

**AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING  
ENGINEERS, INC.  
1791 Tullie Circle, N.E./Atlanta, GA 30329  
404-636-8400**

**TC/TG/MTG/TRG MINUTES COVER SHEET**

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

TC/TG/MTG/TRG No. 6.1 DATE February 9, 2015

TC/TG/MTG/TRG TITLE Hydronic and Steam Equipment and Systems  
DATE OF MEETING January 27, 2015 LOCATION Chicago, IL

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS AND ADDITIONAL ATTENDANCE
Jason Atkisson	2011	Ramez Afify	2011	
Michael McDermott	2011	Tricia Bruenn	2009	
Thomas Neill	2011	Frank Myers	2013	
Don Prather	2013	Greg Towsley	2013	
Rex Scare	2011			
Edward Tsui (non-quorum)	2011			

**DISTRIBUTION**

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

TAC Section Head:	Mark C. Hegberg
TAC Chair:	Dr. Eric W. Adams
All Committee Liaisons As Shown On TC/TG/MTG/TRG Rosters:	ALI/PDC – Darin W. Nutter Chapter Tech. Transfer – Maggie Moninski Research - Stephen S. Hancock Special Pubs - Standard – Cyrus H. Nasser 2016 HB Systems - Forrest S. Yount 2017 HB Fundamentals – Van D. Baxter
Manager Of Standards Manager Of Research & Technical Services	Stephanie Reiniche Mike Vaughn

**1. Call to Order:**

Vice Chair Scare called the meeting to order at 1:05pm. The Vice Chair explained Chair Bruenn was not in attendance and was hopeful she would return in Atlanta. Vice Chair Scare welcomed all in attendance and self-introductions were made. An attendance sheet was passed and signed by those in attendance. A roll call of voting members was conducted and a quorum was not present with only 4 of

10 voting members at the start of the meeting. At 1:11pm the TC achieved quorum with 2 additional voting members (1 non-quorum voting member, included) arriving.

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.

**3. Approval of Seattle Meeting Minutes:**

Motion by Thomas Neill, second by Don Prather to approve the past meeting minutes. Motion passed 5-0-1 (with the Vice Chair abstaining).

**4. Recognition of Liaisons:**

Mark Hegberg, TAC Section Head, thanked those in attendance for their participation and service to ASHRAE.

No other liaisons were present.

**5. Chair's Report**

Vice Chair Scare summarized the key items from the Section 6 Breakfast.

- (a) The 2014-15 Hightower Award Recipient is John Carter of TC 4.3
- (b) The 2014-15 Service to ASHRAE Research Award Recipient is Iain Walker of TC 4.3
- (c) TAC has developed a new award for the Outstanding Technical Committee Award.
- (d) The Electronic and Physical (E&P) meetings is in Beta but is now available for the TCs to utilize for TC members to participate from remote locations.
- (e) The CEC is seeking track suggestions for the 2016 Annual Meeting in St. Louis and other program information. Suggestions should go to Tony Giometti ([Giometti@ashrae.org](mailto:Giometti@ashrae.org)) of the ASHRAE Staff.
- (f) A new TAC Presentation template is available on the Technical Committee page of the ASHRAE website for TC members to use in presentations to their local chapters.
- (g) The Professional Development Committee (PDC) is seeking ideas for new ASHRAE Learning Institute (ALI) courses. The objective of the ALI is to provide quality, authoritative and practical technical information of broad interest.
- (h) There is a new Society service to allow TC Subcommittees to hold meetings via conference calls and web meetings.
- (i) TAC is asking ALL TC members to self-declare their employment discipline prior to the start of the new Society year on July 1, 2015 by going to the Members Only section and updating their bios.

## 6. Sub-Committee Reports

- A. Programs: Mike McDermott (Chair). Subcommittee meeting minutes of January 26, 2015, are attached. Spreadsheets with a look ahead to proposed programs in Atlanta, Orlando and St. Louis are also attached.

The TC sponsored at this meeting Seminar 25 Hydronics 101: Design Basics for Young Engineers and Complying with Standard 90.1. There were over 200 in attendance.

Chair McDermott led a discussion of potential topics for future programs.

- B. Research: Tom Cappellin (Chair). Subcommittee meeting minutes of January 26, 2015, are attached.

There was discussion regarding the need for the RTAR regarding flow verification of pressure independent control valves. The subcommittee will review.

- C. Handbook: Jason Atkisson (Chair). Subcommittee meeting minutes of January 25, 2015, are attached.

Chapter 15 will no longer be updated. TC 6.2 will become the cognizant TC for Chapter 15 after this cycle. Motion by Thomas Neill, second by Don Prather to approve. Scott Fisher noted Don Bahnfleth did extensive revisions to Chapter 15. Motion passed 5-0-1 (with the Vice Chair abstaining).

Motion by Rex Scare, second by Edward Tsui for the Committee to accept Chapter 28. Motion passed 5-0-1 (with the Vice Chair abstaining).

Motion by Thomas Neill, second by Rex Scare for the Committee to accept Chapter 46 with no edits. The chapter will cease to exist after 2016. Motion passed 5-0-1 (with the Vice Chair abstaining).

Scott Fisher reviewed the approximate correction factor for determining the output of a typical unit for the effects of altitude for different minerals. The equation in Chapter 36 differs from the AHRI equation for the same calculation. It was agreed the equation would remain as is in Chapter 36.

- D. Chilled Water Sub Committee: Steve Tredinnick (Chair). The Sub-committee met on Sunday January 25th with 15 attendees where the current status of the chapter was discussed.

First was a quick review of the work previously done. At the June 2014 Summer Annual Meeting in Denver, we suggested the selection of a cooling load profile (hospital in Miami, FL) for use in analysis in examples within the Chapter.

Volunteer authors were solicited and topics were assigned to the current Chapter Outline (attached to these minutes).

Different software platforms were discussed for editing the chapter simultaneously. Google Docs did not seem to meet those expectations, however, we had a test drive of Microsoft OneDrive and that allowed several authors to edit simultaneously and see the other's edits. This is an open platform that uses the Word Tracked changes that all should be able to use.

Tuesdays and Thursdays seemed to work best for all polled so far for meeting days, but a Doodle Poll will be issued shortly establishing regular meetings every 2 to 4 weeks to update progress and discuss issues.

Chair Tredinnick will not be able to attend the 2015 ASHRAE Summer Annual Meeting in Atlanta due to a conflict with the International District Energy Association Summer Meeting.

- E. Membership: Larry Konopacz (Chair). Chair Konopacz reported he is in the process of contacting all corresponding members to gauge their interest in remaining on the Committee Roster. Chair Konopacz reminded all to update their member profiles, especially their e-mail addresses.

- F. Standards: Mike O'Rourke (Chair). Chair O'Rourke was not in attendance.

Vice Chair Scare stated the Committee is looking to replace Greg Towsley as our committee liaison to 90.1. Mr. Towsley is no longer able to attend the 90.1 meeting. Chair Scare thanked Mr. Towsley for his past excellent service in this role.

Jason Atkisson reported he has dropped off the 90.1 working group.

Steve Tredinnick stated he has requested a sizing exemption for piping for district energy systems. He has not received an official response, yet, but feels it will not be accepted.

- G. Professional Development (ALI). Vice Chair Scare stated the committee is looking for a new ALI liaison.

Mark Hegberg reported SDL 7 (Water System Design) is in the final editing stages.

Mark Hegberg is working with Bill Pascal on SDL12 (Heating Manual). Mr. Hegberg stated this should be completed by the end of this fiscal year.

- H. Web: David Lee (Chair). Chair Lee stated the website is up to date. Scott Fisher remarked how informative our website is versus other TCs and thanked Chair Lee for his work.

Vice Chair Scare stated in the future, due to the file size, members would be e-mailed a link to view future meeting notes on line.

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

Don Prather reported the ACCA Radiant and Hydronics Council is meeting in Grapevine, TX, on March 16 from 8-9:30 AM. All are invited. More information can be obtained from Mr. Prather (donald.prather@acca.org)

**8. Old Business:**

- (a) Due to the absence of Ken Luther, no update was provided regarding the IAPMO proposal to make major revisions to the hydronic requirements in the UMC (Uniform Mechanical Code).
- (b) Motion by Jason Atkisson, second by Don Prather to reaffirm Standard 125. Motion passed 5-0-1 (with the Vice Chair abstaining).
- (c) Don Prather reported he had heard nothing regarding the proposed MTG of TC 7.3 to address the operations and maintenance activities that impact energy efficiency. Mr. Prather is still willing to participate and will report back on any activity of this MTG.

**9. New Business:**

- (a) Mike McDermott presented a tribute to Bill Coad, past ASHRAE President and member of TC 6.1. Other attendees added their remembrances of Bill Coad, also.

**10. Meeting Adjournment:**

Motion by Jason Atkisson, second by Thomas Neill to adjourn the meeting. Meeting adjourned at 3:04pm.

Submitted by,  
Bob Walker.  
TC 6.1 Secretary

## TC Sign-in Sheet

Meeting Info: JC 6.1 Date: 1/27/15

[illegible]



Meeting Info:

TC 6.1

Date:

1/27/15

[illegible]

**CHICAGO MEETING MINUTES**  
**PROGRAMS SUBCOMMITTEE**  
**ASHRAE TC 6.1 “HYDRONICS AND STEAM HEATING EQUIPMENT AND SYSTEMS”**

Meeting was called to order at 2:15 pm, June 30, 2015 at THE Palmer House by Mike McDermott

A. Members and Visitors projected attendance

Name - Position

**Mike McDermott – Prog Chair**

**Rex Scare – Chair**

**Scott Fisher – CM**

**Bob Walker - Secretary**

**Niels Bidstrup – CM**

**Jason Atkisson – Handbook**

**Gang Wang Guest**

**Bryson Borzoni - Guest**

**David Lee - CM**

**Tom Cappellin – CM**

Larry Konopacz – CM

B. Current and future programs will be discussed.

1. We had one programs in Chicago: Seminar 25 – Hydronics 101 Design Basics for Young Engineers and Complying with ASHRAE Std 90 – 200+ attendees, Jason Atkisson, Julia Keen and Jeff Boldt
2. Feedback from CEC on rejected programs – Lower Rank.
3. See attachment 1 look ahead spread sheet for future programs.
4. For detailed information on how the above programs as to be assembled and submitted visit ASHRAE's web site for information and direction.

C. Adjournment of subcommittee at 4:15 pm.

## Atlanta 2015

January 5, 2015	Website Opens for Seminar, Forum and Workshop Proposals
January 5, 2015	Final Conference Papers Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment)
January 30, 2015	Conference Paper accept/reject notifications
February 9, 2015	Seminar, Forum and Workshop Proposals Due
February 13, 2015	Revised Conference Papers/Final Technical Papers Due
February 27, 2015	Conference and Technical Paper Final Accept/Reject Notifications
March 23, 2015	Seminar, Forum, Workshop Accept/Reject Notifications
May 04, 2015	Upload of PPTs Begin
June 05, 2015	All PPTs Due Online
June 17, 2015	Final Day for Commercialism Revision Upload prior to on-site
June 27, 2015	Speaker's Lounge Opens

ATLANTA — ASHRAE's 2015 Annual Conference will take place in Atlanta, Georgia, June 27-July 1, 2015.

"The 2015 Annual Conference in Atlanta will have a strong focus on the design, construction and operation of high performance buildings as four of the nine tracks in the conference focus on advanced design guidance, modeling, operation and optimization, and indoor air quality which are key aspects of high performance buildings along with one track that explicitly considers measured results and other aspects of high performance buildings," said David Claridge, Technical Conference Chair.

A call for papers recently closed and some 130 abstracts were accepted, he said. As expected, there were a large number of submissions to the Systems and Equipment track. The Building Operation, Maintenance, and Optimization/Commissioning Track had the second-highest number of abstracts accepted.

A call for programs will be announced to round out the program, he said. The window for submitting program proposals for seminars, forums, workshops, etc. is January 5, 2015 to February 9, 2015.

The **Moving Advanced Energy Design Guidance to the Mainstream Track** focuses on the Advanced Energy Design Guides and seeks programs on methods for using the guides, including actual building case studies and other documented uses to move the market towards energy efficiency.

The **High Performance Buildings Track** extends ASHRAE's extensive activities in the design and measured performance of these buildings by seeking programs on these successes as well as identifying shortfalls where high performance has fallen considerably short of the design.

Real engineering as applied to operation, maintenance and operational optimization or “commissioning” can bring increased comfort and offers huge financial returns. The **Building Operation, Maintenance, and Optimization/Commissioning Track** seeks programs related to all aspects of this topic.

Computational capacity and data collection capability has expanded the scope, complexity and practical applications of modeling. The **Modeling throughout the Building Life Cycle Track** seeks programs related to all aspects of building modeling and, in particular, successful applications that have extended modeling into operational phases of the building life cycle.

Indoor air quality is closely linked to comfort and to occupant satisfaction, productivity and health. The **Indoor Air Quality Track** seeks programs that explore these links, particularly in ways that make the case for high levels of IAQ compelling to building owners.

The **Refrigeration Track** has an emphasis on related refrigeration technologies that will reduce the use of traditional refrigerants including evaporative cooling and desiccants.

As with past ASHRAE conferences, the Atlanta Conference also seeks programs addressing advances and practices across HVAC&R systems, equipment, fundamentals and applications.

Conference paper abstracts have been accepted for this conference. Papers are due Jan. 5, 2015. These papers undergo a single-blind review.

Reviews are currently being conducted on Technical Papers. These papers undergo a rigorous double-blind review and will be published in ASHRAE Transactions. If you would like to be a reviewer for Technical Papers, please contact Tiffany Cox, Conference Program Administrator, at [tcx@ashrae.org](mailto:tcx@ashrae.org).

[Contact Info/TracksSubmission ProcessPublication ScheduleAuthors' ResourcesLearning Objectives and Q&A](#)

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

**Track Chair: Jon J. Cohen / Rocky Alazazi**

**Email:** [jcohen@hohwatertechnology.com](mailto:jcohen@hohwatertechnology.com) / [mr.alazazi@yahoo.com](mailto:mr.alazazi@yahoo.com)

This track solicits papers and presentations on all aspects of HVAC&R Systems and Equipment. Efficiency is always important, so information on new and improved equipment and systems offering improved efficiency is particularly welcome.

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

**Track Chair: Ann Peratt / Cynthia Moreno**

**Email:** [agregg.ksu@gmail.com](mailto:agregg.ksu@gmail.com) / [cindym@tmmechanical.com](mailto:cindym@tmmechanical.com)

Fundamental information and applications of fundamentals related to all aspects of HVAC&R are welcome. This can range from fundamental psychrometrics to combustion, system and envelope fundamentals and beyond.

- **Track 3: Research Summit**

**Track Chair: Thomas H. Kuehn / Samir Traboulsi**

**Email:** [kuehn001@umn.edu](mailto:kuehn001@umn.edu) / [traboulsi.samir@gmail.com](mailto:traboulsi.samir@gmail.com)

This track will continue the highly successful Research Summit tracks pioneered at Denver and Seattle. Research results related to any aspect of heating, cooling and other energy uses in buildings are solicited.

- **Track 4: Refrigeration**

**Track Chair: Gary C. Debes / Monte G. Troutman**

**Email:** [gcdebes@verizon.net](mailto:gcdebes@verizon.net) / [montemechsys@bellsouth.net](mailto:montemechsys@bellsouth.net)

Refrigeration is a critical element of modern life, from preserving our food to maintaining comfort. The ozone depleting potential of the older refrigerants has led to adoption of non-ozone depleting refrigerants, with the focus now shifting to refrigerants with low global warming potential. These factors when combined with multiple drivers toward energy efficiency may lead to a diverse set of different refrigerants and processes for different cooling applications. This track will have presentations and papers from all areas of refrigeration and will particularly explore related technologies that will reduce the use of traditional refrigerants including evaporative cooling and desiccants.

- **Track 5: Building Operation, Maintenance and Optimization/Commissioning**

**Track Chair: Alan Neely / Mike McDermott**

**Email:** [alan\\_neely@pghcorning.com](mailto:alan_neely@pghcorning.com) / [mmcdermott@grummanbutkus.com](mailto:mmcdermott@grummanbutkus.com)

Operation and maintenance have always accounted for a major portion of building expenses and a much smaller level of engineering effort aimed at controlling these expenses. Over the last one to two decades, there has been an increasing realization that real engineering applied to operation, maintenance and operational optimization or “commissioning” can bring increased comfort and offers huge financial returns. This track solicits papers and presentations related to any and all aspects of this topic.

- **Track 6: Indoor Air Quality**

**Track Chair: Chuck Curlin / Dennis Alejandro**

**Email:** [ccurlin@shultzeg.com](mailto:ccurlin@shultzeg.com) / [denzjac@yahoo.com](mailto:denzjac@yahoo.com)

Indoor air quality has become a vital consideration during all phases of a building's life. It is closely linked to comfort and to occupant satisfaction, productivity and

health. This track seeks presentations and papers that explore these links, particularly in ways that make the case for high levels of indoor air quality compelling to building owners.

- **Track 7: Modeling throughout the Building Life Cycle**

**Track Chair: Jeffrey Spitler / Michael Collarin**

**Email:** [spitler@okstate.edu](mailto:spitler@okstate.edu) / [Michael.Collarin@parsons.com](mailto:Michael.Collarin@parsons.com)

Modeling was originally concerned primarily with building and system design specifications. The demands of energy efficient operation brought about the need for modeling of part-load operation for a variety of off-design conditions. The explosion of computational capacity and data collection capability is rapidly expanding the scope, complexity and practical applications of modeling both during design, but even more so for fault detection, diagnostics and operational optimization. Thirty years ago, people were dreaming of doing some of the things that Building Information Modeling is now bringing to reality. Presentations and papers are solicited related to all aspects of building modeling, with a particular interest in successful applications that have extended modeling into operational phases of the building life cycle.

- **Track 8: High Performance Buildings**

**Track Chair: Rachel Romero / Andrea Zarour / Mary Ann Piette**

**Email:**  
[rachel.romero@nrel.gov](mailto:rachel.romero@nrel.gov) / [azarour@greaterbaymechanical.com](mailto:azarour@greaterbaymechanical.com) / [mapiette@lbl.gov](mailto:mapiette@lbl.gov)

This track seeks papers and presentations on the design and measured performance of high performance commercial and industrial buildings in North America and around the world. There are numerous examples of buildings designed for high performance that have fallen considerably short of the design intent and papers that identify reasons for these shortfalls are of particular interest.

- **Track 9: Moving Advanced Energy Design Guidance to the Mainstream**

**Track Chair: James Liston / Paul A. Torcellini / Frank Schambach**

**Email:**  
[jliston@suffolk.com](mailto:jliston@suffolk.com) / [paul.torcellini@nrel.gov](mailto:paul.torcellini@nrel.gov) / [frankschambach@mindspring.com](mailto:frankschambach@mindspring.com)

This track focuses on the Advanced Energy Design Guides, with a circulation of over 500,000, and other like methods for reaching a broad audience with advanced energy efficiency. The target is a 50% reduction in energy. Papers and sessions focus on methods for using the guides including actual building case studies, educational curriculum, and other documented uses to move the market towards energy efficiency. Also, papers and sessions focus on the methods to create the guidance.

**Conference Program Chair: David Claridge**

Email: [dclaridge@tamu.edu](mailto:dclaridge@tamu.edu)

### **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](mailto:tc Cox@ashrae.org)

### **Technical Support**

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

## TC -6.1 Programs Look Ahead

<b>Year</b>	<b>2015</b>
<b>Date</b>	June 27 to 31
<b>City</b>	Atlanta
<b>Tracks</b>	<a href="http://www.ashare.org/atlanta/">www.ashare.org/atlanta/</a>
1	HVAC & R Systems and Equipment
2	HVAC & R Fundamentals and Applications
3	Research Summit
4	Refrigeration
5	Building Operation, Maintenance and Optimization/Comissioning
6	Indoor Air Quality
7	Modeling Throughout The Building Life Cycle
8	High Performance Building
9	Moving Advanced Energy Design Guidance to the Mainstream
<b>Technical Paper</b>	Paper: September 22, 2014
<b>Conference Paper</b>	Abstract: September 22, 2014; Paper: January 5, 2015
<b>Seminar</b>	Proposal: Febuary 9, 2015
	Design of Energy Efficent Hydronic Systems - David Lee and Robert Bean
<b>Forum</b>	Proposal: Febuary 9, 2015

## TC -6.1 Programs Look Ahead

<b>Year</b>	<b>Winter 2016</b>
<b>Date</b>	Jan 18-22
<b>City</b>	Orlando
<b>Tracks</b>	<a href="http://www.ashare.org/orlando/">www.ashare.org/orlando/</a>
1	HVAC & R Systems and Equipment
2	HVAC & R Fundamentals and Applications
3	Design Build
4	International Design
5	Standards, Guidelines and Codes
6	Cutting-Edge Technologies
7	The Great Debate
8	Modern Residential Systems
<b>Technical Paper</b>	Paper: April 19, 2015
<b>Conference Paper</b>	Abstract: March 19, 2015; Paper: July 2, 2016
<b>Seminar</b>	Proposal: August 13, 2015 ECM Motors for Distribution Pumps - Niels Bidstrup  Pressure Independent vs Pressure Dependent Control Valves - Bryson Borzini (P2S) Case study/Modeling and Larry Konopacz (B&G) Fundamentals and Robert Walker (Belimo) Chair Impact of Multiple Parallel Pumping Arrangements for Large Chilled Water Systems - Jason and Mike (GSH Case Study) Industrial Steam System Design Fundamentals and Applications- Rex Scare (Resubmit Chicago Program)
<b>Forum</b>	Proposal: August 13, 2015

## TC -6.1 Programs Look Ahead

<b>Year</b>	<b>Summer 2016</b>
<b>Date</b>	June 22-28
<b>City</b>	St. Louis
<b>Tracks</b>	<a href="http://www.ashare.org/stlouis/">www.ashare.org/stlouis/</a>
1	HVAC & R Systems and Equipment
2	HVAC & R Fundamentals and Applications
3	Research Summitt
4	
5	
6	
7	
8	
<b>Technical Paper</b>	Paper: September 24, 2015
<b>Conference Paper</b>	Abstract: Sept. 24, 2015; Paper: Feb. 25, 2016
<b>Seminar</b>	Proposal: February 11, 2016
	Chiller Plant Control Fundamentals and Optimization Workshop- Ed T
	Valve Sizing and Selection - Robert Walker with TC-1.4 Steve Taylor
<b>Forum</b>	Proposal: August 13, 2016

RESEARCH SUBCOMMITTEE REPORT  
ASHRAE TC 6.1 "Hydronic & Steam Heating Equipment & Systems"  
ASHRAE WINTER CONFERENCE – Chicago, Illinois  
Monday, January 26, 2015  
Thomas E. Cappellin – Chair

**NOTES FROM RESEARCH SUBCOMMITTEE CHAIR'S BREAKFAST:**

1. Service to ASHRAE Research Award
  - Iain Walker – TC 4.3 'Ventilation Requirements and Infiltration'.
2. ASHRAE Grants-in-Aid
  - 59 Grant-in-Aid Applicants (GIA) submitted by grad-students.
  - 21 Were approved for a \$10,000 Grant.
3. New Investigator Award
  - 14 Nominees were received from around the globe.
  - The winner will be announced at a later date.
4. RTAR and WS Status as of Chicago Meeting:
  - RAC evaluated 4 RTARs (conditionally accepted 3 / rejected 1).
  - RAC evaluated 8 WSs (conditionally accepted 5 / returned 2 with comments / rejected 1 with comments).
  - RAC approved 7 Tentative Research Projects (TRPs) for bid in Spring-2015.
    - i. 7 TRP bid packages were reviewed at the Chicago meeting.
  - RAC and TCs are currently reviewing 1 Unsubscribed Research Project (URP).
5. ASHRAE's Current Projects:
  - 59 active RPs having total value of \$ 11-million.
  - Since July, 2014:
    - i. 5 projects were started.
    - ii. 15 New Projects (TRPs) were approved for bid.
    - iii. No projects are on-hold due to a shortage of funding.

**NOTES FROM RESEARCH SUBCOMMITTEE MEETING:**

1. Mehdi Shahrestani RTAR:

RAC has rejected this RTAR (No. 1736) during ASHRAE's Annual meeting in Seattle-2014.

RAC's comments were:

- a. Project needs more justification before acceptance.
- b. Coordinate with other TC's, especially TC 1.4 and TC 4.7.
- c. Need is not well established.
- d. How would this study improve what is currently available in the market?
- e. By rejecting this RTAR, RAC is strongly suggesting to the TC that this particular topic be dropped from the TC research plan based on the information that has been provided.

- i. A copy of ASHRAE's Michael Vaughn (MORTS) is attached to this report for additional reference.

This Chair has approached the Research chairs of TC 1.4 and TC 4.7 to ask if they will review a revised/updated RTAR and express their thought to co-sponsor, approve, or recommendation that it be removed from consideration by RAC. Both subcommittee chairs agreed to review and provide their comments.

2. This Chair is striving to learn the progress of TC 6.1's current Research Project (RP-1196) 'Develop Software to Calculate the Application Seasonal Efficiency of Commercial Space Heating Boiler Systems Based on ASHRAE Standard 155P'. There has been correspondence with TC 6.1's Project Subcommittee to determine the status of the project's development. This project appears to be lagging due to the recent retirement of the project contractor team leader (Iowa State University, Ames, IA).
  - a. The Team Lead has agreed to finish the project if provided with an additional year in which to complete the work and issue a final report in accordance with the original contract. This would be done at no additional cost to ASHRAE but needs the approval of the University for the Team Leader to use university equipment and facilities for the work.
  - b. This Chair will request ASHRAE's RAC/MORTS for approval to allow the extension of one year for the project to be completed
3. Review of additional topics for development into RTAR submittals:
  - a. RTAR – 'Testing automatic fluid control valves for flow limiting and flow regulating characteristics to determine if their built-in control devices perform with accuracy and dependability needed to achieve their design control strategy' (Robert Walker, author).
    - i. Prior to preparing this RTAR, Research Subcommittee will review sections of Standard 75 (ANSI/ISA-75) to determine if any of this standard's sections already address the above subject.
  - b. RTAR - Copper Tube Fitting Flow Factors and the Hydronic Coil Characteristic Modeling (Mark Hegberg).
  - c. RTAR - Allowance for Aging in Steel and Iron Pipes installed in open hydronic piping systems (Scott Fisher and Mark Hegberg).
4. Motion was tendered to adjourn (and unanimously accepted) the TC 6.1 Research Subcommittee meeting.

#### END OF MINUTES

Attachments: Attendance Sign-in sheets – two pages.  
1736-RTAR RAC letter with comments.

# ATTENDANCE LIST

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

3:15 - 4:15pm - Monday, January 26, 2015 - Hancock Room 6th Floor

(YE4)?

Name	Company and Address	Committee Position	Preferred Phone or E-mail Address
Thomas E. Cappellin	Cappellin Consulting Services 7209 Torrington Way Springfield, IL 62711	Subcommittee Chair	tcappellin@msn.com
Jason Atkisson	Affiliated Engineers, Inc.	Hardbook Subcom Chair	jatkisson@aeteng.com
Rex Seave	Armstrong Intl	Vice Chair	Rex@armstronginternational.com
BOB WALKER	BELIMO	Secretary	robert.walker@us.belimo.com
Larry Konopcz	Xylem, Inc. Morton Grove, IL	CM	Larry.Konopcz@xyleminc.com
Steve Hancock	TEWE RESIDENTIAL	TRC Chairman	Steve.Hancock@tco.com
Gang Wang	University of Miami	Guest	g.wang2@miami.edu
DAVID LEE	ARMSTRONG FLUID TECHNOLOGY	CM	dlee@armstrongfluidtechnology.com

# ATTENDANCE LIST

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

3:15 - 4:15pm - Monday, January 26, 2015 - Hancock Room 6<sup>th</sup> Floor

Name	Company and Address	Committee Position	Preferred Phone or E-mail Address
Byron Baroni	P23 Engineering	Guest	byron.baroni@p2eng.com
Mike McBERTHOTT	GRUMMAN BUTKUS		mmedems@grummanbutkus.com



Shaping Tomorrow's  
Built Environment Today

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FROM: Michael Vaughn, MORTS, [mvaughn@ashrae.org](mailto:mvaughn@ashrae.org)

DATE: July 24, 2014

SUBJECT: Research Topic Acceptance Request (1736-RTAR), "A novel approach for modeling of hydronic systems in Building Performance Simulation (BPS) tools "

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During their recent Annual meeting, the Research Administration Committee (RAC) reviewed the subject Research Topic Acceptance Request (RTAR) and voted 5-0-0 to reject it. The following is the consensus reason for rejecting this RTAR:

1. Project needs more justification before acceptance.
2. Coordinate with other TC's, especially TC1.4 and TC 4.7.
3. Need is not well established.
4. How would this study improve what is currently available in the market.

By rejecting this RTAR, RAC is strongly suggesting to the TC that this particular topic be dropped from the TC research plan based on the information that has been provided.

An RTAR evaluation sheet is attached as additional information and it provides a breakdown of comments and questions from individual RAC members based on specific review criteria. This should give you an idea of how your RTAR is being interpreted and understood by others.

If the TC wishes to pursue this topic further, please address the above issues noted by RAC in a revised version of the RTAR with the help of your Research Liaison, Arthur Giesler, [RL1@ashrae.net](mailto:RL1@ashrae.net), prior to submitting it to the Manager of Research and Technical Services for further consideration by RAC. In addition, a separate document providing a point by point response to each of these comments and questions must be submitted with the RTAR. The response to each item should explain how the RTAR has been revised to address the comment, or a justification for why the Technical Committee feels a revision is unnecessary or inappropriate. The RTAR and response to these comments and questions must be approved by the Research Liaison prior to submitting it to RAC.

The next submission deadline for RTARs and WSs is **August 15, 2014** for consideration at the Society's 2014 fall meeting. The submission deadline after that is December 15, 2014.

Project ID	1736		
Project Title	A novel approach for modeling of hydronic systems in Building Performance Simulation (BPS) tools		
Sponsoring TC	TC 6.1. Hydronic & Steam Equipment & Systems		
Cost / Duration	397,650 / 12M		
Submission History	RTAR 1st Submission		
Classification: Research or Technology Transfer	Basic/Applied Research		
RAC 2014 Annual Meeting Review			
Check List Criteria	VOYED NO	Comments & Suggestions	
Is there a well-established need? The RTAR should include some level of literature review that documents the importance/magnitude of a problem. If not, then the RTAR should be returned for revision.		#10 - Need is not well established. It is not well stated the inaccuracies due to current approach in the calculations and resulting impact on the prediction of energy performance. #14- Maybe, but the case isn't clearly presented here. #7 - Would like to know how this study would improve what is currently available in the market. How inaccurate are the commercially available software packages? #2- Improvement in the simulation of the hydronic systems will provide better results and better understanding of the effect of different designs on a building's performance. #13 - Component models and a control system evaluation framework were developed in 825-RP. There is an existing RTAR from TCA7 and TC1.4 that addresses substantial parts of the proposed work. (Need for TC coordination). DOE is developing an implementation of this approach using Modelica for incorporation in Energy Plus for supervisory control. There is a need for a controls design tool shell for a Modelica/Energy Plus implementation. #8 - The definition and performance requirements of "a novel approach" seem vague. The contractor could define based on higher own understanding or preference, leading to the quality of research potentially difficult to evaluate.	
Is this appropriate for ASHRAE funding? If not, then the RTAR should be rejected. Examples of projects that are not appropriate for ASHRAE funding would include: 1) research that is more appropriately performed by industry, 2) topics outside the scope of ASHRAE activities.		#8- The project requires contractor to integrate the hydraulic model into an existing energy simulation tool such as Energy Plus or TRNSYS. This may be difficult for contractors who does not have prior experience developing those BPS tools.	
Is there an adequate description of the approach in order for RAC to be able to evaluate the appropriateness of the budget? If not, then the RTAR should be returned for revision.		#10 - There are several flow network analysis software both in public and commercial domain which can perform this analysis. It should be noted the key component in these analyses is pressure loss data of each element in the flow network. #7 - Would like to see more elaboration on how this study would vary from current methodology. #13 - A bigger challenge than developing component models is the development of a platform with robust numeric's and an effective user interface. #8- The objectives need to be clear. Otherwise the level of efforts in both modeling and experimental validation are difficult to evaluate.	
Is the budget reasonable for the project scope? If not, then RTAR could be returned for revision or conditionally accepted with a note that the budget should be revised for the WS.		#14 - Seems like a very odd budget. Is this an RTAR estimate or a price quote? #7 - Hydronic component manufacturers should provide co-funding. #13 - Already done for TRNSYS, implementation in Energy Plus would require > \$100k. #8 - The budget should be an estimate and leave to the contractor to give an accurate number. #4 - As a non-specialist, I think there might be some key missing links. The RTAR refers to issues of non-linearity, particularly in valves (or different types), but I just don't know if there is enough documentation to guide designers of different types of variable flow hydronic systems about specifications they need for their systems. Tied to this is another area where I'm ignorant sort of an "extended products" question. Should engineers' design tools include modules that assure that branch controls are optimizing (valves and pumping)? How does this tie to some of the newer VSD cartridge pumps for zone control, and how they do or don't interact with boilers (or other heat/cool sources)? I'd like to know how this RTAR fits into the TC's overall research plan, which I think should drive toward making good, robust designs easier for the consultant.	
Have the proper administrative procedures been followed? This includes recording of the TC vote, coordination with other TCs, proper filing of the Research Strategic Plan, etc. If not, then the RTAR could be returned for revision or possibly conditionally accepted based on adequately resolving these issues.		#4 - seems ok	
Decision Options	Initial Decision	Approval Conditions	
ACCEPT		#7 - Project needs more justification before acceptance. #13 - Coordinate with other TC's, esp. TC1.4 and TCA7. #4 - I need a briefing to help me understand why this is the critical path, why my concerns are unfounded, and how this fits on the path to better designs and implementation. I'd also like to see more emphasis on tech transfer to the working designers, for example with an ASHRAE Journal article (journals and how to avoid them?)	
COND. ACCEPT			
RETURN			
REJECT			

ACCEPT Vote - Topic is ready for development into a work statement (WS).  
 COND. ACCEPT Vote - Minor Revision Required - RL can approve RTAR for development into WS without going back to RAC once TC satisfies RAC's approval condition(s)  
 RETURN Vote - Topic is probably acceptable for ASHRAE research, but RTAR is not quite ready.  
 REJECT Vote - Topic is not acceptable for the ASHRAE Research Program

## TC 6.1 Handbook Subcommittee Minutes

January 25, 2015

2015 Winter Meeting – Chicago

### Attendees:

Jason Atkisson  
Bob Walker  
David Lee  
Thomas Neill  
Steve Severini

Eric Rosenberg  
Jessica Mangler  
Edward Tsui  
Bryson Borcom  
Stan Kutin

Steve Tredinnick  
Drew Overmiller  
Niels Bidstrup  
Jack Kibort  
Rex Scare

1. Introductions of Attendees
2. Seattle Meeting Minutes were approved.
3. Reviewed Committee Assigned Handbook Chapters & Status

### 2016 Systems and Equipment

Chapter	Title	Lead Author	Status
11	Steam Systems	Ramez Afify	<ul style="list-style-type: none"><li>▪ Preliminary Review by Lead Author is complete</li><li>▪ Awaiting Final Review by Volunteer Reviewers</li><li>▪ Will require a proxy vote by sub-committee and full committee</li></ul>
13	Hydronic Heating & Cooling System Design	Mick Schwedler	<ul style="list-style-type: none"><li>▪ Approved by TC</li><li>▪ Ready to send to Handbook</li></ul>
14	Condenser Water Systems	Steve Tredinnick	<ul style="list-style-type: none"><li>▪ Approved by TC</li><li>▪ Ready to send to Handbook</li></ul>
15	Medium and High Temperature Water Heating Systems	N/A	<ul style="list-style-type: none"><li>▪ Not being edited.</li><li>▪ TC 6.2 to assume responsibility beyond 2016</li><li>▪ Sent to Full TC for vote</li></ul>
28	Unit Ventilators, Unit Heaters and Makeup Air Units	Scott Fisher	<ul style="list-style-type: none"><li>▪ TC 5.3/5.8 to assume responsibility beyond 2016</li><li>▪ Sent to Full TC for vote</li></ul>
32	Boilers	Evans Lizardos	<ul style="list-style-type: none"><li>▪ In Need of Updating</li><li>▪ Sent to Lead Author/Reviewers</li><li>▪ Will require a proxy vote by sub-committee and full committee</li></ul>
36	Hydronic Heat Distribution Units and Radiators	Scott Fisher	<ul style="list-style-type: none"><li>▪ Minor Updates by Lead Author complete</li><li>▪ Will require a proxy vote by sub-committee and full committee</li></ul>

44	Centrifugal Pumps	Neils Bidstrup	<ul style="list-style-type: none"> <li>▪ Nearly Complete</li> <li>▪ Final edits due 2/15/15</li> <li>▪ Will require a proxy vote by sub-committee and full committee</li> </ul>
46	Pipes, Tubes, & Fittings	N/A	<ul style="list-style-type: none"> <li>▪ Not being edited.</li> <li>▪ Chapter being eliminated after 2016</li> <li>▪ Sent to Full TC for vote</li> </ul>
47	Valves	Bob Walker	<ul style="list-style-type: none"> <li>▪ Nearly Complete</li> <li>▪ Final edits due 2/15/15</li> <li>▪ Will require a proxy vote by sub-committee and full committee</li> </ul>
48	Heat Exchangers	Scott Fisher	<ul style="list-style-type: none"> <li>▪ Approved by TC</li> <li>▪ Ready to send to Handbook</li> </ul>

#### 2017 Fundamentals

<b>Chapter</b>	<b>Title</b>	<b>Lead Author</b>	<b>Status</b>
22	Pipe Design: Fundamentals, Pipe Materials, and Applications	Scott Fisher	<ul style="list-style-type: none"> <li>▪ Preliminary Review by Lead Author is complete</li> <li>▪ Awaiting Final Review by Volunteer Reviewers</li> </ul>

4. Adjourn