

**AMERICAN SOCIETY OF HEATING REFRIGERATING AND  
AIR-CONDITIONING ENGINEERS INC.**

1791 Tullie Circle,  
N.E.  
Atlanta, GA 30329  
404-636-8400

**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.	TC6.1	DATE	March 17, 2011
TC/TG/TRG TITLE	Steam and Hydronic Systems		
DATE OF MEETING	February 1, 2011	LOCATION	Las Vegas, NV

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL
Voting		Voting		
Steve Anthony	2007	Thomas Butcher	2007	Mark Armstrong
Tricia Bruenn	2009	John Glunt	2009	Hooman Daneshmand
Scott Fisher	2009	Torben Nielsen	2009	John Dunlap
Mark Hegberg	2008	Michael O'Rourke	2007	Hans Hansen
Trevor Houck	2010	Steven Tredinnick	2009	Chris Kerback
Julia Keen	2010			Rick Larson
Reddy Palicharla	2007			Bhumika Lathia
Corresponding		Corresponding		Asist Patel
Ramez Afify	2010	Roy Ahlgren	2009	Gay Powell
Jason Atkisson	2010	Peter Baade	2008	William Schulte
Robert Bean	2005	Donald Bahnfleth	2006	Saunders Smith
Niels Bidstrup	2009	William Bahnfleth	2007	Mike Trantham
Tom Cappellin	2010	David Bixby	1994	David Yuill
William Coad	2007	Albert Black	1987	
Kim Cross	2010	Cyrus Blackmore	2007	
Fredric Goldner	2009	Raymond Albrecht	2002	
Larry Konopacz	2008	Charles Arnold	2003	
Ken Luther	2010	Gil Avery	2006	
Michael McDermott	2010	William Bahnfleth	2007	
Frank Myers	2007	Thomas Butcher	2010	
Donald Prather	2010	Jeff Boldt	2010	
Rex Scare	2010	Michael Collarin	2010	
Greg Towsley	2009	Kelly Cramm	2006	
Edward Tsui	2010	Vikram Doshi	1996	
Robert Walker	2010	Farhad Golestan	2010	
		Wilbur Haag Jr.	1995	
		Richard Hegberg	2010	
		Martha Hewett	2009	
		Kevin Hoey	2003	

		Joseph Hoose	2005	
		Chris Jacques	2009	
		Miha Kavcic	2007	
		Jack Kersten	1996	
		Trace Laux	2010	
		Evans Lizardos	2010	
		Thomas Logan	1996	
		Kenneth Magsam	2010	
		Zoltan Magyar	2005	
		Terrence Moses	2001	
		Mark Mueller	1999	
		Marc Neufcourt	2010	
		Drew Overmiller	2008	
		Earl Rightmier	1987	
		James Rishel	2005	
		Brent Ross	2009	
		Aniruddh Roy	2008	
		James Schlachter	2006	
		Alexander Sleiman	2003	
		Donald Smiley	2003	
		Harvey Stenger	2010	
		Kevin Stuart	2010	
		Bodh Subherwal	2010	
		Joseph Thuman	1999	
		David Tree	2001	
		William Trusty	2001	
		Dennis Tuttle	1994	
		George Wallace	1998	

**All Members of TC/TG/TRG plus the following:**

T AC Section Head:	John Dunlap, PE
TAC Chair	Donald Brundage
All Committee Liaisons as Shown on TC/TG/TRG Roster	ALI/PDC - Mendy Florention
	Chapter Technology – Corey Metzger Handbook Fundamentals – Forrest Yount Handbook Fundamentals – David Yuill, PE Research - Jaap J Hogeling, ME Standards – James Vallort
Manager of Standards	Stephanie Reiniche
Staff Liason/Research/Tech Services	Michael Vaughn

## MEETING MINUTES

TC 6.1 Hydronic and Steam Equipment and Systems

Las Vegas, NV

February 1, 2011

### 1. Call to Order:

Chair Fisher called the meeting to order. The Chair welcomed all in attendance, and self-introductions were made. An attendance sheet was passed and signed by those in attendance. Secretary Walker called the roll of voting members. A quorum was present with 7 of 11 voting members present, 4 absent, and 1 non-quorum voting member absent.

**Technical Committee 6.1** is concerned with all aspects of hydronic and steam systems. This includes the application of boilers, chillers, terminal units, and all accessories and controls making up the total system as well as the design of the integrated system. In addition to comfort applications of both heating and cooling, snow melting systems are included. Cooperation with other TCs is recognized in areas such as control, noise and vibration, refrigeration, pumps and hydronic and service water piping.

### 2. Setting of the Agenda:

The Chair passed out an updated Agenda and there were no suggested revisions.

### 3. Approval of Albuquerque Meeting Minutes

Motion by Mark Hegberg, seconded by Julia Keen to approve the Albuquerque minutes. Motion passed 6-0-0 with the Chair abstaining.

### 4. Section 6 Breakfast

Chair Fisher summarized the key points of the Section 6 Breakfast (notes attached).

Chair Fisher reminded all to verify the latest entry/exit requirements to Canada as the laws have changed since Quebec City.

### 5. Sub-Committee Reports

- A. Handbook: Mark Hegberg (Chair)/Tricia Bruenn (Vice Chair). Subcommittee Meeting Minutes of January 30 and a 2012 Systems Handbook Closeout Schedule are attached.

Vote on chapters will occur prior to Montreal via conference call or letter ballot.

Hegberg called for comments on all chapters prior to February 28, 2011.

- B. Research: Tom Cappellin (Incoming Chair). Chair Cappellin noted the outstanding RTARs need to be brought back to life. Hegberg to supply Cappellin with copies of these RTARs.

Suggested future research topic is the effects of water treatment on hydronic piping and valves.

Robert Bean suggested to the subcommittee a research topic for testing and evaluating the various valve characteristics. Chair Cappellin will reply with an appropriate work statement or RTAR on this topic.

C. Membership: John Glunt (Chair) was absent. Chair Fisher reminded all to verify their current contact information.

D. Standards: Mike O'Rourke (Chair) was absent. No report available.

Chair Fisher reports Guideline 22-08 is up for renewal. M. Hegberg made a motion to reaffirm the guideline as is, seconded by J. Keen. Vote of 6-0-0 to reaffirm with the chair abstaining.

E. WEB Site: Rex Scare (Chair) Chair Fisher repeated the positive comments received regarding the web site and thanked Rex for his efforts. Chair Scare attended Google Group Webinar which will permit on line discussions prior to TC Meetings. Chair Scare felt there would be some duplication of what was already present on the website, but will investigate.

F. Chilled Water Sub Committee : Steve Tredinnick (Chair), absent. January 30 Subcommittee Meeting Minutes attached. Tredinnick asked for "vounteers" for the various sections of the proposed Chilled Water Plant Design Chapter. An interest sheet was sent around the room with volunteers indicating their interest. This will be forwarded to Tredinnick.

G. Programs: Mike McDermott (Chair). Chair McDermott reported all TC 6.1 programs were rejected for Montreal, but are being revised and re-submitted for Chicago. Attached sub-committee meeting notes and a Program and Papers Timeline for Montreal and Chicago.

H. ALI. Greg Towley (Chair): Chair Towley reported SDL 12 - The Fundamentals of Hydronic Systems self directed learning course contract revisions was awarded the contract through the Chicago meeting to Mark Hegberg. 2-3 reviewers are needed to review the content. Members Fisher and Bruenn volunteered to review.

M. Hegberg made a motion to accept the reports of the sub-committees, seconded by J. Keen. Voice vote of 6-0-0 to accept with the chair abstaining.

## **6. Liason Reports.**

A. Section Head (John Dunlap). Dunlap reviewed the Multi-Disciplinary Team (MDT) to coordinate efforts among the Technical Committees, internal committees, external societies and groups.

- B. Handbook 2009 (David Yuill). Relocation of Systems Chapter 45 reconfirmed to Fundamentals Chapter 22.
- C. 90.1 (Ken Luther). Luther supplied a 'wish list' of recommendations for the next edition of 90.1, with the idea of more ideas coming from the TCs vs. from the 90.1 Standard.

**7. Approve/Disapprove Research Projects**

No Action required.

**8. Old Business:**

- A. M. Hegberg made a motion to remove from old business the new idea on steam heating systems and water saving opportunities in steam systems, both inquiries to TC 6.1 J. Keen seconded, motion passed 6-0-0, with the chair abstaining.
- B. Response returned for the anchor force calculations from the last meeting.
- C. Standard 125-1992 was reaffirmed at the Albuquerque meeting, drop from old business.
- D. TC 6.10 work statement RP 1517 complete, delete from old business.
- E. STD 90.1 domestic water booster pump operation discussion is complete, drop from old business.
- F. M. Hegberg and S. Fisher addressed the performance standard for air/dirt separators. Item is complete.
- G. Origin of "Heating Effect" present in the current I=B=R certified ratings. Researched at Kansas State University, item complete.
- H. Boiler Efficiency Enhancements to be carried forward to next meeting. SPC 115 addresses this, however, the agreements among the committee have been breeched and the committee can't approve the draft standard for publication. The research project to develop software for this has also been placed on hold.

**9. New Business/Industry Update**

- A. W. Coad proposed revising the Hydronic System Balancing Valve and submit this revision to the Standards Sub-committee. M. Hegberg made the motion, seconded by T. Bruenn, and passed 6-0-0 with the chair abstaining.

**10. Meeting Adjournment:**

A motion was made by Mark Hegberg to adjourn the meeting, seconded by Tricia Bruenn, the motion passed 6-0-0 with the chair abstaining. The meeting was adjourned at 3:25pm.

Submitted by,  
Bob Walker.  
TC 6.1 Secretary

**AGENDA**  
**SECTION TC/TG/TRG CHAIR'S BREAKFAST MEETING**  
2011 Winter Meeting  
Las Vegas, NV

Sunday, January 30  
6:30 A.M. – 8:00 A.M. EST  
2nd Floor – North Hall – Las Vegas Convention Center

Section 1, N239 Room  
Section 4, N224 Room  
Section 7, N235 Room  
Section 10, N218 Room

Section 2, N231 Room  
Section 5, N230 Room  
Section 8, N228 Room

Section 3, N225 Room  
Section 6, N227 Room  
Section 9, N213 Room

- I. CALL TO ORDER
- II. ROLL CALL AND INTRODUCTIONS (5 minutes)
- III. ADDITIONS AND/OR CHANGES TO THE AGENDA (5 minutes)
- IV. REVIEW MINUTES/NOTES, SPECIAL ASSIGNMENTS, ACTION ITEMS FROM LAST MEETING, AND NEW ISSUES (30 minutes).  
New Assignments:  
A. To be determined
- V. IDENTIFY SHARED OPPORTUNITIES AND CHALLENGES FOR SECTION (10 minutes).  
Society Strategic Plan? Research Strategic Plan?, Handbook workshop recommendations?, etc.
- VI. REVIEW SECTION MBOs (10 minutes).  
Discuss section and TC MBOs for this year and coming year and how the section can work together to address them or establish section and TC MBOs if not already done.
- VII. DISTRIBUTE WRITTEN INFORMATION AND REQUESTS FROM SOCIETY LIAISONS TO TC/TG/TRG CHAIRS (30 minutes).  
Additional Announcements/Reminders:
  1. 2010-2011 Hightower Award Recipient – Gary Phetteplace, TC 6.2 & 6.8
  2. 11-12 Roster update process & TC input deadline
  3. TC/TG/TRG Chair's Training Workshop Reminder
  4. Location of Section Head Mailboxes at this Society meeting
  5. Upcoming Advanced Energy Design Guide (AEDG) Broad Peer Reviews
  6. Special effort to welcome new members, and visitors (potential members), particularly international members, to TC meetings
  7. Useful TC/TG/TRG Chair Information on ASHRAE website
  8. Status on Tech. Council Steering Committees (BIM, AEDGs, Bldg. Performance Metrics).
  9. CEC proposed or recently implemented technical program changes
  10. Report on TC/TG/TRG websites in Section (SHs need to report to TCs which sites are not up to date.)
  11. ASHRAE Google Groups/Sites tools for TCs/TGs and TRGs
  12. Send requests in for new "Help Wanted" section on technical committee page of ASHRAE website
  13. Option for TC Subcommittee Meetings via Conference Calls and Web Meetings
  14. Upcoming Program Submission Dates
  15. Upcoming Conferences/Workshops
  16. Border Entry/Exit Requirements for 2011 Annual Meeting in Montreal, Canada
- VIII. REMARKS FROM SOCIETY LIAISONS TO TC/TG/TRG CHAIRS  
Liaison members from Research Administration, ASHRAE Program, Handbook, Standards, and other standing committees will have an opportunity to describe their committee activities that relate to the TC/TG/TRG functions, if time permits. Written announcements must be provided as a minimum by liaisons in order to have an opportunity to speak at this meeting.

ADJOURN



**Announcements and Reminders for TC/TG/TRG Chairs  
Las Vegas 2011**

**1. 2010-2011 Hightower Award Recipient – Gary Phetteplace, TCs 6.2 & 6.8**

Dr. Phetteplace is being honored by TC 6.8 for recently chairing an ad hoc committee to help resolve a difference of opinion in content to the geothermal chapter of the Applications Handbook for 2011. Gary supported TC 6.2 by completing a major restructure and edit of chapter 11 of the 2008 Systems & Equipment handbook. He was also named as a significant contributor to the 1996-2008 editions of the HVAC Systems Handbook. He is a great example of a TC member going the extra mile by attending numerous district energy conferences in order to stay current and brief the TC and by attending all TC 6.2 subcommittee meetings.

**2. 10-11 Rosters update process and process for adding provisional CMs**

Remember, the 2010-2011 Roster is in effect until after the June meeting this year. The new rosters for 2011-2012 will go into effect on July 1, 2011 based upon the update information that each TC or TG turns into their section head at this meeting by midnight, Tuesday, 2/1/11. Please see your section head for the 2011-2012 Roster Update form if you still need a copy.

By now, each TC chair should have received a PDF & MS-Excel file of their 2010-2011 roster from their Section Head for distribution to the TC. In addition, each member can view all of the rosters of their committees on the ASHRAE Website. Go to [www.ashrae.org](http://www.ashrae.org) <<http://www.ashrae.org>>, click on the "Membership" tab in the header, click on "Manage Your Membership" text in the left sidebar, and log in (if you have not logged in lately, you might need to set up a new username and password). Click on the "Biographical Record System" link. Now, you should see your current "bio info". Click on "My Committees" on the left sidebar; all of the committees you are a member of will appear. Click on the "blue" roster text at the left hand side of a committee to reveal the roster with linked contact information. Make sure everyone on your committee also knows how to access the roster.

The Provisional Corresponding Member position was created for TC/TG/TRG rosters last year. This position allows potential new members to be added by staff to the committee roster any time a request for membership is made by an individual. The position has a 2-year term on the committee. Staff will notify the chair and reissue a new roster to the committee any time a provisional member is added. The TC/TG/TRG chair has the option each year during the regular roster update process to convert provisional CMs that have been active participants on the committee the past year into regular CMs or voting members or drop them.

**3. TC/TG/TRG Chair's Training Workshop Reminder**

Sunday, January 30<sup>th</sup>, 9:45-10:45a in the Las Vegas Hilton Hotel, Pavilion 6 Room (1<sup>st</sup> floor level). As with the Breakfast meeting, both the Chair and Vice-Chair are expected to attend; attendance will be tracked so that we can assess who has been trained. Bring questions - if you need an answer, it's quite likely others also need the same answer. This particular session will also include at the beginning a brief presentation and Q&A session with the chair of the Conferences & Exhibitions Committee (CEC) chair, Bill Dietrich, concerning the meeting technical program and recent or planned changes to it.

*MDT - Multi-disciplinary Team  
Members from appropriate TC  
Set up to integrate solution across  
multiple internal committees & societies and groups*



4. **Location of Section Head Mailboxes at this Society meeting & Free Wi-Fi Access**  
Just outside ASHRAE Headquarters Office (Conference Rooms #1-3 – 1st floor – Las Vegas Hilton).

This Society meeting only we will also have free Wi-Fi access in all meeting rooms of the Las Vegas Convention Center that we will be using.

5. **Upcoming Advanced Energy Design Guide (AEDG) Broad Peer Reviews**

The following four reviews are planned between now and the annual meeting:

- February 14 through Feb 25  
Energy Efficiency Guide for Existing Commercial Buildings: Technical Implementation – 60% Draft
- February 21 through March 4  
50% Advanced Energy Design Guide for K-12 School Buildings – 60% Draft
- April 18 through April 29  
Performance Measurement Protocols: Best Practices Guide – 60% Draft
- April 25 through May 6  
50% Advanced Energy Design Guide for K-12 School Buildings – 90% Draft

All dates listed above are subject to slight adjustment. Please check the AEDG section of the ASHRAE website at the following link for the latest information:  
<http://www.ashrae.org/technology/page/938>

6. **Welcome All Visitors to your TC meetings**

Potential new members for your committee have been encouraged to drop-by your meeting in Las Vegas. As a result, please make a special effort to recognize and warmly welcome all visitors to your meeting – A TC can never have too many willing and able volunteers.

7. **Useful TC/TG/TRG Chair Information and forms on ASHRAE website**

Information for TC/TG/TRG chairs can be found on the Technical Committee page of the ASHRAE website at the following link: <http://www.ashrae.org/technology/page/104>.

The Section Breakfast for TC/TG/TRG Chairs/Vice-Chairs is Sunday, January 30th, 6:30-8:00a in the North hall of the Las Vegas Convention Center (2nd floor); specific room assignments are listed in the "TC/SPC Meeting Schedule" for Las Vegas at <http://www.ashrae.org/events/page/1925>. Both the Chair and Vice-Chair are expected to attend. Please arrive early if you would like to have breakfast. An agenda will be distributed Saturday evening, January 29 (after TAC meets earlier that day). The meeting will include the opportunity to interact with liaisons from Society standing committees (Handbook, RAC, etc.) and in some cases Society leadership.

Please make sure that your Research Subcommittee Chair attends the Research Subcommittee breakfast on Monday, January 31st at 6:30 a.m.-8:00 a.m. in the Las Vegas



Hilton Hotel, Ballroom A (1st Floor level). A large portion of the meeting will be dedicated to training and interface time with your Research Liaison

**8. Status on Tech. Council Steering Committees (BIM, AEDGs, Bldg. Performance Metrics)**

A new heading entitled "Current Technical Focus of Society" has been added to the ASHRAE website "Technical Committee" page with links to information on the activities and plans of the new Tech. Council Steering Committees on Building Information Modeling (BIM), Advanced Energy Design Guides (AEDGs), Building Performance Metrics, and Building Safety and Security as well as ASHRAE Special Projects.

**9. CEC proposed or recently implemented technical program changes**

- Badge scanning is being implemented at this meeting for the first time to track continuing education credits for each attendee.
- Nearly all the sessions at this meeting qualify for New York State PDH credits. CEC hopes to do the same in the future for USGBC credits.
- All Society technical programs going forward will include the following two broad tracks in order to provide space for almost any high-quality TC program submitted:
  - HVAC&R Fundamentals & Applications
  - HVAC&R Systems & Equipment
- The eight tentative tracks for the 2012 Annual Meeting in San Antonio are as follows:
  - Alternate Technologies
  - Integrated Energy Systems
  - Indoor Environmental Applications
  - Building Modeling Applications
  - Specialized Applications –Archival Museum & Assembly Spaces
  - Refrigeration Applications
  - HVAC&R Systems & Equipment
  - HVAC&R Fundamentals & Applications
- CEC has offered to work with TC Program Chairs to help improve the quality of their abstracts prior to their formal submission to CEC in order to improve its chances for acceptance. Please encourage your Program Chair to stop by the Speaker's Lounge at any Society meeting to meet with CEC members for this purpose.

**10. TC/TG/TRG Websites**

Is your committee website up to date? If not, please ask your webmaster to at least post the latest minutes and Las Vegas meeting times and agenda. If your website has been neglected, add an action item for this meeting to appoint a responsible member of the TC/TG/TRG who will bring it back to life. This form of communication is critical to the efficient operation of your committee, and for attracting new members.

TAC and the Electronic Communications Committee (ECC) plan to stage a webinar this spring on how to set-up and maintain a basic TC website using the ASHRAE server and TC website template. Watch for future announcements concerning this webinar.

**11. ASHRAE Google Groups/Sites tools for TCs/TGs and TRGs**

Another tool that ECC is recommending that TC's use for their online collaboration space instead of a password protected "Members Only" folder on their TC website is Google



Groups/Sites. Among other benefits, all members of the Google Sites can post new information to the group site instead of just the TC webmaster.

TAC and the Electronic Communications Committee (ECC) staged two webinars this past fall on how to set-up and maintain a basic ASHRAE Google Group/Sites. A copy of the training presentation is posted on the Technical Committee page of the ASHRAE website at the following link under the heading Procedures, Forms and Information for TCs/TGs, and TRGs: <http://www.ashrae.org/technology/page/104>.

**12. New "Help Wanted" section for TCs to be Added to ASHRAE Website**

A new "Help Wanted" section will be added to the Technical Committee page of the ASHRAE website so that TCs can advertise requests for help. Requests could include calls for new members, a webmaster, reviewers and contributors for a handbook chapter or special publication, special expertise that resides outside the TC, equipment donors for a research project, etc. Requests should be for needs that need to be fulfilled within the next 6-12 months. Chapter Technology Transfer Committee (CTTC) will assist in this effort by making sure ASHRAE chapters are aware of this request list. Please pass on any requests for your TC to the Manager of Research and Technical Services, Mike Vaughn, at [mvaughn@ashrae.org](mailto:mvaughn@ashrae.org) or [MORTS@ashrae.net](mailto:MORTS@ashrae.net)

**13. Option for TC Subcommittee Meetings via Conference Calls and Web Meetings:**

More and more TCs are taking advantage of a new Society service that allows TCs to hold subcommittee meetings by phone and/or web. Many TCs are finding this to be a more efficient way for them to conduct subcommittee business and it also allows TC members that can't travel to meetings on a regular basis a way to still contribute to the TC. Such a change can also eliminate potential conflicts with the TC's program sessions at Society meetings. Please pass your conference call/web meeting/webinar requests on to the Manager of Research and Technical Services, Mike Vaughn, at [mvaughn@ashrae.org](mailto:mvaughn@ashrae.org) or [MORTS@ashrae.net](mailto:MORTS@ashrae.net)

**14. Upcoming Program Dates**

**Montreal Meeting - June 25-29, 2011**

- Theme: Net-Zero Buildings
- Montreal Seminar and Forum Sessions are due February 14, 2011
- Final Technical Papers & Full Conf. Papers are due March 7, 2011
- Conference Website with Track Grid: [www.ashrae.org/montreal](http://www.ashrae.org/montreal)

**Chicago Meeting - January 21-25, 2012**

- Theme: The Impact of HVAC&R on our Daily Lives
- Full Technical Papers & Conf. Papers abstracts are due April, 18, 2011
- Chicago Seminar and Forum Proposal accepted starting June 3, 2011
- Conference Website: [www.ashrae.org/chicago](http://www.ashrae.org/chicago)

**San Antonio Meeting - June 23-28, 2012**

- Theme: Program themes have been eliminated starting with this conference
- Full Technical Papers & Conf. Paper abstracts are due TBD
- San Antonio Seminar and Forum Proposals are due TBD
- Conference Website: TBD



**15. Upcoming Forums, Workshops and Conferences**

- Next –Generation, Low Global Warming Potential (GWP) Refrigerants Forum, this Tuesday, February 1, 2011, 8:00-9:30 am, Las Vegas Convention Center, Room N256 – This forum is not listed in the ASHRAE meeting program.
- Energy Modeling: Tools for Designing High Performance Buildings, April 4-6 2011, Atlanta, GA: <http://www.ashrae.org/energymodeling>
- 10th IEA Heat Pump Conference 2011, May 16-19 2011, Tokyo, Japan, [www.hpc2011.org](http://www.hpc2011.org)
- XIV European Conference, Part 2: Latest Technologies in Renewable Energy and Applications in Heating & Cooling, June 10-11, 2011, Milan, Italy - <http://www.EUenergycentre.org>
- ECOS 2011 (24th Intl Conference on Efficiency, Cost, Organization, Simulation & Environmental Impact of Energy Systems), July 4-7, 2011, Novi Sad, Serbia - <http://www.ecos2011.com>

**16. Border Entry/Exit Requirements for 2011 Annual Meeting in Montreal, Canada**

Entry/Exit requirements for Canada have changed since the 2006 Annual meeting in Quebec City, Canada. Please encourage all members for your TC/TG or TRG that may attend the next Society meeting to check now the latest entry/exit requirements for Canada using the following link and to make sure their passport or other entry paperwork is up-to-date with these new requirements:

[http://www.travel.state.gov/travel/cis\\_pa\\_tw/cis/cis\\_1082.html#entry\\_requirements](http://www.travel.state.gov/travel/cis_pa_tw/cis/cis_1082.html#entry_requirements)

PDC

Feb 14 - program

April 18 - abstracts

Energy modeling workshop



**Attendees:**

Mark Hegberg  
Mike McDermott  
Scott Fisher  
Bob Walker  
Tricia M. Bruenn  
William A. Schulte, PE RS&H  
Rex Scare  
Ken Luther  
Don Bahnfleth  
Julia Keen  
Niels Bidstrup  
Ramez Afify  
Steve Treddnick  
Larry Konopacz  
Greg Towsley  
Peter Thompson  
Edward Tsui

Forrest Yount – Liaison

Schedule		Due Date	Responsibility
Ch No	Short Title		
10	Steam	3/14/11	R. Scare
12	Hydronic Htg & Cooling	3/28/11	M. Hegberg
13	Condenser Water Sys.	4/11/11	S. Tredinnick
14	Med./High-Temp. Water Htg	4/25/11	D. Bahnfleth
31	Boilers	05/9/11	E. Lizardos
43	Centrif. Pumps	5/16/11	N. Bidstrup
27	Unit Ventilators	5/23/11	Sent to 5.3
35	Hydronic Heat Dist. (Radiators)	6/6/11	D/M Hegberg
45	Pipes, Tubes, Fittings (Will roll into Fund 36)	6/13/11	M. Hegberg
46	Valves	6/20/11	M. Hegberg
47	Heat Exchangers	7/4/11	J. Glunt

<b>Some Responsibilities have changed – 2/1/11.</b>  <b>Unit Ventilators – Schires (Chapter 27)</b> <b>Hydronic Heat – Stille (Chapter 35)</b> <b>Pipes, Tubes, Fittings – Fisher (Chapter 45)</b>		
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Notes:

- 1) See above for due dates.
  
- 2) Rules of Submission
- 3) After complete and voted on by committee, complete check-list. Send each chapter separately to Forrest Yount ([Forrest.Yount@carrier.utc.com](mailto:Forrest.Yount@carrier.utc.com)) and CC Mark Owen ([mowen@ashrae.org](mailto:mowen@ashrae.org)) and Heather Kennedy ([hkennedy@ashrae.org](mailto:hkennedy@ashrae.org)).
  - a. Send the IP and SI versions if available or combined if it is on Handbook Central this way.
  - b. Send separate files for the charts/graphs
  - c. Ask for permissions from any copyrighted material- even if not changed.
  - d. Note on checklist if another chapter is referenced so that the editorial staff sees this. The chapter numbers may change.
  
- 4) There is no due date for electronic content – submit after committee vote.

# TC 6.1 2012 Systems Handbook Closeout Schedule

				January	February	March	April	May	June	July
10 Scare	Steam	3/14	Complete			→				
12 Hegberg	Hydronic Htg & Cooling	3/28	Re-type example			→				
13 Tredinnick	Condenser Water Systems	4/11	Complete				→			
14 Bahnfleth	Med./High-Temp. Water Htg.	4/25	Complete				→			
31 Lizardos	Boilers	5/9	Complete					→		
43 Bidstrup	Centrifugal Pumps	5/16	Complete					→		
27 Schires	Unit Ventilators	5/23	New Reviewer					→		
35 Stille	Hydronic Heat Dist.	6/6	New Reviewer					→		
45 Fisher	Pipes, Tubes, Fittings	6/13	Complete						→	
46 Hegberg	Valves	6/20	Add FCI 70						→	
47 Glunt	Heat Exchangers	7/4	Complete							→

Mark Hegberg: [mhegberg@comcast.net](mailto:mhegberg@comcast.net)



# MASTER

## TC 6.1 Chilled Water Plant Sub-Committee Las Vegas, NV Winter Meeting

### Topic – New ASHRAE Chilled Water Plant Design Chapter for Systems Handbook

#### ACTIONS TO DATE:

- 6/28/2010 – Prior to departing Albuquerque (before the main TC 6.1 meeting) Steve T forwarded the Table of Contents to TC 6.1 with the intention that the TC would approve via vote and then the final Outline of the Table of Contents would be forwarded to Mike Owen and Rus Lindemann for direction on how to proceed.
- Did not hear back until mid-October 2010 that the above probably did not occur. Mid-November timeframe, discussion with Mark Hegberg resulted in decision that we should start the chapter and if content is pertinent; it will be added into the Handbook in some fashion.
- Due to work obligations, Steve T has not progressed on this chapter. The intent is still there but traction and progress was lost.
- District Cooling Design Guide is progress. Steve T is currently reviewing an 80 to 85% completed edition that was received 1-27-11. There may be text within this guide that could be used in the chilled water plant design chapter. Stay tuned.

The following is the proposed outline that was submitted in Albuquerque on June 27, 2010. Some folks have expressed interest in assisting with the effort and are noted in the outline.

Chapter Topic	"Volunteer" or responsible party
<b>Scope and Purpose of Chapter</b> To create a chapter that walks the design engineer step by step through the process of selecting and sizing equipment in a chiller plant. Identified size range is between 200 and 2000 tons that could have single or multiple chillers mostly focusing on water cooled plants.	STEVE, I'LL HELP ON WHATEVER YOU NEED HELP ON. M. HEGBERG.
<b>Conceptual System Planning</b> Design Temperature Selection – existing, new System Design Pressures and materials Spatial Planning – where are things going, maintenance requirements, mono rail, over head crane rails, davits, etc. Implications of Thermal Storage on spatial requirements or equipment selection Plant layout – maintenance requirements, future requirements Plant architectural issues Acoustics, aesthetics, coordination with architect, fire walls and ratings, louvers, roof penetrations, etc. Load Definition – what is the max and the min – use ASHRAE HQ Sizing for future requirements Investigation into utilities and costs Sizing Chillers per Load Profiles – peak day and annual Early Procurement of Equipment? Redundancy Diversity	Ben Schulte MIKE MODERWITT Hooman Dareshtmand



Chapter Topic	"Volunteer" or responsible party
<b>Chillers</b> Chiller Technologies – centrifugal, screw, absorption, etc. Research how this interfaces with existing chapters on chiller technology ( <i>do we get into aircooled chiller plants?</i> ) Refrigerants – HFC, HCFC, Li-Br, ammonia, propane, etc. (ASHRAE Standard 34) Prime Drivers – electric, steam, engine, variable frequency drives When to use and how to calculate the economics Open Drive & Hermetic Magnetic Oil-less Compressors drives Chiller configuration – parallel, series, series-counterflow, piggyback, heat recovery, tempifiers, ground source heat rejection (heat pump), etc. Accessories – marine water boxes, RTDs, VFDs, davits, etc. Operational Limitations – low and high end conditions when varying flow	<i>Bruce Schuch</i> <i>Edward Tsui</i>
<b>Evaporator and Condenser</b> Water temperatures and impact on system efficiencies Tube Materials Number of Passes	
<b>Heat Rejection</b> <i>Air Cooled?</i> Water Cooled Open Circuits Cooling Towers Surface Water – River water, lake water and Seawater Reclaimed water Closed Circuits Ground water – wells Air Cooled Radiators? Refrigerant Circuits Evaporative Condensers	
<b>Pump Selection</b> Configurations – manifolded pumps vs. individual chiller pumps Pumping Schemes Primary only Variable Flow Primary Primary Secondary (constant/variable) Pump head Voltage limitation (480V or 4160V)	Torben Nielsen Ken Luther
<b>Control Theories?</b> Complexities of larger chiller plants	Torben Nielsen <i>Edward Tsui</i>
<b>System Issues</b> Minimum Water Volume	<i>RAMEZ AFIFY</i>



Chapter Topic	"Volunteer" or responsible party
Plants with Multiple Chillers – pressure drops, start/stop Low Delta T Syndrome impact on plant Free Cooling – parallel and series Water Treatment and conservation Filtration Startup and Commissioning? Long term operational and maintenance requirements	Ken Luther
<b>Codes, Standards and Guidelines regarding High Performance and Safety</b> Plant Efficiency Minimum energy requirements per ASHRAE 90.1 Chillers, pumps, cooling towers, VFDs, controls, etc. Heat reclamation Guideline 22 Standard 189 Chiller Testing – Factory and Field – ARI Standard 550/590 LEED Credit Plant Safety Chiller Room Ventilation Standards (ASHRAE Standard 15)	Julia Keen Ken Luther TREVOR HOUCK
<b>Questions and Action List:</b> <ul style="list-style-type: none"> <li>Is the ASHRAE HQ load information available in eQuest or Trane Trace????</li> <li>Confirm overlap with other Chapters</li> <li>Recruit authors from vendors?</li> </ul>	Tredinnick

*It is recognized that this may have overlap with existing handbook chapter materials. It is intended to use all existing information as background references for this new chapter. A quick perusal of the Handbooks has revealed the following Potential Overlapping Chapters:*

## 2008 HVAC SYSTEMS & EQUIPMENT

**Chapter 3** – Central Cooling and Heating (TC 9.1). Very broad brush chapter. This has some information on primary variable flow and primary-secondary pumping systems and major equipment.

**Chapter 11** – District Energy (TC 6.2). A little overlap on pumping systems and plant layout.

**Chapter 12** – Hydronic Heating and Cooling System Design (TC 6.1). Will overlap with methods of design, hydraulic components and pumping configurations, preliminary equipment layout. Perhaps just add it to this chapter????

**Chapter 38** – Condensers. Describes evaporative condensers and chiller condenser side.

**Chapter 39** – Cooling Towers. Describes cooling tower types and applications including maintenance.

**Chapter 42** – Liquid Chiller Systems (TC 8.1 & 8.2). Covers chiller types, refrigerants and controls.

**Chapter 43** – Centrifugal Pumps (TC 6.1). Overlap on pumping configurations



Proposed TC6.1 Hydronic Steam Heating Equipment Systems Program Plan			
Year	2012		
Date	June 25-29	Jan 21-25	June 23-27
City	Montreal	Chicago	San Antonio
Theme	Net-Zero Buildings	High Performance Buildings	TBD
Tracks	<a href="http://www.ashrae.org/montreal/">www.ashrae.org/montreal/</a> Refrigeration HVAC Systems Net Zero Applications & Fundamentals Professional Skills Eng Tools Commissioning Alternative Technology	<a href="http://www.ashrae.org/chicago/">www.ashrae.org/chicago/</a> Energy Efficiency - New Technologies and Applications - Kelly Cramm Integrated Design Specialized Applications - Healthcare, Laboratories and Data Center Energy Modeling Applications Installation, Operation & Maintenance of HVAC Systems High Performance Buildings - Mike McDermott HVAC & R Systems and Equipment Professional Skills HVAC & R Fundamentals and Applications - Julia Keen Refrigeration	<a href="http://www.ashare.org/sanantonio/">www.ashare.org/sanantonio/</a> HVAC & R Systems and Equipment Professional Skills HVAC & R Fundamentals and Applications Refrigeration
Technical Paper	Paper: September 17, 2010	Paper: April 18, 2011	
Title			
Session			
Conference Paper	Abstract: Oct. 9, 2011; Paper: Jan. 9, 2011	Abstract: April 18, 2011; Paper: July 8, 2011	Abstract: Oct. 9, 2011; Paper: Jan. 9, 2012 (Tentative)
Title		Anchor Force	
Name		Scott Fisher	
Abstract (Accepted: Yes/No)			
Paper			
Session			
Title		A new Analysis of Pressure Independent control Valves	
Name		Bob Walker	
Abstract (Accepted: Yes/No)			
Paper			
Session			
Title		Classic control valve selection for water systems	
Name		Mark Hegberg	
Abstract (Accepted: Yes/No)			
Paper			
Session			
Seminar	Proposal: February 14, 2011	Proposal: August 12, 2011	Proposal: February 14, 2012
	Certification Programs - Mark Neufcourt	High Temperature Hot Water - Ken Luther	Building Assessments of Hydronic Systems- Greg Townley
	Boiler, Valve and Pump Selection - Trica Bruenn	Steam Systems - Rex Scare and Bill Code	Impact of ASHRAE Stds on Hydronic Design - Julia Keen/Mike McDermott
	High Temp Chilled Water and Low Temp Heat - Mike McD		
Forum	Proposal: February 14, 2011	Proposal: August 6, 2011	Proposal: February 14, 2012
	How Do ASHRAE Standards Impact Hydronic Design? - Julia and Mike	Are steam heating systems sustainable or prehistoric? Bill Coad and Mike	
Submittal Deadline			

#### Future Topics Ideas:

RP1196 Software Development of Boilers  
 Vacuum Steam Systems  
 Making the Case from Air to Hydronic HVAC Systems  
 Adapting High Temperature Heating Components with High Efficiency Low Temperature Heating Systems in Cold Climates  
 One Pipe Hydronic Geothermal Heat Piping Systems  
 Exploring The Energy Conservation Benefits of Combining Hydronic and Variable Flow Refrigerant Hvac Systems  
 Exploring Energy Conservation and IAQ benefits of a High Temperature Radiant Cooling Systems with Dedicated Outside Air and Geothermal  
 Energy Efficiency and IAQ Retrofit Case Studies of Historic University Buildings served by Campus Central Heating and Cooling  
 Energy Efficiency Retrofit Case Studies of Central Steam Heating Plants in Cold Climates  
 System Selection Design for Commercial, Industrial and Health Care Applications  
 Part Load Performance of Chilled Water Coils  
 Will piping Insulation failures eliminate low Temp CHW?  
 What are the effects of valve leakage?

## **LAS VEGAS MEETING MINUTES**

### **PROGRAMS SUBCOMMITTEE**

#### **ASHRAE TC 6.1 “HYDRONICS AND STEAM HEATING EQUIPMENT AND SYSTEMS”**

A. Meeting called to order at 2:15 pm, 31 Jan 2011 at Hilton Las Vegas Pavilion 11, by Mike McDermott

B. Members and Visitors in attendance

	Name	Position
1.	Mike McDermott	Programs Subcommittee Chair
2.	Julia Keen	Vice Chair
3.	Rex Scare	Web Master
4.	Ken Luther	Member
5.	Niels Bidstrup	Member
6.	Scott Fisher	Chair
7.	Tricia M. Bruenn	Member
8.	Bob Walker	Secretary
9.	Rex Scare	Web Master
10.	Tom Cappellin	Research Subcommittee Chair
11.	Greg Towsley	Member
12.	Bill Coad	Member
13.	Dave Delaquila	Visitor-Observer
14.	Hooman Daneshmand	Visitor-Observer
15.	Ramez Afify	Visitor-Observer

C. Current and future programs were discussed.

1. ASHRAE has revised and continues updating the process of applying for future programs. This process was explained by Julia Keen who is currently serving on ASHRAE Conference and Exposition (CEC) Committee.
2. Feedback from CEC on program submittal success
  - a. Connect with hot topic track and add WOW factor
  - b. Add more detail to abstract
  - c. Focus on our strength – Seminars for Practitioners
3. Programs are now classified in the following formats with typical sources of program:
  - a. Technical Papers – 30 pages - Academia
  - b. Conference Papers – 8 pages - Academia and Practitioners
  - c. Seminars – PowerPoint - Practitioners
  - d. Forums - Practitioners
4. For detailed information on how the above programs as to be assembled and submitted visit ASHRAE's web site for information and direction. See example Forum I submitted last night:

[www.ashrae.org/montreal/](http://www.ashrae.org/montreal/)

<http://ashraem.confex.com/ashraem/s11/cfp.cgi>

Title:

**How will ASHRAE Standards affect Future Hydronic System Design?**

Overview:

**The purpose of this forum is to explore how the ASHRAE Standards 189.1 and 90.1 affect hydronic system design. We seek input from HVAC designers to determine best practices to meet the goals for the design of high performance green buildings. Early hot water systems used very large pipes because it was thought this was necessary to ensure adequate circulation and heat retention. We then moved to high temperature hot water and steam to minimize pipe size and project costs. Do we go now back to low temperature hot water systems with the larger pipe size? Have we hit an energy reduction plateau at 25 KBTU/sq ft annually with our current technologies or can we go lower?**

Technical Committee:

**06.01 Hydronic and Steam Equipment and Systems**

Expected Attendance:

**50**

Program Track:

**HVAC Systems and Equipment**

Program Level:

**Intermediate**

Program Type:

**Forum**

Length:

**60**

Special Request or Comment:

**Please coordinate time slot with TC-6.1 committee meetings.**

**A. Chair**

Bill Coad, P.E.

Coad Engineering Enterprises

St Louis, MO

**Email:** [wjcoad@coadengineering.com](mailto:wjcoad@coadengineering.com)

**Member Grade(s):** Presidential Fellow Life Member

**Experience:** William J. Coad, President of Coad Engineering Enterprises is a consulting principal and past Chairman/CEO of The McClure Corporation (dba McClure Engineering Associates). Mr. Coad was President of the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) in 2001-2002. He received his degree in Mechanical Engineering from Washington University in 1957. Prior to forming Coad Engineering Enterprises, Inc., he had been with McClure Engineering Associates, a Mechanical/Electrical Consulting Firm, for 40 years (following five years as a design engineer, estimator, and corporate officer of a mechanical contracting company). He is a registered professional engineer in 38 states. He is a member of the Board of Directors of Mestek Corporation of Pittsburgh, Pennsylvania, Exergen Corporation of Watertown, Massachusetts, and the National Institute of Building Sciences (NIBS) of Washington D.C. As an educator, Mr. Coad served as a Lecturer in Mechanical Engineering for 12 years at Washington University in St. Louis. For 17 years he was



an Affiliate Professor at Washington University, teaching graduate courses in Mechanical Engineering and serving as a thesis advisor in building environmental systems design. Mr. Coad is a member of the Consulting Engineer's Council, the American Society of Mechanical Engineers (ASME) and a Fellow in the American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE). His positions in ASHRAE have included terms as President (2001-2002), Vice President, Treasurer, and member of the Society's Board of Directors. He has also served on numerous Technical Committees and Task Groups, on the Nominating Committee, the Presidential Committee on Energy Resource Evaluation, Panel 12 Standard 90-75, Finance Committee, Energy Council, Technology Council, Members Council, Publishing Council, Research & Technical Committee, Education Committee, and the Continuing Education Committee. (Often, he has served as Chairman or Vice Chairman of the above committees and councils). He served in all offices of the St. Louis Chapter of ASHRAE, (President, 1971-72). Mr. Coad received the Society's Distinguished Service Award in 1980, the Crosby Field Award for the best paper published by ASHRAE in 1985, the Louise & Bill Holladay Distinguished Fellow Award in 1989, the award for Best Journal Article (1991), ASHRAE's highest award for technical achievement, the F. Paul Anderson Award in 1996, the Exceptional Service Award in 2001, and the Andrew T. Boggs Service Award in 2002. Mr. Coad is an Honorary Member of Pi Tau Sigma (Mechanical Engineering Honorary Society), a (1992) recipient of the Washington University Alumni Achievement Award, and the (2001) recipient of the Donald Julius Groen Prize of the British Institute of Mechanical Engineers (ImechE). He has published several Symposium Papers and has authored numerous articles on Engineering Philosophy and Building Environmental Systems (including, for 15 years, a monthly column entitled "Fundamentals to Frontiers" in HPAC Engineering Magazine). William Coad authored "Energy Engineering and Management for Building Systems," published by Van Nostrand Reinhold, and is a co-author of "Principles of Heating, Ventilating, and Air Conditioning" published by ASHRAE. He is a member of the Editorial Advisory Board of HPAC Engineering Magazine. He has served on the St. Louis Professional Code Committee, and the Missouri State Building Code Steering Committee. Mr. Coad has been Chairman of the Building Technology Advisory Committee to the Missouri Energy Agency, a member of the Building and Grounds Committee of the Washington University Board of Trustees, the Board of Directors of St. Elizabeth Academy in St. Louis, and the Energy Conservation Committee of the American Consulting Engineer's Council.

## B. Presentations

Presentation	Speakers	Status
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**If necessary, you can make changes to your session between now and the deadline of**

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- To access your submission in the future, use the direct link to your session submission from one of the automatic confirmation emails that were sent to you during the submission.

- Or point your browser to <http://ashraem.confex.com/ashraem/reminder.cgi> to have that URL mailed to you again. Your username/password are 4664/738050.

Any changes that you make will be reflected instantly in what is seen by the reviewers. You DO NOT need to go through all of the submission steps in order to change one thing. If you want to change the title, for example, just click "Title" in the session control panel and submit the new title.

When you have completed your submission, you may close this browser window.

5. The programs for Las Vegas are fully subscribed. TC 6.1's future programs should be concentrated on Montreal and beyond.
6. The program schedule for Montreal is as shown below:

**June 25 – 29, 2011**  
**Montreal, Quebec, Canada**  
[www.ashrae.org/montreal](http://www.ashrae.org/montreal)

**2011**  
 Feb. 14 — Program Proposals Due  
 Feb. 21 — Conference Papers Accept/Reject Notifications  
 March 14 — Final Technical Papers Due  
 March 14 — Final Conference Papers Due  
 March 18 — Notifications of Program Accept/Reject Distributed  
 May 6 — Upload of PPTs Begin  
 June 6 — All Program PPTs Due Online  
 June 25 — Speaker's Lounge Opens

**January 28-February 1, 2011**  
**Montreal, Quebec, Canada**  
<http://www.ashrae.org/chicagohttp://www.ashrae.org/events/page/2650>

**2011**  
 April 9 — Technical Papers Due for Review  
 April 9 — Conference Paper Abstracts Due  
 May 7 — Conference Paper Abstract Accept/Reject Notifications  
 June 4 — Web Site Opens for Seminar and Forum Proposals  
 Aug. 6 — Conference Papers Submitted for Review  
 Aug. 6 — Program Proposals Due  
 Sept. 3 — Conference Papers Accept/Reject Notifications  
 Sept. 17 — Notifications of Seminar and Forum Accept/Reject Distributed  
 Sept. 24 — Final Technical Papers Due  
 Sept. 24 — Final Conference Papers Due  
 Dec. 10 — Upload of PPTs Begin

**2012**

Jan. 14 — All PPTs Due Online  
Jan. 29 — Speaker's Lounge Opens

7. Persons wishing to organize and submit program requests need to review ASHRAE web site information and submit in accordance with the instructions provided. Once submitted, the information should be sent to the Program Sub-chair for inclusion in future committee meeting agendas.
- D. General issues concerning program activities and concerns were discussed
- E. Adjournment of subcommittee at 4:15 pm.