

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

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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.	TC6.1	DATE	August 3, 2012
TC/TG/TRG TITLE	Steam and Hydronic Systems		
DATE OF MEETING	June 26, 2012	LOCATION	San Antonio, TX

MEMBERS PRESENT	YEAR APPT	MEMBERS ABSENT	YEAR APPT	EX-OFFICIO MEMBERS & ADDITIONAL PRESENT
Voting		Voting		
Jason Atkisson	2011	Ramex Afify	2011	John Dunlap
Tricia Bruenn	2009	Trevor Houck	2010	Steve Hancock
John Glunt	2009	Ken Luther	2011	David Yuill
Julia Keen	2010	Steve Tredinnick	2009	
Michael McDermott	2011			
Rex Scare	2011			
Edward Tsui	2011			
Corresponding		Corresponding		VISITORS PRESENT
Robert Bean	2005	Roy Ahlgren	2009	Tom Davidson
Niels Bidstrup	2009	Raymond Albrecht	2002	Mehdi Shahrestani
Tom Cappellin	2010	Steve Anthony	2011	Eddie Huestis
William Coad	2007	Charles Arnold	2003	Hans Hansen
Kim Cross	2010	Gil Avery	2006	Chris Kerback
Hooman Daneshmand	2011	Peter Baade	2008	David Lee
Mark Hegberg	2011	Donald Bahnfleth	2006	Frank Rivera
Larry Konopacz	2008	William Bahnfleth	2007	Paul Sohler
Trace Laux	2010	David Bixby	1994	Justin Westmoreland
Frank Myers	2007	Albert Black	1987	Aykut Yilmaz
Thomas Neill	2011	Cyrus Blackmore	2007	
Michael O'Rourke	2011	Jeffrey Boldt	2010	
Drew Overmiller	2008	Thomas Butcher	2010	
Reddy Palicharla	2011	Michael Collarin	2010	
Donald Prather	2010	Kelly Cramm	2006	
Mick Schwedler	2011	Vikram Doshi	1996	
Kevin Stuart	2010	Scott Fisher	2011	
Bodh Subherwal	2010	Fredric Goldner	2009	
Greg Towsley	2009	Farhad Golestan	2010	
Robert Walker	2010	Wilbur Haag Jr.	1995	
		Richard Hegberg	2010	

		Martha Hewett	2009	
		Kevin Hoey	2003	
		Joseph Hoose	2005	
		Chris Jacques	2010	
		Miha Kavcic	2007	
		Jack Kersten	1996	
		Evans Lizardos	2010	
		Thomas Logan	1996	
		Kenneth Magsam	2010	
		Zoltan Magyar	2005	
		Terrence Moses	2001	
		Mark Mueller	1999	
		Marc Neufcourt	2009	
		Earl Rightmier	2005	
		James Rishel	1987	
		Brent Ross	2005	
		Aniruddh Roy	2009	
		James Schlachter	2008	
		William Schulte	2011	
		Alexander Sleiman	2006	
		Alpdeniz Soysal	2011	
		Harvey Stenger	2010	
		Joseph Thuman	2007	
		David Tree	1999	

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

TAC Section Head:	John Dunlap, PE
TAC Chair	Charles Culp, III
All Committee Liaisons as Shown on TC/TG/TRG Roster	ALI/PDC - John Nix, II
	Handbook Fundamentals – Forrest Yount
	Handbook Fundamentals – David Yuill, PE
	Research – Stephen Hancock
	Special Publications – William Fleming
	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
San Antonio, TX
June 26, 2012

1. Call to Order:

Chair Keen 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 (1 voting member arrived late), including 1 non-quorum voting member..

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. Request for change to the order of items f. and g. was requested by Greg Towsley. Member Bill Coad requested an additional item be added to the Agenda, which was agreed to by the Chair.

3. Approval of Chicago Meeting Minutes

Motion by John Glunt, seconded by Mike McDermott to approve the Chicago 2012 meeting minutes. Motion passed 6-0-0.

4. Section 6 Breakfast Report

Chair Keen summarized the key points of the Section 6 Breakfast. Key items included:

- (a) The roster of voting and corresponding members of TC 6.1 are available on the website through the member's link.
- (b) Requested that any changes to roster information be submitted to the Chair.
- (c) CEC is always looking for TC reviewers for papers. The Chair should be notified of a member's interest in volunteering.
- (d) A July e-mail will be issued to committee members with information on obtaining a 'member thank-you' letter from ASHRAE.
- (e) An ASHRAE Wiki is now available at www.wiki.ashrae.org which has a routinely updated terminology page.
- (f) The CEC has announced beginning at the Dallas Meeting the previously complementary registration fees for the meeting (e.g. –

speakers, monitors, etc.) will now be charged a registration fee of 25% (a 75% discount). Everyone will pay.

5. Sub-Committee Reports

- A. Programs: Mike McDermott (Chair). Subcommittee meeting minutes of June 25, 2012, are attached. A look ahead for the Dallas, Denver, and New York programs is also attached.

Chair McDermott reviewed the two programs sponsored by TC 6.1 at this meeting [Seminar 8 – Exploring Indoor Environmental Applications with Displacement Ventilation and Radiant Cooling and Heating Systems; and Forum 8 – If Hydronic HVAC Systems Are So Great, Why Doesn't Everyone Have One?].

Mark Hegberg suggested adding a session on core issues , such as a “Hydronics 101” seminar.

Ideas for future programs are always welcome to Mike McDermott.

- B. Research: Tom Cappellin (Chair). Subcommittee meeting minutes of June 25, 2012, attached. This includes updates from the Research Chairs Breakfast Meeting.

Chair Cappellin moved the committee to approve the RTAR submitted by Scott Fisher on Anchor Force Analysis Modeling. The motion was approved by a vote of 7-0-0.

A future conference call is planned to discuss TC 6.1's co-sponsorship with TC 1.4 of a research project regarding control valve selection for improved controllability.

- C. Handbook: Rex Scare (Chair). Subcommittee meeting minutes of June 24, 2012, attached.

Bill Coad and Al Black have updated Fundamentals Chapter 22 – Pipe Sizing. Chair Scare will put markups into .pdf and distribute to members for an e-mail vote within the next week. Liason David Yuill said the deadline for submitting the final copy is extended to July 11 (from June 28) to allow all time to review. An e-mail vote is scheduled by July 6.

Discussion continued on merging Fundamentals Chapter 22 – Pipe Sizing and Systems Chapter 46 – Pipe, Tubes, and Fittings into a single 'Hydronic System Pipe Design' Chapter in Fundamentals similar to the Duct Systems Chapter. Many comment pro and con. No decision was made on merging the two chapters.

Chair Keen suggested members offer suggestions as which topics in these chapters do not fit the stated goals of TC 6.1 and issue those back to the Handbook Committee for distribution to the appropriate TCs.

- D. Chilled Water Sub Committee : Steve Tredinnick (Chair). Chair Tredinnick was absent.

Chair Keen reported the Handbook Committee is reviewing the idea of a separate handbook chapter on Chilled Water Plant Design and will be communicating back to TC 6.1 their conclusions at the end of this week.

- E. Membership: John Glunt (Chair). Chair Glunt reports TC 6.1 has 76 total members (11 voting and 65 corresponding members). He suggested visitors attending the meeting interested in becoming a provisional member, the first step in the membership process for a TC, can provide him with a business card with their contact information (and, preferably their ASHRAE Membership Number).

Members can also indicate their interest through the ASHRAE website. Information on this is attached to these meeting notes.

- F. Professional Development (ALI). Greg Towsley (Chair): Chair Towsley reports:

- Courses for Dallas have been identified, including some new half-day courses
- New proposed courses: 50% AEDG (Small-to-Med. Office Bldgs), Energy Auditing/Energy Assessment, Std. 55, Std. 100
- SDL's in Progress
 - Water System Design (SDL 7) - IP version mostly complete; waiting on SI file and *.ppt file
 - Fundamentals of Heating Systems (SDL 12) - behind schedule; IP first draft expected by 07/01/12
 - Chilled Water Plants (not TC6.1 responsible) - behind schedule
 - Psychometrics (not TC6.1 responsible) - Need author/editor to revise materials
- SC's in progress that TC6.1 may want to be aware of:
 - Optimization of HVAC Systems
 - Advanced CHP
- Other new courses being considered
 - Documentation required to meet LEED related to 90.1, 62.1, 55, 189.1
 - SOW for a 3rd Dist. Heating. and Cooling course

- G. Standards: Mike O'Rourke (Chair).

Standard 55: Chair O'Rourke reported it is in continuous maintenance mode. The group is working to clean up the language to clarify the Air Speed Limits in regards to the recent rejections by LEED referencing this document.

Standard 155: Frank Myers reports the joint sponsorship agreement between AHRI and ASHRAE was signed at this meeting. The group is working towards a methodology for better tolerances as related to thermal efficiency testing. There's a general feeling of drawing towards a January release for public review of the standard.

Standard 208: Mark Hegburg reported the group met unofficially and is proceeding.

Standard 152: Robert Bean reports the method of testing detailed in this standard is almost unusable. The group may look to TC 6.1 for support.

Standard 90.1: Greg Towsley reports on recent activities from this group.

- Various
 - Piping insulation proposal is being worked on and considered. Insulate “everything” that has liquid in it, including pumps, excluding control valves; Exception for other equipment that is “rated”.
 - Lots of work related to data centers, heat pumps
 - Motor efficiency update - updating definitions in 10.4.1 and tables 10.8
 - Addendum am - Part-load boiler efficiency
 - 2 comments; one was rejected and okay with commenter; other is also rejected (related to turn down) and suggested that it will be reviewed for further improvement after 90.1-2013.
 - User manual feedback
 - Pump/equipment isolation revision in Hydronics Section
- Addendum ak
 - Presented comments to Addendum ak at the Atlanta meeting; 90.1 Mech. Sub Committee (MSC) reaffirmed proceeding with putting Add. ak for public comment.
 - Comments for Add. ak closed on Monday, June 25 (approximately 21 last count)
 - Since Atlanta, Jeff Boldt, 90.1 MSC member, put together a Hydronics Working Group to come up with new wording for the Hydronics section of 90.1
 - Nearly weekly phone meetings
 - Keen, Hegberg, Tredinnick, Morrison, Glunt, Towsley
 - Rewording presented to TC6.1 Voting Members:
 - Review the qty. of responses and type
 - Review the proposal and provide comments to Boldt before next MSC meeting
 - ak options

- review and reply to all public comments and proceed
- modify ak to incorporate 6.1 proposal for 2nd public review
- withdraw and work on new Addendum with reference to 6.1 proposal
- QUESTION: If 6.1 thinks that 90.1 hydronics section can be improved we should put together a subcommittee to develop something for 2016(?)
 - Question for TC: Based on the Scope of 6.1, what is 90.1 missing that we can add to improve 90.1 and their scope? (Forum?)

H. WEB Site: Jason Atkisson (Chair) Chair Atkisson stated the website has been updated with the new ASHRAE logo and meeting schedule. Links have been verified and are working. The member list will be updated following any changes at this meeting.

6. Liason Reports.

- A. Section Head (John Dunlap). Dunlap confirmed Chair Keen had reviewed the TC Breakfast and affirmed the on-going work of TC6.1.
- B. Research (Steven Hancock). No updates or information was needed.
- C. Handbook (David Yuill). Thanked TC 6.1 for the work on the large number of chapters the TC is responsible.

7. Liaison Reports from other TC's and Organizations.

- A. ACCA (Don Prather). Reported a Hydronics Council is meeting in Providence, RI, on September 11 and 12, 2012. The intent is to supplement, and not replace, the ASHRAE Guidelines.

8. Old Business:

No old business to conduct.

9. New Business:

- A. Chair Keen thanked the committee for their quick response to the various e-mails asking for comments over the past six months.
- B. Chair Keen has had conversations with the editor of the ASHRAE Journal. The Journal is looking for more 'basic' articles to run, perhaps in a series. A list was passed around with members writing topic suggestions for Fred Turner to review.
- C. Bill Coad discussed the suggestion of Robert Bean to initiate the Carlson/Holihan Industry Award of Excellence, to be awarded to an engineer exhibiting excellence in engineering and humanitarian efforts. Coad suggested TC 6.1 submit a request to the Honors and Awards Committee for approval. Tricia Bruenn made a motion that TC 6.1 should be responsible for submitting the required documentation to the Honors and Awards Committee for the establishment of this award, seconded by Mike McDermott. The motion was passed by a vote of 7-0-0. Chair Keen

- named an ad hoc committee to be chaired by John Glunt with members Mike McDermott, Edward Tsui and Bill Coad for this purpose.
- D. There has been a request for TC 6.1 to review Guideline 8 (Btu Meters). Mike O'Rourke and Mark Hegberg will review for the TC.
 - E. Greg Towsley reported on the status of a new pump efficiency standard for the United States. The goal is to produce a standard, similar to Europe's for pump efficiency for later this year with third party or self-certified testing.
 - F. Mike O'Rourke acknowledged Mike McDermott's help from TC 6.5, stating it was good for hydronics.

10. Meeting Adjournment:

The meeting was adjourned at 3:22pm.

Submitted by,
Bob Walker.
TC 6.1 Secretary



Standards, Research & Technology

Applying For Membership On A Technical Committee

ASHRAE welcomes new members to its technical committees.

To be considered for technical committee membership, you must:

- Notify ASHRAE staff at TCStaff@ashrae.net of your interest in a particular TC, TG, TRG, or MTG.
- ["Manage Your Membership" link from the ASHRAE Web site](#)

Please note:

If you do not have an ASHRAE ID, are or not applying for ASHRAE membership, and are applying for a position that requires an ASHRAE bio to be on file, please [click here](#) to request an ID and PIN. You may also use that link if you already have an ASHRAE ID as a non-member, but you do not have a record of what that number is.

You will immediately be assigned as a Provisional Corresponding Member. The acceptance of provisional corresponding membership implies participation in committee activities through correspondence or in-person involvement. Provisional corresponding members serve 2 year terms. Although provisional corresponding members are not voting members, at the end of your term and based on participation in the committee, you may be considered for future voting membership.

Notification of acceptance to a TC is emailed upon your appointment.

SAN ANTONIO MEETING MINUTES
PROGRAMS SUBCOMMITTEE
ASHRAE TC 6.1 “HYDRONICS AND STEAM HEATING EQUIPMENT AND SYSTEMS”

- A. Meeting called to order at 2:15 pm, 23 June 2012 at Grand Hyatt, by Mike McDermott
- B. Members and Visitors in attendance

Name	Position
Mike McDermott	Programs Subcommittee Chair
Julia Keen	Chair
Rex Scare	Member
Hans Brink Hanson	Member
Noels Bidstrup	Member
Scott Fisher	Corresponding Member
Bob Walker	Secretary
Rex Scare	Handbook Committee Chair
Tom Cappellin	Research Subcommittee Chair
Greg Towsley	ALI Coordinator
Jason Atkisson	Web Master
Edward Tsui	Member
Hooman Daneshmand	Corresponding Member
Larry Konopacz	Corresponding Member
Trace Laux	Corresponding Member
John Bade	Guest
Mehdi Shahrestani	Guest
Michelle Contri	Guest
Justin Westmoreland	Guest

- A. Current and future programs were discussed.
 - 1. We have two (2) programs that will be presented in San Antonio:
 - a. Exploring Indoor Environmental Applications with Displacement Ventilation and Radiant Heating and Cooling Systems
 - 1) Predicted Thermal Comfort and Ventilation Performance In Combined Floor and Displacement Systems – Michel Tardif, CanMETEnergy National Resources of Canada
 - 2) Room Air Stratification and Ventilation Performance In Combined Chilled Ceiling and Thermal Displacement Systems – Stefano Schiavon, U of Cal, Berkeley
 - 3) Applied Chilled Sails and Thermal Displacement Ventilation – Jerry Sipes, Price
 - 4) DV in Healthcare – Bob Gulick, Mazzetti and Partners
 - b. If Hydronic HVAC Systems Are So Great, Why Doesn't Everyone Have One - Paul Torcellini, National Renewable Energy Lab, Golden, CO

2. Feedback on completed programs
 - a. Celebrating High Temperature Cooling and Low Temperature Heating - Montreal
 - 1) 150 attendance
 - 2) "Probably the best seminar I attended at the conference, congrats to the organizer and the speakers"
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. See attached look ahead spread sheet for future programs.
5. For detailed information on how the above programs as to be assembled and submitted visit ASHRAE's web site for information and direction.

www.ashrae.org/dallas

- **Track 1: HVAC&R Systems & Equipment**

Track Chair: Yunho Hwang / Keith Newcomer

Email: yhhwang@umd.edu / keith.newcomer@piedmontng.com

An HVAC&R system is a combination of equipment engineered and duct and/or pipe distribution to operate in concert to provide the desired results for the space or process. Whether simple, standard, or unconventional – the equipment and system distribution must be designed, installed, operated, and maintained to achieve those results. The series of programs and papers in this track will highlight the basic to advanced options for the designers, contractors and operators to deliver effective, efficient, sustainable systems.

- **Track 2: HVAC Fundamentals and Applications**

Track Chair: Mike McDermott

Email: mxm@grummanbutkus.com

Fundamentals are the building blocks for understanding their applications. Thermodynamics, fluid flow and psychrometrics are key components to evaluating the basic to advanced applications. In addition, topics that cover the standard "value engineering" items like resized duct or pipe could be addressed. The intent of this track is to provide papers and programs that cover varying levels of fundamentals for the designer in a wide array of topics.

- **Track 3: Standards, Guidelines and Codes**

Track Chair: Jon J. Cohen

Email: jcohen@hohwatertechnology.com

ASHRAE is known for its standards – and they are constantly evolving with the intent on improving the built environment and its systems. Designers, Contractors and Owners must be able to keep up with the changes in the current cycle but to also be aware of what is to come existing and future standards. In addition, there is a large interaction of ASHRAE with the code authorities and government to incorporate these standards and guidelines. The series of sessions in this track will illustrate the changes to the standards and guidelines, their projected path and good design techniques to meet or exceed the standards.

- **Track 4: Energy Conservation**

Track Chair: Charles E. Henck

Email: chenck@wrallp.com

Whether it is new construction, renovation, routine maintenance or energy audits there is a major concern over the use of energy in the built environment. Designs are using more techniques to reduce energy with the use of energy wheels and pipes, solar energy, photo voltaic, and more efficient equipment and new concepts that are pushing to be standard design practice. In addition, modeling is being used to generate more life cycle cost decisions for the design and value-engineering decisions beyond standard HVAC practice. This track will highlight case studies and research that expand on the simple to the complex energy savings measures being implemented in today's and tomorrow's designs.

- **Track 5: Refrigeration**

Track Chair: Robert B. Risley

Email: rrisley@fpl.com

The refrigeration cycle is found in almost every component in our lives; personal comfort, food and beverage, medicinal needs, transport, and many other processes. This track will draw upon technical papers, practical solutions, and new opportunities that will cover a broad range of refrigeration applications as well as refrigerants.

- **Track 6: Large Building Design**

Track Chair: Dennis Wessel

Email: dwessel@karpinskieng.com

Is everything really bigger in Texas? Many buildings are larger than average in square footage; large assembly, healthcare, and industrial facilities. Many are taller in terms of office, hotel and multi-family. However, there are large buildings almost everywhere, not just Texas. This track will draw upon "larger than life" case studies, as well as large building HVAC systems that can be classified as "innovative and/or 21st century" that highlight the opportunities presented and achieved by the designer, builder, and operator for facility HVAC systems throughout the world.

- **Track 7: Facility Management; Operations, Technology and Energy Improvements**

Track Chair: Bill Dean

Email: Bill.Dean@nrc-cnrc.gc.ca

The Facility Management Team has to determine and then strategically manage their operating budget for operating, maintenance and capital expenditure – in ways that will provide the best return on their investment in today's sustainability drive and in sync with the organization or institution's master plans and/or business plans. In today's economic environment, those dollars and decisions are only being scrutinized more than ever. This track will seek papers and programs that cover energy conservation measure case studies, new and revived management tools addressing BIM as a management tool, increased technologies for automation systems, and overall facility management with an eye towards overall financial management and sustainable building services.

- **Track 8: Industrial & Transportation Ventilation**

Track Chair: Sarah E. Maston

Email: sarah@abpcx.com

Often considered boutique engineering, both industrial and transportation design, construction, operation, and maintenance needs to be elevated to equal status with other HVAC applications. These systems require the same design approach as other system designed but usually have special technical requirements that mandate close velocity capture/control, air quality control, etc. that can be overlooked but the more traditional building system design engineer. This track will seek case studies and trouble-shooting projects highlighting the opportunities and pitfalls associated with these unique applications.

Conference Program Chair: Wade Conlan

Email: wade.conlan@exp.com

Staff Support

For information on the technical program, special events, special sessions and general conference inquiries

Tiffany D. Cox

Conference Program Administrator

Email: tc Cox@ashrae.org

Technical Support

For technical problems or for help in submitting an abstract online, [email Tech Support](#)

June 1	Web Site Opens for Seminar and Forum Proposals
July 9	Final Conference Papers Submitted for Review
Aug. 13	Seminar and Forum Program Proposals Due
Sept. 14	Conference Papers Accept/Reject Notifications and Notifications of Seminar and Forum Accept/Reject Distributed
Dec. 7	Upload of PPTs Begin
January 7, 2013	All PPTs Due Online
Jan. 26	Speaker's Lounge Opens

Submission Instructions

To begin, please choose the program type that you would like to submit a program proposal to.

[Begin a Forum Submission](#)

(1 moderator - 60 min, no presentations)

[Begin a Seminar Submission](#)

(1-2 presentations - 60 minutes in length; 3-4 presentations - 90 minutes in length)

Before beginning your submission, it may be a good idea to gather all the information that you will be required to submit.

There are five steps to the submission process:

1. **Session Description:** Enter the title of the session. Also please provide a 100 word abstract. Please complete the rest of information, including TC sponsors (if any), estimate of the size of audience, etc.
2. **People:** Provide your name and contact information as the session organizer. Enter presenters by choosing the "Presenter" checkbox. You will need to enter the presentation title as well. Once a presenter has been entered, you will see the presentation title and presenter's name listed on the "People" step. Click on the icon in the Abstract text column to enter the abstract. Click on the author's name to add co-presenters and speaker bios.
3. **Objectives:** Please include six Learning Objectives for the entire session. The Learning Objectives should complete the statement, "After attending this session, the attendees will be able to..." All six Learning Objectives need to be addressed by the speakers. The Learning Objectives should use measurable verbs such as "Explain," "Describe," "Distinguish," "Design," "Apply," etc., such as the example below:
 1. Define Smart Grid functions, objectives and architecture
 2. Describe how the Smart Grid affects building operations
 3. Provide an overview of Smart Grid projects in North America
 4. Describe the federal policies and regulations promoting the Smart Grid
 5. Explain how building operators can obtain access to their energy use and usage profile information

6. Describe how to use electricity use/profile information to reduce energy costs through features such as alerts, billing histories, graphs, usage histories for budgeting
4. **Method of Assessment:** Please include 10 questions and answers for the entire session based on the Learning Objectives and what will be covered within the speakers' presentations.
5. **Confirmation:** When you are happy with your submission, click the "Conclude Submission" button. Note that you will still be able to make changes to your abstract up until the submission deadline.

B. Adjournment of subcommittee at 4:15 pm

TC -6.1 Programs Look Ahead - San Antonio 2012 Meeting

Year	2013	2013	2014
Date	Jan 26-30	June 22-28	Jan 18-22
City	Dallas	Denver	New York
Tracks	www.ashrae.org/dallas/	www.ashare.org/denver/	www.ashare.org/newyork/
1	HVAC & R Systems and Equipment	HVAC & R Systems and Equipment	HVAC & R Systems and Equipment
2	HVAC & R Fundamentals and Applications	HVAC & R Fundamentals and Applications	HVAC & R Fundamentals and Applications
3	Standards, Guidelines and Codes		
4	Energy Conservation	Energy Conservation	Energy Conservation
5	Refrigeration	Refrigeration	Refrigeration
6	Large Building Design		
7	Facility Management: Ops, Tech and Energy Improv		
8	Special Interest Track		
Technical Paper	Paper: April 16, 2012	Paper: September 17, 2012	Paper: April 18, 2013
	Bypass Orifice Testing - U of K - Greg		
Conference Paper	Abstract: March 19, 2012; Paper: July 9, 2012	Abstract: September 9, 2011; Paper: Jan. 9, 2012 (Tentative)	Abstract: March 19, 2013; Paper: July 9, 2013
		Pump Analysis Student Paper - Egils Dzelzitis (Latvia)	Study of Hydronic System Optimization - Mehdi Sharestani
		Boiler, Valve and Pump Selection - Trica	
Seminar	Proposal: August 13, 2012	Proposal: February 11, 2013	Proposal: August 13, 2013
	Pressure Independent Control Valve Fundamentals and Applications - Tricia Bruenn/David Kandel/Ken Luther/Hooman Daneshmand	ASHRAE Stsd 155P Rating Htg Boiler Systems- David Bixby/Aykut Yilmaz	Steam Sytesm Design Fundamentals - Rex Scare
	Small Variable Primary CHW Systems - You Find the Errors -Jason/Mick Schwedler	Chilled Beam Hydronic Fundamentals and Applications - Mike McDermott/Robert Bean TC-6.5	Steam Systesm Design Applications - Jason Atkission (TC-7.7)
	Building Accessments of Hydronic Systems- Greg Towsely		Chiller Plant Contol Fundamentals and Optimization - Ed Tsui
	Hydronics 101 - Mark Hegberg	Air Separation Fundamentals and Applications - Leo Rocha	How ASHRAE Std 90 can affect Hydronic Design - Jason Atkisson
	Pump Fundamentals and Applications - Neils Bidstrup/Larry Konopacz	Integration of Thermal Storage Hydronic Systems - Hans Hanson (TC-6.9 and TC-1.4)	
	Data Center Hydronic Fundamentals and Applications - Hooman Daneshmand (TC-9.9)		
Forum	Proposal: August 13, 2012	Proposal: February 11, 2013	Proposal: August 13, 2013
		Chiller Plant Contol Fundamentals and Optimization - Ed Tsui	Are Steam Heating Systems Prhistoric or Sustainable? Trace Laux

RESEARCH SUBCOMMITTEE REPORT
ASHRAE TC 6.1 "Hydronic & Steam Heating Equipment & Systems"
ASHRAE ANNUAL CONFERENCE – San Antonio, TX
Monday, June 25, 2012
Thomas E. Cappellin – Chair

Notes From Research Subcommittee Chair's Breakfast:

1. Current & Future Projects:
 - a. 19 New Projects have been awarded.
 - b. 28 Projects were completed.
 - c. There are currently 62 active projects of which 11 are in a closing phase.
 - d. There are 6 conditionally approved Tentative Research Proposals (TRP) possibly ready for bid this fall.
 - e. If the Research Administration Committee (RAC) also wants to fund a significant number of approved Unsolicited Research Proposals (URP); it needs to prioritize them accordingly.
2. ASHRAE Service to Research Award:
 - a. Purpose:
 - i. Recognize individual for excellence in volunteer service to Society research.
 - b. Eligibility:
 - c. ASHRAE members who have demonstrated exceptional research service (planning, proposal evaluation, project monitoring, and/or utilization of project results).
 - i. Not open to current TC chairs or RAC/TAC members.
 - ii. Nomination by Technical Committee/Task Group (TC/TG) chair of a voting or corresponding member by September 30, 2012.
3. Grants-In-Aid:
 - a. A letter announcing the availability of ASHRAE Grants-in-Aid for Graduate students will be sent to over 300 colleges in October, 2012.
 - b. In 2011-2012 there were 65 applicants for a grant. The applications will be evaluated by RAC during ASHRAE's next winter meeting.
4. Innovative Research Grants (IRG):
 - a. This spring five proposals have been reviewed.
 - b. Unfortunately all proposals were declined for any of the following reasons:
 - i. Not considered to be innovative.
 - ii. Not new work but just a contribution to on-going projects.
 - iii. Too much product development oriented.
 - iv. Limited value for the ASHRAE community.
 - c. RAC is reviewing the current IRG procedure and will publish a renewed call and guidance by November, 2012.
 - d. Proposals will be reviewed during the winter meeting:
 - i. They should be "out of the box" proposals for new research.
 - ii. No direct connection to current activities of TC's is expected.
 - iii. Expected value for the ASHRAE community is paramount.
 - iv. No product development will be considered.

5. Work Statements (WS):

- a. RAC reviewed four work statements; 3 were conditionally accepted; one was returned with comments.
- b. The conditionally accepted work statements will be released for bid once the responsible Research Liaison is satisfied that all approval conditions have been satisfied by the TC/TG or Standing Standard Project Committee (SSPC) and after funding becomes available.

6. Research Topic Acceptance Reports (RTAR):

- a. RAC reviewed five RTARs for addition to the Society's Research Implementation Plan (RIP):
 - i. Three were conditionally accepted.
 - ii. One was returned.
 - iii. One was rejected.
- b. All RTARs that were reviewed will be returned to the sponsoring committee with specific feedback comments from RAC.

7. TC's are encouraged to produce more projects:

- a. It takes between 1-2 years before a WS is accepted and a TRP is ready for bidding.
- b. If RAC doesn't receive enough proposals during 2012/2013 it may run out of projects.

8. Denver Program:

- a. Contributions on research will be given special attention.
- b. The first annual "Research Mini-Conference" will be held at the Denver Conference. Papers and seminars on on-going or recently completed research are being solicited.
- c. A special new program track has been developed to expose ASHRAE research activities.
- d. Technical Papers, Conference Papers, Seminars, and Forums related to research plans, on-going research, or their results will be given a preference.
- e. TC's are encouraged to use this opportunity to make research activities more visible.

9. ASHRAE Seeks Papers for Research Programs for the 2013 Annual Conference in Denver:

- a. ASHRAE has announced a call for papers for a Research Summit held in conjunction with the Society's 2013 Annual Conference in Denver, Colorado – June 22-28.
- b. RAC's help has been requested to present papers on ASHRAE-related research. The Society currently has 70 projects worth \$14 million in process, and seeks to transfer this information to the research community through papers.
- c. The research-related papers are a part of the overall Research Mini-Conference encompassing keynote speakers, forums, panel discussions, and seminars. The purpose of the summit is to bring together researchers to present and discuss the latest research.
- d. Additionally, papers are sought that:
 - i. Describe completed and work-in-progress research.
 - ii. Address broad areas, such as innovations in HVAC&R research and holistic building science.
 - iii. Describe Renewable Energy research and its role in the industry's movement toward a clean energy economy.

- iv. Present research from societies and associations worldwide.
- b. ASHRAE offers two types of paper submissions, both due by September 24, 2012.
 - i. Conference Paper Abstracts. Upon acceptance, papers will be due January 14, 2013. These “final” papers undergo a single-blind review, are submitted as a PDF and have an 8-page single-spaced page maximum length.
 - ii. Full Technical Papers (no abstract submittal first). Papers submitted for review must be both technically accurate and clearly written. These papers undergo a rigorous double-blind review and can be a maximum of 30 double-spaced pages. Accepted technical papers are published in ASHRAE Transactions. Authors of papers published in Transactions may be invited to submit expanded papers for publication consideration in HVAC&R Research, ASHRAE’s Journal for archival research. ASHRAE Transactions papers are cited in the “Thomson Reuters Web of Knowledge Index of Scientific & Technical Proceedings, Index to Scientific Books and Current Contents Proceedings: Engineering Technology, Applied Physics”. ASHRAE Transactions papers are also cited in SciVerse Scopus and COMPENDEX.
- c. To submit a Research Conference Paper abstract or a Technical Paper, and for more information about the 2013 ASHRAE Annual Conference, go to www.ashrae.org/Denver, or contact the Technical Chair for the 2013 Annual Conference, Sarah Maston at sarah@abpcx.com.

10. Changes to Research Manual 2012:

- a. Section 3.2 – RTAR Submission and Approval Process – Updated and harmonized manual text with new RTAR review form used by RAC.
- b. Section 3.3 – RTAR Form – Updated descriptive text under form headings to better describe what information RAC seeks from TC’s under these headings.
- c. Section 6.2 – Project Analysis Sheet – Updated Criteria A & B review criteria on form.
- d. Section 7.1 – Unsolicited Research Proposals – Added text for handling URP’s that are a follow-up project to a previous ASHRAE research project. Also updated the suggested review criteria for URPs.
- e. Some new Section 3.2 requirement changes:
 - i. Provide realistic estimated project costs and duration.
 - ii. RTAR should indicate if the project is primarily a paper study or whether it involves computer simulations, laboratory testing, and/or field measurements.
 - iii. For simulations, laboratory, or field testing describe the size of the anticipated test matrix.

11. Why do RTAR’s get returned?

- a. Most common reasons:
 - i. Idea not appropriate for ASHRAE funding.
 - ii. Not adequate references to past work or existing literature.
 - iii. Not clear how project will “advance” the state-of-the-art.
 - iv. Budget does not seem in line with work to be completed; provide realistic and justified cost estimations.
- b. It’s about communicating your idea clearly.

12. New RTAR Coversheet:

- a. Be aware to use this new coversheet.
- b. Improved layout and easy-to-fill-in fields in the Word template.
- c. The Questions:
 - i. Has an electronic copy been furnished to the Manager of Research and Technical Services (MORTS)?
 - ii. Has the Research Liaison (RL) reviewed the RTAR?
- d. Also, it is beneficial to consult your RL before sending in the RTAR.

13. Use Your Research Liaison:

- a. Your RL should read your RTARs and WSs before you submit them.
 - i. Give the RL more than a couple of days before the deadline for submission.
- b. Your RL has the Answers and can help you interpret RAC comments and the Research Manual.
- c. Your RL is your champion:
 - i. Your RL will advocate for you if he/she is involved in the preparation process of RTARs or WSs.

14. Ask Your Research Liaison:

- a. The best advocate you have is your RL.
- b. Involve the RL from start to submission of RTARs or WSs.
- c. This is a more secure, faster way to your success.
- d. RAC is aware that it is not easy to find your RL in person during the meeting. But sending the RL an E-mail is very easy. You don't need to know his name; just for Section x: RLx@ashrae.net.
- e. Inform your RL about your drafts and questions before our meetings. This makes it possible to consider the RL feedback in your TC.

15. Research Liaison Names for each Section:

- 1 – Arthur Giesler
- 2 – David John
- 3 – Mark Spatz
- 4 – Srinivas Garimella
- 5 – Piotr Domanski
- 6 – Stephen Hancock
- 7 – Phillip Haves
- 8 – David Yashar
- 9 – Carl Huber
- 10 – Pradeep Kumer Bansai

16. Dates and Reminders:

- a. RAC reviews RTARs and WSs at every meeting.
 - i. RAC meets during Summer Meeting, Winter Meeting, and Technology Weekend (October, sometimes March).
- b. RTARs and WSs are due May 15, August 15, and December 15.
- c. Conditionally approved WSs are due to MORTS by September 15 to go out for bid in October.
- d. Nominations for Service to ASHRAE Research Award are due September 30.

Notes From Research Subcommittee Meeting:

1. Scott Fisher RTAR:

Scott has finalized a draft version of his RTAR titled "Comparison of Computational Methods of Flexibility Analysis to Computer Modeling to Determine Thermally Developed L-Bend and U-Bend Anchor Forces."

The results will be used to update the anchor force equations presently provided in the 2012 version of Systems Handbook Chapter 45.

A subcommittee motion to accept this RTAR was made and seconded. The motion received a unanimous vote for submission to the full TC 6.1 Committee.

2. Mark Hegberg RTAR's:

Mark has two possible RTAR's that have been in limbo. He is still interested in updating them and placing them into full draft versions that comply with the latest requirements of RAC. These RTAR's may be ready for committee review at ASHRAE's winter meeting in Dallas.

3. TC 1.4 "Control Theory & Application":

Steve Taylor (Member of TC 1.4) has approached TC 6.1 with a request that TC 6.1 co-sponsor an RTAR titled "Control Valve Selection for Improved Controllability." This is a second-effort by TC 1.4 to submit this RTAR to RAC. TC 1.4

TC 1.4's purpose of the RTAR is to provide design techniques for control valve selection with the purpose of optimizing Hydronic system controls that result in more effective HVAC system operation. The results of the project are planned by TC 1.4 to be incorporated into the Fundamentals Handbook Chapter 15 "Fundamentals of Control," Application Handbook Chapter 45 "Design and Application of Controls," and a special publication on control valve selection. TC 1.4 believes that this information will possibly be picked up by control valve manufacturers for inclusion in their valve selection literature.

TC 6.1 has not supported this RTAR in the past due to conflict with the ability to realistically define and calculate how to achieve accurate "Authority" values that are repeatable and dependable. It is proposed by some TC 6.1 members that both committees work together as a "project sub-group" to arrive at a consensus that could revise this RTAR to the satisfaction of both committees.

This issue will be submitted to the voting members of TC 6.1, via telephonic or E-mail ballot/vote, by Research Subcommittee Chair Tom Cappellin to determine the course of action TC 6.1 should choose – whether to co-sponsor TC 1.4's RTAR or decline.

4. TC 5.3 "Room Air Distribution" has approached TC 6.1 with a request that TC 6.1 co-sponsor an RTAR that addresses best controllability of Fan-Coil Unit coil control valves– modulating or on-off action and how to accurately document coil/control valve fluid pressure drops that can be field measured and verified.

Research Subcommittee Chair Tom Cappellin will contact TC 5.3 to request an Executive Summary of the proposed RTAR for review of TC 6.1's voting members.

5. Proposed TC 6.1 RTAR "Steam System versus Heating Hot Water System Efficiency Comparison." This proposed RTAR needs an Author.

An attendee of the Research Subcommittee – Justin Westmoreland – provided the following comments:

"Steam vs. Hydronic Heating Energy Consumption and CO2 Production: If you were to not just look at site energy, but the power plant energy level, what would the answer be? Hydronic heating systems typically are more efficient but there is also added pumping required which increases the electric load. The consideration of the type of power generation would need to be considered. The intent would be to develop factors for the carbon foot print and energy trade-off depending on the emissions and efficiency of your local plant and type of power source. This could be helpful with new "Green" design standards and federal MACT requirements."

6. Proposed TC 6.1 RTAR "Tool for Simulation of a Dynamic Hydronic System." This was proposed by an attendee of the Research Subcommittee – Mehdi Shahrestani.

Mehdi will submit an abstract that proposes how the "Tool" could benefit this type of simulation and possibly interact with other Hydronic simulation tools.

Mark Hegberg asked that Mehdi include descriptive narration about his process and methods that could be included in the research project.

Motion to adjourn the TC 6.1 Research Subcommittee meeting was tendered by Rex Scare and Seconded by Jason Ackisson. Motion to adjourn was unanimously accepted.

END OF REPORT

Attachment: Attendance Sign-in sheets – two pages.

ATTENDANCE LIST

ASHRAE TC 6.1 HYDRONIC & STEAM HEATING EQUIPMENT & SYSTEMS - "RESEARCH" SUBCOMMITTEE

3:15 - 4:15pm - June 25, 2012 - CC 103-B - (5)

Name	Company and Address	Committee Position	Preferred Phone or E-mail Address
Thomas E. Cappellin	E.L. Pruitt Company Inc. 3090 Colt Road Springfield, IL 62708	Subcommittee Chair	tcappellin@msn.com
TRACE LAUX	NIBCO 3819 Shiloh Acres Trail Wildwood, Mo 63069		
JULIA KEEN	Kansas State University ARE/CNS 240 Seaton Hall Manhattan KS 66506	Chair, TC6.1	jkeen@ksu.edu
Rex Scare	Armstrong International 816 Maple St Three Rivers, MI 49093	TC 6.1 Handbook Chair	Rexs@ armstronginternational.com
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Mehdi shahrestani	university of Reading Reading, UK school of construction management and Engineering		m.shahrestani@pgr.reading.ac.uk

ATTENDANCE LIST

ASHRAE TC 6.1 HYDRONIC & STEAM HEATING EQUIPMENT & SYSTEMS - "RESEARCH" SUBCOMMITTEE

3:15 - 4:15pm - June 25, 2012 - CC 103-B - (5)

Name	Company and Address	Committee Position	Preferred Phone or E-mail Address
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Mike McDermott	GRUMMAN BUTKUS	Program Chair	m.mcdermott@grummanbutkus.com
Jason Ackisson	ROSS : BARUZZI	Webmaster	jackisson@rossbar.com

TC6.1 Handbook Subcommittee Meeting Minutes 6/24/2012

Attendees:

Rex Scare
Julia Keen
Tricia Bruenn
Larry Konopacz
Niels Bidstrup
Edward Tsui
Bob Walker
Hans Hansen
Jason Atkisson
Mick Schwedler
Trace Laux
Mike McDermott
Drew Overmiller
Ivan Thomas

- Chicago minutes approved – Motion by Julia Keen, 2nd by Tricia Bruenn....motion carried.
- Cindy Calloway from Handbook Committee shared concern of whether the proposed Chiller Design chapter belongs in the handbook or separate book.
- Cindy also mentioned that ASHRAE is discussing the online version of handbook. Topics in discussion are (1) Online + to be part of Online at no extra charge and (2) Online version of Handbook to be one of member benefits.
- The combining of Chapter 46(Pipes) of Systems with Chapter 22(Pipe Sizing) of Fundamentals did not happen. Those that were combining did not feel it was a good idea.
- Chapter 22 of Fundamentals will be approved with no revisions for the 2013 Fundamentals.
- Decided to remove Chapter 46(Pipes) from Systems Handbook and put the information in other applicable chapters. Most information will go into Chapter 22 of Fundamentals, but some will go in other chapters.
- Chapter 22 of Fundamentals also needs to have a portion of its contents removed and placed into other applicable chapters.
- Mike McDermott is taking the lead on the above (2) points. Julia Keen, Jason Atkisson, and Edward Tsui will also work with Mike on the above.
- It was decided to make Chapter 22 similar in format to the chapter on ducts.
- Trace Laux is going to update Chapter 47 - Valves with the revisions from a hard copy that Tricia has. These were the revisions from the 2008 update that did not get added as ASHRAE did not receive the requested revisions.
- All future handbook revisions should include the following:
 - At least one practical design example
 - Sustainability example and/or calculation
 - Ask international members for input from their perspective.
- Meeting adjourned at 6:20 pm