unanswered at the meeting, one or more of these topics may be an acceptable fit to the program being put together by corresponding member Todorovic.

For submittal purposes, a rank ordering of the recommended programs is required. A motion to rank the seminar on Solar Domestic Hot Water Standards and Applications as number one was (tentatively) passed (4-0-0, CV).

*Letter ballot to approve the motion: **Approved: 6-0-0, CV (2 not responding)***



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Chairman Morner and Andrew Price agreed to contact TC 2.8 (Building Environmental Impacts and Sustainability) to see if they may be interested in co-sponsoring one or both of the seminars being planned for Kansas City.

Tim Merrigan suggested that TC 6.7 seek to have ASHRAE co-sponsor the next Solar Decathlon in 2005. Co-sponsorship doesn't have to be expensive. For example, AIA was listed as a co-sponsor of the inaugural event because they provided many of the judges.

## **D. STANDARDS SUBCOMMITTEE – TIM MERRIGAN**

ASHRAE Standard 93, "MOT to Determine the Thermal Performance of Solar Collectors," and Standard 109, "MOT to Determine the Thermal Performance of Flat-Plate Solar Collectors Containing a Boiling Liquid," were released for public reviews as proposed reaffirmations. No comments were received during the public review, which ran from November 15 to December 30, 2002. Tim Merrigan submitted an edited version of the foreword for each standard. Both reaffirmed standards were approved for publication by the Standards Committee at their meeting in Chicago. A vote by the ASHRAE Board of Directors should have occurred in Chicago but no confirmation has yet been obtained.

ASHRAE Standard 96, "MOT to Determine the Thermal Performance of Unglazed Flat-Plate Liquid-Type Solar Collectors," remains in a holding pattern. The Standards Project Committee (SPC) lacks the necessary number of members. Jim Huggins chairs SPC 96P. The SPC plans to look at a full or partial adoption of ISO Standard 9806-3.

ASHRAE Standard 95, "MOT to Determine the Thermal Performance of Solar Domestic Water Heating Systems," also remains in limbo. Tim Merrigan is the chair of the SPC. The SPC voted in August 1995 to adopt ISO Standard 9459-1 to replace Standard 95 while changing two normative annexes into informative annexes. Recently ANSI has introduced new and more comprehensive procedures that cover options on adopting ISO Standards as ANSI standards. Identical adoptions and modified adoptions, as would apply to SPC 95, are now covered. ASHRAE is in the process of updating its adoption procedures to be consistent with ANSI. These updated procedures must be in place before SPC 95 can reinstate its work.

## **E. WEBMASTER – SVEIN MORNER**

Webmaster Morner noted that the TC web page has been moved to the ASHRAE server. The URL is:

<http://xp20.ashrae.org/>

Once there, click on, in order: (1) Technical Committees, (2) Technical Committees Home Pages by Section, (3) Section 6.0 . . . and (4) Solar Energy Utilization.

## **V. MEETING PLANNING**

This year, the annual ASES solar energy conference, which is co-sponsored by ASHRAE, is scheduled for Austin, Texas from June 21-25, 2003. The ASHRAE Annual meeting is being held in Kansas City, Missouri from June 28 to July 2, 2003. After a short discussion, the attendees agreed to hold its next meeting at the Annual ASHRAE meeting in Kansas City. Chairman Morner will request the same meeting schedule as provided in Chicago: (1) Handbook on Sunday from 3:00 to 5:00 pm, (2) Program and Research on Monday from 6:30 to 9:00 pm, and (3) the TC 6.7 meeting on Tuesday from 1:00 to 3:30 pm.

## **VI. OLD BUSINESS**

Chairman Morner noted that ASHRAE headquarters still sought input from TC 6.7 members on a technical question submitted by an ASHRAE member prior to the January 2002 meeting in Atlantic City. The question, "Where can I find information on solar energy and solar heating equipment," is presently identified within ASHRAE as "Frequently Asked Question #79" for which a "Quick Answer" and a "Long Answer" are available. These answers appear to be the same responses that were approved by the TC at the Atlantic City meeting, with the exception that



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they do not contain the suggested web links. These web links are recorded in the minutes from the Atlantic City meeting. Two additional web links suggested by members at the Chicago meeting are those to ASES and the US Green Building Council. Svein Morner accepted the job of reporting the web link additions to the proper ASHRAE staff member.

With regard to the ASES solar energy conference, Tim Merrigan agreed to check with ASHRAE's Bruce Hunn to see if there is anything that TC 6.7 can do at this late stage. A question was raised as to whether ASHRAE could organize and chair a session. Presenters for such a session would have to be taken from the list who have submitted abstracts for the conference.

## **VII. NEW BUSINESS**

Chairman Morner notified the attendees that ASHRAE is planning to change the section numbers of some technical committees in an effort to get better alignment and more balanced numbers within each section. At present, our TC would not be affected; it would remain in Section 6. The change is expected to take place following the June meeting in Kansas City.

Morner asked the group whether TC 6.7 should consider expanding its scopes and changing its title in order to get more people involved. Morner specifically asked whether we should cover biomass and/or wind energy. Upon looking at the titles and scopes of other technical committees, the attendees felt that biomass was already covered under TC 6.10, Fuels and Combustion. The general consensus was to not make any changes to the title or scope of TC 6.7 at this time.

The issue of possible outreach activities to the local chapters was discussed. A suggestion was made to inquire whether the US Green Buildings Council could provide a list of LEEDS rated buildings in the US and Canada. From such a list, TC 6.7 would seek to identify those projects having a solar energy component. These buildings could be reported to the local chapters for consideration as tour locations during monthly meetings. Possible assistance with communicating the information back to the applicable local chapter may be provided by ASHRAE's Technical, Energy, and Government Activities (TEGA) Committee. TEGA's primary purpose to provide a transfer of technical information between chapters and the society; TEGA assists with the planning and administration of technical activities within the chapters and with local governments. The TEGA liaison to TC 6.7 is Mark Conway ([mconway@rdgusa.com](mailto:mconway@rdgusa.com)). Attendee Kevin Cross agreed to take the lead on this effort.

## **VIII. ADJOURNMENT**

A motion to adjourn was made and accepted. Meeting adjourned at 3:25 PM

ASHRAE TC/TG/TRG ACTIVITIES SHEET

DATE: January 28, 2003

TC/TG/TRG NO.: 6.7 TC/TG/TRG TITLE: Solar Energy Utilization

CHAIRMAN : S. O. Morner VICE CHAIRMAN: T. J. Merrigan

SECRETARY: B. Dougherty

TC/TG/TRG MEETING SCHEDULE			
Location – Past 36 Months	Date	Location - Planned Next 18 Months	Date
Madison, WI (ASES)	00/06	Kansas City, MO	03/06
Minneapolis, MN	00/06	Anaheim, CA	04/01
Atlanta, GA	01/01	Nashville, TN	04/06
Washington, D.C (ASES)	01/04		
Cincinnati, OH	01/06		
Atlantic City, NJ	02/01		
Honolulu, HI	02/06		
Chicago, IL	03/01		

TC/TG/TRG SUBCOMMITTEES	
Function	Chairman
Program Handbook Standards Research	H. H. Healey M. A. Hertel T. J. Merrigan P. M. Zeigler

RESEARCH PROJECTS – CURRENT			
Project Title	Contractor	Monitoring Comm. Chairperson	Report Made At Mtg.
URP-1109 – Optimization of Hybrid PV / Thermal Solar Collector	Solar Design Associates	P. Zeigler	Project complete except for ASHRAE paper

LONG RANGE RESEARCH PLAN				
Rank	Title	W/S Written	Approved	To RAC
1.	Solar radiant heating and cooling	RTAR Submitted 03/01		
2.	Optimization and Testing of a Double Effect Solar Driven Absorption Chiller and Dual Fired Generator	RTAR Submitted 03/01		
3.	Optimization of solar thermal storage for ground source heat pump applications	RTAR to be written by Yavuzturk		



HANDBOOK RESPONSIBILITIES					
Year & Volume	Chapter	Title	No.	Deadline	Handbook Liaison
04 HVAC Systems & Equipment	33	Solar Energy Equipment		05/2003	R. Davis
07 HVAC Applications	32	Solar Energy Use		02/2005	

STANDARDS ACTIVITIES - List and Describe Subjects
<p><b>STD 93-1986P (RA 91)*</b> MOT to Determine the Thermal Performance of Solar Collectors. Public Review on Reaffirmation: 02/11/15 – 02/12/30; no comments were received. Standard 93 approved for publication by the Standards Committee on 03/01/25.</p> <p><b>STD 95-1987P*</b> MOT to Determine the Thermal Performance of Solar Domestic Water Heating Systems. SPC 95P recommended adopting ISO Standard 9459-1 (with annexes marked informative rather than normative) as the next revision of Standard 95. SPC 95P cannot move forward until the Standards Committee updates its adoption procedures to be consistent with those mandated by ANSI on how to adopt an ISO standard. TC 6.6 is co-cognizant; TC 6.7 is the cognizant (lead) technical committee.</p> <p><b>STD 96-1980P*</b> MOT to Determine the Thermal Performance of Unglazed Flat-Plate Liquid-Type Solar Collectors. SPC 96R has a chairman, Jim Huggins; a call for members was issued on 02/12/13. The SPC plans to review ISO Standard 9806-3. The SPC will have difficulty moving forward until the Standards Committee updates its adoption procedures to be consistent with those mandated by ANSI on how to conducted an identical versus a modified adoption of an ISO standard.</p> <p><b>STD 109-1986RA (RA 96)</b> MOT to Determine the Thermal Performance of Flat-Plate Solar Collectors Containing a Boiling Liquid. Public Review on Reaffirmation: 02/11/15 – 02/12/30; no comments were received. Standard 109RA was approved for publication by the Standards Committee on 03/01/25.</p> <p><b>STD 125-1992 (RA2000)</b> MOT Thermal Energy Meters for Liquid Streams in HVAC Systems. Reaffirmed in 2000. The cognizant (lead) technical committee is TC 6.1; TC 6.7 is co-cognizant.</p> <p>*NOTE: Standards 93, 95, and 96 are designated as “Proposed” rather than as a “Reaffirmation” or as a “Revision” due to exceeding the maximum time frame in which a standard may retain the ANSI designation. These standards will be sent to ANSI for their approval once they are reaffirmed/revised.</p>

<p>TECHNICAL PAPERS from Sponsored Research – Title, when presented (past 3 yrs. present &amp; planned)</p> <p>None</p> <p>TC/TG Sponsored Symposia – Title, when presented (past 3 yrs. present &amp; planned)</p> <p>None</p> <p>TC/TG Sponsored Seminars - Title when presented (past 3 years, present, &amp; planned)</p> <ol style="list-style-type: none"> <li>1. The Solar Decathlon: Results of the 2002 Competition, Jan. 2003, Chicago</li> <li>2. Applications in Solar Buildings: Combining Renewables with Energy Efficiency and Sustainability, Jan. 2001, Atlanta</li> </ol> <p>TC/TG SPONSORED FORUMS - Title, when presented (past 3 years, present, &amp; planned)</p> <ol style="list-style-type: none"> <li>1. What Can ASHRAE and Its Members Do to Increase the Use of Solar Energy?, Jan. 2003, Chicago</li> </ol> <p>JOURNAL PUBLICATIONS, when published (past 3 years, present, &amp; planned)</p> <p>None</p>
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Submitted By: \_\_\_\_\_  
 B. Dougherty