AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS, INC.

1791 Tullie Circle, NE / Atlanta, GA 30329
404-636-8400

TC/TG/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/TRG No. TC 4.7 DATE: June 23, 2013

TC/TG/TRG TITLE: Energy Calculations

DATE OF MEETING: January 29, 2013 LOCATION: Dallas

MEMBERS PRESENT	YEAR APPTD	MEMBERS ABSENT	YEAR APPTD	EX-OFFICIO MEMBERS & ADD'L ATTENDANCE
Tim McDowell (CHAIR)	2012	Iain Macdonald	2009	See attendance list for additional attendees.
Joe Huang (V CHAIR, APP SC CHR)	2012			
Chip Barnaby (HDBK SC CHR)	2012	Malcom Cook	2012	
Chris Balbach (PRGM, DDM SC CHR)	2012			
Russ Taylor	2010			
Dan Fisher	2011			
Bass Abushakra (SEC)	2012			
Michael Wetter	2011			

Total attendance of voting members: 8 present, 2 absent.

DISTRIBUTION

ALL MEMBERS OF THE TC/TG/TRG

TAC CHAIR	Michael Bilderbeck , Charles Culp
TAC SECTION HEAD	
SPECIAL PUBLICATIONS LIAISON	William Fleming
STANDARDS LIAISON	James Tauby
HANDBOOK LIAISON	Peter Simmonds
RAC RESEARCH LIAISON	Srinivas Garimella
PROF DEV COMM LIAISON	John Nix
CHAP TECH TRANSFER LIAISON	Harris Sheinman
STAFF LIAISON (RESEARCH)	Michael Vaughn
STAFF LIAISON (TECH SERVICES)	Michael Vaughn
STAFF LIAISON (STANDARDS)	Stephanie Reiniche

These draft minutes have not been approved and are not the official, approved record until approved by this committee.

ASHRAE TC 4.7 Energy Calculations
San Antonio Meeting

MOTIONS AND ACTION ITEMS

MOTION: Tim McDowell moved, Chris Balbach seconded, to accept the minutes. Motion passes 7-0-0, Chair not voting.

MOTION: Tim McDowell moved, seconded by J. Huang, to write a letter to ASHRAE to support that TC4.7 should take responsibility of maintaining the USDOE reference buildings simulation models. Motion passes 7-0-0 Chair not voting.

MOTION: C. Balbach moved, seconded by T. McDowell, to approve the program. Motion passes 7-0-0, Chair not voting.

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TC/TG/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/TRG No. TC 4.7 DATE: June 22, 2013

TC/TG/TRG TITLE: Energy Calculations

DATE OF MEETING: January 29, 2013 LOCATION: Dallas

TC/TG/TRG MEETING SCHEDULE

LOCATION – past 12 months	**DATE**	**LOCATION - planned next 12 months**	**DATE**
San Antonio	Jun. 26, 2012	New York	January 21, 2014
Chicago	Jan 24, 2012	Seattle	July 1, 2014

TC/TG/TRG SUBCOMMITTEES

Function	**Chair**
Program	Chris Balbach
Research	Jeff Haberl
Handbook	Erik Kolderup

RESEARCH PROJECTS – Current		**Monitoring**	**Report Mode**
Project Title	**Contractor**	**Comm.Chm.**	**At Meeting**
Appendix 1			

LONG RANGE RESEARCH PLAN

Rank	Title	W/S Written	Approved	To R & T
	Appendix 2			

HANDBOOK RESPONSIBILITIES

Year & Volume	Chapter Title	**No.**	Deadline	**Handbook Subcom. Chair/Liaison**
2013 Fundamentals	Energy Estimating Methods	19	July 2012	Barnaby, /Simmonds

STANDARDS ACTIVITIES - List and Describe Subjects

SPC 140 Standard Method of Test for Building Energy Software – Joel Neymark
SPC 205 Data Exchange Protocols for Energy Simulation of HVAC&R Equipment Performance - Chip Barnaby
SPC 209 Energy Simulation Aided Design for High-Performance Buildings - Jason Glazer

TECHNICAL PAPERS from Sponsored Research - Title, when presented (past 3 yrs. present & planned)

Appendix 3

TC/TC/TRG Sponsored Symposia - Title, when presented (past 3 yrs. present & planned)

Appendix 4

TC/TG/TRG Sponsored Seminars - Title, when presented (past 3 yrs. present & planned)

Appendix 5

TC/TG/TRG Sponsored Forums - Title, when presented (past 3 yrs. present & planned)

Appendix 6

JOURNAL PUBLICATIONS - Title, when published (past 3 yrs. present & planned)

None

Attendance

Below is a complete listing of attendees at this meeting. It includes the voting members listed on the first page

Last Name	First Name	Affiliation	E-mail	Status 01/13 VM Voting CM Corres. V Visitor
Abushakra	Bass	Milwaukee School of Eng'g		VM
Baker	Chris	The Weidt Group		V
Balbach	Chris	Perf. Systems Develop.		VM
Baltazar	Juan-Carlos	TAMU		V
Barnaby	Chip	Wrightsoft		VM
Bilderbeck	Mike	Pickering Firm		V
Bosworth	David	BuildLab		V
Cockerham	Keith	DLB Associates		CM
Collyer	Breesa	PG&E		V
Cook	Malcolm	Loghborough Univ (UK)		VM
Cornick	Steve	NRC Canada		V
Crawley	Dru	Bentley		CM
Cumali	Zulfi	Energy System		V
Degelman	Larry	TAMU		CM
DeGraw	Jason	Penn State		V
Ellis	Peter	Big Ladder Software		CM
Fisher	Dan	Oklahoma State Univ		VM
Glazer	Jason	GARD Analytics		
Haberl	Jeff	TAMU		CM
Haddad	Kamel	NRCan		CM
Haves	Philip	LBNL		CM
Howard	Jeff	KWHours		V
Huang	Joe	White Box Technologies		VM
Jain	Semant	Goodman Mfg.		V
Judkoff	Ron	NREL		CM
Kinney	Kris	KES		CM
Kolderup	Erik	Kolderup Consulting		CM
Kruis	Neal	NREL		CM
Lin	Cheng-Xian	Florida Int. Univ.		V
McDowell	Tim	TESS		VM
Miura	Mayumi	Azbil Co.		V
Muthopallujay	Jaya	TAMU		V
Nelson	Ron	IMT		CM
Neymark	Joel	J. Neymark & Assoc		CM
Pegues	Jim	Carrier		V
Pruett	John	ZMM, Inc.		V
Reddy	T. Agami	Arizona State Univ		V
Shirey	Don	Bentley		V
Sobrevilla	Andres	Munters		V
Subbarao	Kris	PNNL		V
Tabares	Paulo	NREL		V
Taylor	Russel	UTRC		VM
Varela	Ignacio	Heatcraft		V
Wetter	Michael	LBNL		VM
Witte	Michael	GARD Analytics		V
Zuo	Wangda	LBNL		CM

Appendix 1
TC 4.7 RESEARCH PROJECTS STATUS

ASHRAE
Technical Committee 4.7 Energy Calculations
(January 29, 2013)

Active projects

#	Title	Joint TC	Cog SC/ Contractor	PMSC	Dates / status
1413-RP	Developing Standard Procedures for Filling Climatic Data Gaps for Use in Building Performance Monitoring and Analysis.	4.2	Univ. of Oklahoma	PMS: Didier Thevenard: (chair TC 4.2), Chip Barnaby, Steve Cornick, Neal Lott	Underway., expected completion July 2013.

Appendix 2
RESEARCH PLAN

ASHRAE
Technical Committee 4.7 Energy Calculations
2013 Research Plan (January 29, 2013)

Title	Society status	TC 4.7 Status	Actors or TC 4.7 Prime Contact	Subcom-mittee*
Active projects				
1413-RP Developing Standard Procedures for Filling Climatic Data Gaps for Use in Building Performance Monitoring and Analysis.	Project underway	Third PMSC meeting held in Dallas, 2013	Contractor: U. of Oklahoma, PMS: Didier Thevenard: (chair TC 4.2), Chip Barnaby, Steve Cornick, Neal Lott	APP
WSs approved by TC				
1588-WS Procedure to create hypothetical layer-by-layer fenestration descriptions when only the bulk properties such as U-factor and SHGC have been defined	Approved by RAC for Bidding, Spring 2013	-	Joe Huang (WS author), proposed PES Jeff Haberl (chair), Chip Barnaby, Tim McDowell, + TC4.5 rep to be determined	APP
1629-WS Testing and Modeling Energy Performance of Active Chilled Beam Systems;	Approved by RAC for Bidding, Spring 2013	-	Responsible Committee: TC 5.3 (Room Air Distribution); Co-Sponsors: TC 4.7 (Energy Calculations)	APP
WS under development				
1629-WS (Chilled Beams)	Awaiting WS	WS under development	Wangda Zuo, Joe Huang , Simon Rees, Eric Kolderup, Malcolm Cook, Iain Macdonald	SCM

Appendix 3
TECHNICAL PAPERS FROM SPONSORED RESEARCH

RP	Title	Contractor	Approved	Paper
1404	Improvements to Climatic Data for ASHRAE Design Calculations	Milwaukee School of Engineering	Dallas January 2013	Reddy, T.A., Singh, V., and Abushakra, B. 2013, "Predicting Annual Energy Use in Buildings Using Short-Term Monitoring: The Hybrid Inverse Model Using Daily Data (HIM-D)"
1051	Procedures for Reconciling Computer-calculated Results with Measured Energy Data	Drexel	Chicago January 2006	Reddy, T.A., 2006. "Literature Review on Calibration of Building Energy Simulation Programs: Uses, Problems, Procedures, Uncertainty and Tools", ASHRAE Transactions, vol 112(1).
1051	Procedures for Reconciling Computer-calculated Results with Measured Energy Data	Drexel	Chicago January 2006	Sun J. and Reddy T.A., 2006, "Calibration of Building Energy Simulation Programs Using the Analytic Optimization Approach (RP-1051)", Int. J HVAC&R Research 12(1) 177-196.
1051	Procedures for Reconciling Computer-calculated Results with Measured Energy Data	Drexel	Chicago January 2006	Reddy, T.A., I. Maor and C. Ponjapornpon, 2006, "Calibrating Detailed Building Energy Simulation Programs with Measured Data- Part I: General Methodology", accepted for publication in Int. J HVAC&R Research.
1051	Procedures for Reconciling Computer-calculated Results with Measured Energy Data	Drexelh	Chicago January 2006	Reddy, T.A., I. Maor and C. Ponjapornpon, 2006, "Calibrating Detailed Building Energy Simulation Programs with Measured Data- Part II: Application to Three Case Study Office Buildings", accepted for publication in Int. J HVAC&R Research.
865	Accuracy Tests for Simulations of VAV Dual Duct, Single Zone, Four Pipe Fan Coil and Four Pipe Induction Air Handling Systems (4796)	Univ Nebraska, Texas A&M	July 2002	Yuill, G., Haberl, J. 2006. "Accuracy Tests for Simulations of VAV Dual Duct, Single Zone, Four Pipe Fan Coil and Four Pipe Induction Air Handling Systems (4796)," ASHRAE Transactions-Research, Vol. 112, Pt. 1 (January).
865	Accuracy Tests for Simulations of Constant Volume, Dual Duct and Variable Volume	Univ. Nebraska, Texas A&M	July 2002	Yuill, G., Haberl, J., Caldwell, J. S. 2005. "Accuracy Tests for Simulations of Constant Volume, Dual Duct and Variable Volume Air Handling Systems (4796, RP-865),"

	Air Handling Systems (4796).			ASHRAE Transactions-Research, Vol. 111, Pt. 2, No. 4796, pp. 137 – 153 (June).

Appendix 3 (continued)

1050	Development of an Inverse Model Toolkit	Univ. of Dayton, Texas A&M	December 2001	Kissock, K., Haberl, J., Claridge, D. 2003. "Inverse Model Toolkit (1050-RP): Numerical Algorithms for Best-Fit Variable-Base Degree-Day and Change-Point Models," ASHRAE Transactions-Research, Vol. 109, Pt. 2, pp. 425 – 434.
1050	Development of an Inverse Model Toolkit	Univ. of Dayton, Texas A&M	December 2001	Haberl, J., Claridge, D., Kissock, K. 2003. "Inverse Model Toolkit (1050-RP): Application and Testing," ASHRAE Transactions-Research, Vol. 109, Pt. 2, pp. 435 – 448.
1093	Diversity Factors and Schedules for Energy and Cooling Load Calculations	Texas A&M	June 2000	Abushakra, B., Haberl, J., Claridge, D. 2004. "Overview of Literature on Diversity Factors and Schedules for Energy and Cooling Load Calculations (1093-RP)," ASHRAE Transactions-Research, Vol. 110, Pt. 1 (February), pp. 164 – 176.
1093	Diversity Factors and Schedules for Energy and Cooling Load Calculations	Texas A&M	June 2000	Claridge, D., Abushakra, B., Haberl, J. 2003. "Electricity Diversity Profiles for Energy Simulation of Office Buildings (1093-RP)," ASHRAE Transactions-Research, Vol. 110, Pt. 1, pp. 365 – 377 (February).

Appendix 4
TC/TG/TRG SPONSORED SYMPOSIA

Current as of JANUARY 2013

PRESENT:

PLANNED:

PAST:

Louisville, June 20-24, 2009

Transaction "Improving Load Calculations for Fenestrations with Shading Devices"

Chicago, January 24-28, 2009

HVAC&R Research Seminar "Synthesis of Optimum HVAC System Configurations"

New York City/January 2008

How Low Can You Go?

Recent Advances in Energy Simulation (Chair: Dan Fisher)

How Low Can You Go? Low-Energy Buildings Through Integrated Design (Chair: Dru Crawley)

Application of Inverse Models (Chair: Jeff Haberl)

Appendix 5
TC/TG/TRG SPONSORED SEMINARS
Current as of January 2013

PRESENT:

Dallas, January 26-30, 2013

"Data Visualization 101"
Chair: Chris Balbach
Three Speakers: Jeff Haberl, Joe Huang, John Kie-Whan Oh

PLANNED:

Under development ideas for seminars:

- Rule-based compliance simulations (APP SC)
- Using annual simulations to evaluate design sizing (APP SC)
- Data visualization (DDM SC)
- How to model atria spaces (SCM SC)

PAST:

San Antonio, June 23-27, 2012

"Three perspectives on SPC 205P" (title TBD)
Chair: Chip Barnaby
Three proposed speakers, including a consumer of 205P, a product manufacturer , and a software vender

"Using measured data of various fidelity with simulations"
Chair: Dave Bosworth
Speakers: Eric Bonnema, Jesse Dean, Tim McDowell

"Methods for quantifying water savings using regression models"
Chair: Chris Balbach (may be changed)
Speakers: Chris Balbach, Jerone Gagliano, Jeff Haberl

Chicago, January 21-25, 2012

Standard 205P: Hassle-Free Equipment Performance Data for Energy Modeling (Chair: Chris Balbach)
Improving Energy Modeling Consistency (Chair: Joe Huang)

Integrated Multi-domain Simulations for Innovative Building Design and Operation, Part One (Chair: Wangda Zuo)

Integrated Multi-domain Simulations for Innovative Building Design and Operation, Part Two (Chair: Jerone Gagliano)

Las Vegas, Jan 29-Feb 2, 2011

Building Energy Simulation 102 (Chair: Keith Cockerham)
Energy Modeling of Existing Buildings (Chair: Sue Reilly)

Albuquerque, June 26-30, 2010

Building Energy Simulation 101 (Chair: Tim McDowell)
Simulation of HVAC/R equipment and systems using the limited data published by manufacturer

(Chair: Michael Wetter)

Appendix 5 (continued)
TC/TG/TRG SPONSORED SEMINARS

Orlando, January 23-27, 2010

Web-based Programs for Calculating Energy Code-Compliance (Chair: Larry Degelman)
How to Assess the Performance of Sustainable Buildings (Chair: Moncef Krarti)

Louisville, June 20-24, 2009

Energy modeling of large buildings systems

Salt Lake City June 21-25, 2008

Use of Equation Solvers for Simulation (Chair: Michael Wetter)

New York City/January 2008

How to model nothing – Energy Modeling for Zero Net Energy Buildings: Parts 1 & 2 (Chair: Jan Kosny)

Long Beach/June 2007

Simulation Support for the 2007 Solar Decathlon (Chair: Kamel Haddad)

Dallas/January 2007

Use of Equation Solvers for Simulation (Chairs: Jean Lebrun/Mike Wetter)
Applications of Computer Simulation in High Performance Buildings (Chair: Martha Brook)

Québec City/June 2006

None

Chicago/January 2006

How and Why to Calibrate a Simulation to Measured Data (Chair: Robert Sonderegger)
Application and Experiences with the New Simulation Software (Chair: Dan Fisher)

Denver/June 2005

Neglected Topics in Building Simulation (Chair: Ian Beausoleil-Morrison).

Orlando/January 2005

What to do When Data Misbehave (Chair: Agami Reddy)

Appendix 6
TC/TG/TRG SPONSORED FORUMS

Current as of January 2013

PRESENT:

Dallas, January 26-30, 2013

None

PLANNED (w/priorities):

None

PAST:
Jun 26-30, 2012 – San Antonio

None

Chicago, January 24-28, 2009

"Limitation of Energy Simulations for NZEB" (Chair: Tim McDowell)

Chicago/January 2006

"What Controls Modeling Capabilities are Needed for Energy Simulations?" (Chair: Philip Haves)

ASHRAE TC 4.7 Energy Calculations
Tuesday, JANURAY 29, 2013, 6:00-8:30 p.m.
Dallas

Minutes of TC 4.7 full meeting

Quorum Members:

Present:

(1) McDowell, (2) Huang, (3) Abushakra, (4) Balbach, (5) Fisher, (6) Wetter, (7) Taylor, (8) Barnaby.

Absent:

(1) MacDonald, (2) Cook (non-quorum)

Minutes (*recorded by B. Abushakra*)

- 6:04 Tim started the meeting with Introductions.
- Roll call: 8 present, 1 absent, 1 non-quorum absent.
- A motion passed, to accept the agenda and approve the minutes (without parts were missing); 8-0.
- Hightower Award this year went to a member of TC1.10.
- A new presentation template from TAC members can use o make presentation to their local chapters. Chapters are encouraged to seek TC members to present in the monthly meetings.
- Australia is moving on carbon tax.
- Looking for volunteers to review technical and conference papers.
- Possible to have TC and Subcommittee meetings using conference calls, between conferences. Requests should go directly to Mike Vaughn, or to the TC chair.
- Upcoming conferences: IEA Heat Pump conference.
- There's a new ASHRAE Terminology Wiki.
- We should recognize a code of ethics.
- Membership:
    - Rolling off: Huang, McDonalds,Taylor. Rolling on: Judkoff, Haddad, Cockerham…..
    - New officers in chairing subcommittees: Balback – DDM, Kolderup – Handbook, ….
- Subcommittee reports:
    - Applications (Huang):
        - Research: we have one WS (Fenestrations, layer by layer, approved and put out for bid this coming Spring)
            - Discussed 4 new ideas (from San Antonio). We finally have some activity done to develop seminars (one is on COMNET; another is on Annual Simulations to be used as Design Calculations; RTAR on actual performance of building is still under development; lastly, whether TC 4.7 should have a responsibility of maintaining the existing DOE input files of reference building. Dru noted that an MTG took this over last summer (to maintain these reference buildings models).
            - A motion passed that Tim writes a letter to ASHRAE to support that we should take the responsibility of maintaining these reference buildings model.
    - DDM (Balbach):
        - Research:
            - Updating the IMT with new models (a small working group was formed (Haberl) to write an RTAR).
    - SCM (Crawly):

ASHRAE TC 4.7 Energy Calculations (page 2 of 4)
Tuesday, JANURAY 29, 2013, 6:00-8:30 p.m.
Dallas

Minutes (continued)

        - Research:
            - Co-sponsor and RTAR from 1.9.
    - Research (Haberl):
        - WS1629 (chilled beams) was passed around
        - RTAR 1661 was previously rejected and M. Wetter is interested in re-writing it, and probably it would be ready for Denver.
        - RTAR 1676 was also previously rejected. The committee does not feel like will rewrite it (the author is not interested in rewriting it). Discussion followed that the utilities is actually eager to use results of research that would come out of this project (Sonderegger).
        - RP1404 was completed and two papers are submitted.
        - WS1588 is finally coming out for bid from RAC.
        - RP1468 is complete, and Mike Vaughn is trying to make the DVD available.
        - RP1414 (with TC4.2) is in progress.
        - RTARxxx Natural Ventilation, a follow-on work from a previously completed RP.
        - WS 1629 revised, including a tighter parametric set of experimental test was included. Co-sponsored by TC5.3 (approved today). TC 4.7 approved co-sponsoring (8-0-0 Chair not voting).
        - RTARXXX (BIM) we're waiting till TC1.5 sponsored. It's an RTAR that was decided to be bumped up to be a WS. Two comments came out. No test-suites for daylighting models to work with BIM exist. (for instance BIM-to-Daylighting, BIM-to-Thermal).
    - Section Head: Orlando will have internet access during the meeting ($300K cost).
    - Handbook:
        - Barnaby: 2013 Handbook chapter was submitted to ASHRAE; it was brought up-to-date; a graduate student from Texas A&M did the update of the references.
        - Lessons learned from the effort in reviewing the 2013 chapter, in order to form a list of prioritized tasks for 2017. Kolderup will be the chair working on the 2017 chapter.
    - Program:
        - Cockerham: there is still time to submit papers for NY (April 19 technical papers due).
        - Update on conference papers and technical papers.
        - Ideas for program:
            - Applications (Rule-based compliance simulations Seminar; Using annual simulations to evaluate design sizing Seminar)
            - Data-Driven Modeling: (Data visualization).
            - SCM: (How to model atria spaces Seminar)
        - A discussion on Ethics erupted, started by the Section Head.
        - A motion to approve the program passed.
    - Standards:

ASHRAE TC 4.7 Energy Calculations (page 3 of 4)
Tuesday, JANURAY 29, 2013, 6:00-8:30 p.m.
Dallas

Minutes (continued)

- Judkoff: SSPC 140: working on adding to Standard 140, RP865 is incorporated in the standard; got resource to update the specs of IEA building fabric Bestest; 12 simulation programs were approved by the IRS (Tax credit); RESNET will stop reference the NREL Bestest, and will start referencing Standard 140; a request for test-suites for standard 140; a method to "test calibration methods" to be introduced in the next RESNET meeting.
- Chip: SPC 205: Standard 205: standardizing data format for equipment performance data to be transferred automatically to simulation program with programming interference by users and developers.
- Long: SGPC 20:
- Haves (Glazer): SPC 209: A discussion on the scope of the standard, where to draw the line. The committee is organized into 4 subcommittees (conceptual design, pre-design, as-built, etc..).

- Web site: is updated with new information.
- Related activities reports:
  - SPC 191: None reported.
  - MTG.EAS: Haberl: we're still gathering Bios from members, and conference calls requested ideas from members, and still in early stages.
  - TC2.8: None reported.
  - TC4.1: Fisher: A couple of lighting heat gains from LED lights, and …
  - TC4.2: Dru: new features on trending data coming from a research project. WDView can generate DD at any temperature base, and also generate binned data.
  - TC4.3: None reported
  - TC4.5: None reported
  - TC6.5: None reported
  - TC7.5: Wetter: how to create models to be put into actual use. Sonderegger: one subcommittees is working on "virtual sensors", and an RTAR on reducing simultaneous heating and cooling in buildings. Haves: TC7.5 expanded its tasks to Innovative controls for high-performance buildings.
  - TC7.6: None reported
  - BuildingSMART: None reported
  - IBPSA: WORLD: France: extended the deadline two more weeks. USA met on Saturday and elected a new board of directors. SIMBUILD 2012 in August in Madison with good papers now posted on the website. Thinking of hiring an executive director because of the workload involved. A student scholarship program is now available.
  - BPI: Balbach: standard went to ANSI (performance-base tax credit for whole house performance) it recognizes Guideline 14.
  - Guideline 14: Haberl: met Sunady and a public review draft. 57 comments were received from 2 members. A final document will go to ASHRAE in a month.
  - COMNet: Their focus has shifted; we may not be interested in their scope anymore.

ASHRAE TC 4.7 Energy Calculations (page 4 of 4)
Tuesday, JANURAY 29, 2013, 6:00-8:30 p.m.
Dallas

Minutes (continued)

- Old Business: None reported.
- New Business: Chip: A moment of silence to remember Kurt Peterson who died last July.
- Executive Session:
- A motion to adjourn passed at 7:50pm.

Attachments

A. Agenda
B. Simulations and Component Models Subcommittee Minutes
C. Data-Driven Models Subcommittee Agenda and Minutes
D. Applications Agenda and Minutes
E. Handbook Subcommittee Minutes
F. Program Plan

Note: SSPC 140 Agenda and Minutes were not received by the TC Secretary.

Attachment A

Agenda
ASHRAE TC 4.7 Energy Calculations – Main Meeting
Tuesday, January 29, 2013, 6:00-8:30 pm

1. Roll call and introductions	Abushakra
2. Accept agenda & approve minutes of previous meeting	McDowell
3. Announcements/Liaisons	McDowell
4. Membership	McDowell
5. Subcommittee reports	
5.1 Applications	Huang
5.2 Data-Driven Modeling	Abushakra
5.3 Simulation and Component Models	Crawley
5.4 Research	Haberl

Research Projects/Work Statements

- Status: 1413-RP Missing weather data (co-sponsored with TC 4.2) – underway (underway Univ. of Okla).
- Status: 1468-RP BIM to thermal modeling (co-sponsored with TC 1.5) – should be finishing at Dallas
- Status: 1588-WS Procedure to create hypothetical layer-by-layer fenestration descriptions when only the bulk properties such as U-Factor and SHGC have been defined (approved).

RTARs, Requests for Co-sponsorship

- Status: RTAR 1161 Modelica Models for the Evaluation of Supervisory Control Strategies in the ASHRAE Handbook (sent back to Authors) - SCM
- Status: RTAR of Smart Meters (sent to Mike Vaughn after vote) - DDM
- Status: RTAR of Actual Performance of Buildings (Haves) – APP
- Status: 1456 RTAR Natural Ventilation Phase II – SCM
- Status: RTAR Uncertainty – SCM
- Status: RTAR Adapt DOE Reference Buildings for ASHRAE Use – APP
- Requests for co-sponsorship

Attachment A (continued page 2 of 2)

Agenda
ASHRAE TC 4.7 Energy Calculations – Main Meeting
Tuesday, January 29, 2013, 6:00-8:30 pm

5.5 Handbook	Barnaby
5.6 Program	Balbach
5.7 Standards	Neymark
• SSPC 140 SMOT for Eval Bldg Energy Analysis Computer Programs (Judkoff)	
• SPC 205 – Std. Repr. of Perf. Data for HVAC&R Eq. & Other Fac'l Eq.(Barnaby)	
• SGPC 20 Documenting HVAC&R Work Process and Data Exchange Requirements (Long)	
• New Standard 209P "Energy Simulation Aided Design for High Performance Buildings" (Glazer)	
5.8 Web Site	Kinney
6. Related activities reports	
• Water Standard 191P	Haberl
• MTG.EAS Energy Eff AHU Systems	Haberl
• TC 2.8 Building Environmental Impacts and Sustainability	
• TC 4.1 Load Calculation Data and Procedures	Fisher
• TC 4.2 Climate Information	Degelman
• TC 4.3 Infiltration & Ventilation Requirements	MacDonald
• TC 4.5 Fenestration	Barnaby
• TC 6.5 Radiant Heating and Cooling	Sommer
• TC 7.5 Smart Building Systems (now includes TC 7.4)	Wetter
• TC 7.6 Building Energy Performance	Abushakra
• BuildingSMART (formerly IAI International Alliance for Interoperability)	Haves
• IBPSA: USA, Canada, World	Wetter, Hensen
• BPI-2400-2-2011 Standardization Qualification of Whole-house Energy Savings Est.	Balbach
• Potential for open source simulation (DOE-2)	Huang
• Guideline 14	Haberl
• COMNet	Eley
7. Old Business	McDowell
8. New business	McDowell
9. Executive Session	McDowell
10. Adjourn	McDowell

Attachment B

TC 4.07: Simulation and Component Models Subcommittee

Agenda (not submitted)

Attendance

Name	Affiliation	E-mail (deleted)
Kee Han Kim	TAMU	
Minjae Shin	TAMU	
Sung Lok Do	TAMU	
Mahabir Bhandari	ORNL	
Craig Wray	LBNL	
Phil Haves	LBNL	
Mark Hydeman	Taylor Engineering	
Sukjoon Oh	TAMU	
Paul Lebbin	CNRC	
Kris Kinney	KW-Graph	
Dvid Bosworth	Weston Solutions	
Bruno Lee	TU Eindhoven	
Kris Xu	Southland Industries	
Marija Trcka	UTRC	
Russel Taylor	UTRC	
Dru Crawley	Bentley Systems	
Simon Rees	De Montfort University	
Don Shirey	Bentley Systems	
Steve Snyder	JCI	
James McNeill	AEI Engineers	
Piljae Im	ORNL	
Scott Hackel	Energy Center of Wisconsin	
Chip Barnaby	Wrightsoft	
Tim McDowell	TESS	
Jeff Haberl	TAMU	
Agami Reddy	ASU	
Amir Roth	DOE/EERE	
Michael Wetter	LBNL	
Dan Fisher	OSU	
Ery Djunaedy	University of Idaho	
Wangda Zuo	LBNL	
Chris Balbach	Performance Systems Development	
Keith Cockerham	DLB Associates	
Bass Abushakra	MSOE	
Joe Huang	White Box Technologies	
Erik Kolderup	Kolderup Consulting	

Attachment B (continued page 2 of 3)
(TC 4.7 Simulation and Component Models Subcommittee)

Minutes

- 6:03 Dru started the meeting with Introductions.
- WS from SPC 90.4, TC9.9 (Mission Critical Facilities) was discussed, Energy for Data Centers including components performance, and equipments included in Data Centers (PDU, STS, etc.) that need to be modeled to determine their energy consumption. There's a need for a software capable of performing these simulations. An RTAR was skipped, and a WS, agreed upon by ASHRAE, was drafted. The industry is looking for a tool that is easy to use. Who could eventually bid on this project? TC4.7 is asked to co-sponsor the project, and help with the brainstorming and participate in the PMSC. TRANE-TRACE and spreadsheets were actually used to do some required calculations. An RP can create "templates" as a result for users who need to develop models for Data Centers (conditions: 115F, 1,000-10,000 W/ft^2).
- Mark Hydeman, LBNL, noted that data centers are difficult to model because multiple systems serve a single zone, due to the variety of equipment that are included in a single space. Dynamics inside the servers are not modeled.
- Michael Wetter, LBNL, noted that the RP should not be specific in terms of what software should be used (for instance, to become an addition to EnergyPlus, etc.).
- Dru asked for a discussion on Program: Keith Cockerham talked the upcoming conference in Denver and NY.
- Jeff Haberl proposed having a Forum in Denver on Data Centers.
- NY Technical Papers are due in April 19. Abstracts are due March 15 2013.
- Dru asked to discuss Research.
- J. Haberl started by summarizing the research project recently completed recently in TC4.7.
    - RTAR 1661 was previously rejected, and it will be revised and resubmitted after implementing the RAC comments.
    - RTAR 1676 was previously rejected, and it will be revised resubmitted after implementing the RAC comments.
    - RTAR 1404 was approved by full committee and still need some paperwork to be completed.
    - TRP 1588 ready to go out for bidding.
    - RP 1468 was completed in August 2012, and final report was approved by the PMSC. Final report is expected in Spring 2013.
    - RP 1413 work is underway. Expected completion in June 2013.
- Joe Hoang noted that RP1456 follow-on project, should be reconsidered (it's not on the RAC list anymore). An RTAR will be developed before Denver's meeting.
- Dan Fisher: WS 1629 was approved for co-sponsoring by TC4.7, underwent a change today, and the change is on the "test matrix", and level of effort was raised to $150K from $100K.
- Agami Reddy: Asked that the authors of WS 1629 need to make sure they address the comments of RAC. TC5.3 is going to approve it Tuesday, Jan 29.
- Dru asked to move on to other WS and RTAR's based on the San Antonio discussions.
- Dru asked to discussed New Research! (with 35 minutes to go).
- Phil Haves talked about the mechanisms to continue the work on the RP1456 follow-on work. Joe Hoang noted that the work would require multi-zone modeling skills.
- Craig Wray talked about the importance of the work that comes out of this follow-on project, and that thermal, comfort and air flow modeling would be required. What pieces of simulation models are missing?
- Phil Haves: The motivation is to figure out what capabilities new models should have!
- Using CFD can be used in this project efficiently (for instance, responding second by second to solar radiation, and can be coupling with multi-zone models (a researcher from Florida).
- Mark Hydeman talked about the complexity of performing thermal and comfort modeling at the at the same time. The Golden Gate chapter of ASHRAE sponsored a competition on modeling a building with chilled beams, and discussed how to get some trim-controls efficiently to bring the energy consumption down.
- Craig Wray: in the next month there's going to be a webinar on air flow modeling.

Attachment B (continued page 3 of 3)
(TC 4.7 Simulation and Component Models Subcommittee)

Minutes (continued)

- Phil Haves: A general problem of large spaces that have different equipment and conditions are hard to model, and need methods that are transparent to the users.
- Joe Hoang: Atrium modeling remains tricky.
- Craig Wray: a seminar followed by a forum can be prepared to discuss the above.
- Dru adjourned that meeting at 6:30pm.

Attachment C
TC 4.07 Data Driven Modeling Subcommittee
Monday, January 28 2013
7:30-9:00pm
Lone Star Ballroom, C3
Dallas, TX
Chair: Chris Balbach

Note: Brief notes for the meeting (minutes) are listed at the end of the agenda.

Agenda

1. Introductions (5 minutes)
2. Approval of the minutes of the meeting in San Antonio, June 2012 ((5 minutes)

TC 4.7 Sponsored Technical Sessions (5 minutes)

- *Technical Paper Session 2*
  - Advanced Building Modeling – Sunday 1:30-3:00 (Dallas A2)
- *Seminar 32*
  - Data Visualization 101 - Monday 11:00-12:00 (Lone Star A4)
- *Seminar 56*
  - Calibration Case Studies, Fleets of Buildings, Individual Building and Algorithm - Wednesday 8:00-9:30 (Lone Star A3)
- *Technical Paper Session 9*
  - Predictive Modeling and Simulation of Novel HVAC Design - Wednesday 11:00-12:30 – (Dallas A3)

3. Discussion of Program (15 minutes)
   a. Annual Conference 2013 (Denver)
      - Technical Paper Session:
      - "Predicting Annual energy Use in Buildings Using Short-term Monitoring: The Daily Hybrid Multivariate Change-point Inverse Model (RP-1404)".
      - "Predicting Annual Energy Use in Buildings Using Short-Term Monitoring: The Dry Bulb Temperature Analysis (DBTA) Method".
      - Note: 3 more papers from RP-1404 are in progress for submittal to ASHRAE.
   b. Winter Conference 2014 (New York)
   c. Beyond.

4. Demo on ECAM (Energy Charting And Metrics), Bill Koran (15 minutes)

5. Discussion of WS and RTAR's (30 minutes)
   d. Existing WS and RTAR's
   e. Ideas for new RTAR's
   RTAR's need to be aligned with the ASHRAE Research Strategic plan for 2010-2015 (attached, below).
      - Ideas previously discussed:
        1. AI for data-driven modeling
        2. In-situ procedures for energy savings from renewable projects
        3. In-situ procedures for actual energy performance of LEED-Certified buildings *(Draft RTAR)*
        4. Electricity demand savings

Attachment C (page 2 of 4)
TC 4.07 Data Driven Modeling Subcommittee

Agenda (continued)

5. Water use in a facility
6. Data-driven Building Models for Smart Meters *(RTAR rejected in 2012. Should it be revived with RAC comments?)*
7. Standardized M&V for savings from operational changes

- New ideas.

6. Discussion (5 minutes)
   - Better ways to digest past research
   - Disseminate research results
   - Coordinate research and results with allied TC and SC (co-sponsoring RTAR's)
   - Participate in newly-formed "Multi-disciplinary Task Groups (MTG's)
   - Maintain expertise within SC even when membership changes.
7. Old Business (5 minutes)
8. New Business (5 minutes)
9. Adjourn

Some Background Information:
Review of ASHRAE Strategic Plan for Research:

- Research themes include:
  1) Energy and Resources,
  2) Indoor Air Quality,
  3) Tools and Applications, and
  4) Equipment, Components and Materials
- Weighted criteria:
  1) Supports strategic plan 45%,
  2) co-funding support 10%,
  3) anticipated application 10%,
  5) RAC vote 20%, and
  6) Tech Council Preview Feedback 5%
- RAC will review RTARs at all meetings: 3/yr –need 45 days advance – May 15, Aug 15, Dec 15
- Limited time for RTARs in Implementation Plan (4 meeting shelf life); intended to minimize delays in initiating research projects

ASHRAE Research Strategic Plan – 2010-2015

Goal 1 Maximize the actual operational energy performance of buildings and facilities.

Goal 2 Progress toward Advanced Energy Design Guides (AEDG) and cost-effective net-zero-energy (NZE) buildings.

Goal 3 To reduce significantly the energy consumption for HVAC&R, water heating and lighting in existing homes.

Goal 4 Significantly advance our understanding of the impact of indoor environmental quality (IEQ) on work performance, health symptoms and perceived environmental quality in offices, providing a basis for improvements in ASHRAE standards, guidelines, HVAC&R designs and operation practices.

Goal 5 Support the development of ASHRAE energy standards and reduce effort required to demonstrate compliance.

Attachment C (page 3 of 4)
TC 4.07 Data Driven Modeling Subcommittee

Agenda (continued)

Goal 6 Building Information Modeling of energy efficient, high performing buildings. BIM is a rapidly developing field of knowledge which stretches beyond the traditional boundaries of the HVAC&R industry to the wider construction sector.

Goal 7 Support development of tools, procedures and methods suitable for designing low-energy buildings.

Goal 8 Facilitate the use of natural and low global warming potential (GWP) synthetic refrigerants and seek methods to reduce their charge.

Goal 9 Support the development of improved HVAC&R components ranging from residential through commercial to provide improved system efficiency, affordability, reliability and safety.

Goal 10 Significantly increase the understanding of energy efficiency, environmental quality and the design of buildings in engineering and architectural education.

Goal 11 Understand influences of HVAC&R on airborne pathogen transmission in public spaces and develop effective control strategies.

Minutes

Notes from the meeting, under the discussion for new ideas for RTAR's:

- PNNL is responsible for ECAM (not a formal ownership and control).
- Purpose of RP1050 was to make it available to the industry.
- An addition to RP1050 in ECAM is the 5 and 6 parameters, and 2nd degree and 3rd degree polynomials.
- Forensic data investigation? Like in accounting and taxes? (tax fraud)
- A new RTAR should be written to update the IMT! (6 parameters, 2nd degree polynomials, etc., figuring out method to find the average outdoor temperature znd degree-days for variable billing periods, converting it form FORTRAN to something better, Inverse-Bin model, etc.).

New mandatory energy consumption data publishing, and its quality issues (like in Europe). Information about the specific building should be available.

Attachment C (page 4 of 4)
TC 4.07 Data Driven Modeling Subcommittee

Attendance
Not provided to the Secretary

Attachment D

TC 4.7 Applications Subcommittee
Monday, January 29, 2013
3:30-5:00pm
Lone Star Ballroom, C4
Dallas, TX

Agenda

1) Introductions and Agenda Review (5 minutes)
2) Program (15 minutes) (Chris Balbach)
    a. 2013 Winter (Dallas)
    b. 2013 Summer (Denver)
    c. 2014 Winter (
    d. Beyond
3) Research (65 minutes)
    a. Existing Work Statements (5 minutes)
        - 1588-WS Representative Layer-by-Layer Descriptions for Fenestration Systems with Specified Bulk Properties such as U-Factor and SHGC (co-sponsored by TC 4.5) (Joe Huang). Final approval November 2012, to be out for bid Spring 2013.
    b. Ideas for new RTARS or other research activities (15 minutes each)
        - Update on TC 4.7 involvement in the review of COMNET and other COMNET-related activities (Ellen Franconi if available).
        - Update on Hi-Performance Buildings TPS (Jason Glazer, if available)
        - Actual Performance of Buildings (Phil Haves) (original topic "reconciling differences in computer simulation results to actual energy usage of LEED-certified buildings").
        - Should TC 4.7 maintain a set of prototypical building models and input files, possibly building on DOE's "Reference Building Models"? (Joe Huang)
        - Using building energy simulations for HVAC design calculations (Joe)
4) Any other ideas and burning issues (time permitting) (5 minutes)

Attachment D (page 2 of 5)
TC 4.7 Applications Subcommittee

Minutes

- J. Huang started the meeting at 3:35 PM.
- Copies of the agenda were passed out.
- Introductions were then made.
- E.Franconi asked for time to introduce the BEM work and BEM library she is working on.
- J.Huang then moved on to program.
- K.Cochran then reviewed the program for San Antonio, Dallas, Denver and beyond, including dates for submission.
- Program was also reviewed from SCE and DDM, including the modeling seminar that W.Zhou had recommended, the data visualization seminar from DDM.
- E.Franconi suggested a forum on COMNet
- There are several states that want to automate the baseline calculation. IBPSA has reviewed COMNet…and found that there are issues with it being used for baseline generation. Therefore, there is a need for a more rigorous review of COMNet.
- It was also suggested that Standard 209 may be a topic for a forum in Dallas.
- Discussion then moved on to Research.
- WS 1588 was then reviewed.
- J.Huang said that this was recently approved.
- P.Haves gave the subcommittee an update on RAC. The general issue is that there are lots of different people on RAC with varying backgrounds. Therefore, they don't always understand what's being presented in the RTAR. Therefore, there need to be a clear justification as to why the RTAR is needed.
- J.Huang reviewed the history of the WS.
- Discussion then moved on to COMNet. E.Franconi and R.Nelson presented a brief presentation for the subcommittee.
- Initially COMNet was created to automate the modeling for different baseline techniques: federal tax, green building, energy rating, code compliance.
- ECB has now picked-up some of the modeling procedures from COMNet.
- COMNet has also proposed a standard file output for simulation for XML.
- COMNet now has a "portal" for submitting simulation files.
- CEC is also working on a "rules base" for use with simulation.
- E.Franconi reminded the subcommittee that IBPSA had reviewed COMNet when it first came out. To accomplish this C.Eley created a presentation, that was recorded, and reviewed COMNet.
- IBPSA reviewed COMNet and noted their concerns in a letter to C.Eley.
- E.Franconi mentioned that the CEC was very much interested in COMNet for review.
- J.Haberl expressed concern about the use of another "layer" when simulating code compliance. Who was going to maintain this? What's the business model for COMNet? Will there be a fee over time for using it?
- R.Nelson said that COMNet was not supposed to be another "layer", but rather an automated platform.
- Questions were raised about what a forum could do to help get the word out.
- J.Glazier mentioned that COMNet has too much detail to allow it to become part of 90.1…there is already 14 pages in the ECB guideline and going to 100s of pages seems to be quite a task.
- J.Haberl spoke in favor of a forum for discussing COMNet.
-

Attachment D (page 3 of 5)
TC 4.7 Applications Subcommittee

Minutes (continued)

- P. Haves was concerned that he has now heard this several times, but was still trying to understand the issue…therefore there's more needed than just a Forum…probably something on the order of a Seminar/Forum.
- T.McDowell said that Forums are usually there for people to come and learn something. Therefore, he was concerned that any such forum would just be folks coming in to complain about COMNet. Therefore, he suggested a Seminar presentation. The issue is that nobody has implemented COMNet's rules in software yet.
- P.Haves said that someone needs to demonstrate how it works, why it works, and how it is intended to be adopted.
- E.Franconi expressed concern that this needs to be discussed. If someone like USGBC adopts it, then what. Hence the need for the public vetting.
- P.Haves said the point of presenting it was, can it be presented in ½ hour or 1 hour…in such a way that everyone can see what's in it.
- E.Holderup said that he was concerned that 4.7 does not have a way to go forward with this if it can't be a seminar, forum or RTAR.
- J.Haberl reminded the committee that ASHRAE should not be supporting a private effort and therefore, TC 4.7 should not be supporting a forum or seminar on COMnet.
- J.Huang said that he needed to close the discussion on COMNet.
- Discussion then moved on to Standard 209
- J.Glazier reviewed Standard 209 with the subcommittee.
- A call for members went out before Chicago. 49 applications were made and a recommendation for 29 members and the rest to be non-voting members.
- At the meeting today, things were treated as an informal meeting.
- First draft is for January 2014. Publication for June 2015.
- A framework for the document has been created. 5 subcommittees have been created, with one on resources, definitions, references, etc.
- There is a need for liaisons, including TC 4.7.
- Standard 209 is considering having a meeting at the IBPSA meeting, in addition to conference calls, etc.
- Discussion then moved to the previous items from Chicago.
- P.Haves spoke to the issue on reconciling differences in computer simulation results to actual usage of LEED certified buildings.
- P.Haves said that there was a call, but not much progress made since then.
- He anticipated that there would be progress in the near future.
- Discussion the moved to the idea of TC 4.7 having prototypical building files for use by anyone.
- J.Huang reviewed the idea to use the reference buildings that DOE has created through NREL, LBNL and PNNL.
- The idea would be for ASHRAE to get involved in this through TC 4.7.
- J.Huang did show this to C.Wray on the MTG.EAS and he thought this would be a good idea.
- J.Glazier said that this sounded like a good idea. He reminded the committee that the 2010 User's manual included some sample files, although they had not been completely vetted. The challenge is what software do you want to support with this…since one definition does not fit all software.
- J.Huang said that the current reference buildings are in EnergyPlus, but that this needed to be opened up to other platforms.
-

Attachment D (page 4 of 5)
TC 4.7 Applications Subcommittee

Minutes (continued)

- P.Haves was still wondering what the purpose for this was? There was already some confusion of the difference between the PNNL and LBNL versions of the sample files, and was wondering how that would be resolved.
- J.Huang said that the main purpose was to have agree-upon prototypical buildings. That there would be multiple uses for this.
- Z.Cumali said what was necessary was a standard way of describing a building energy input file.
- Meeting was adjourned at 5:05 PM

- Discussion on program, started by Keith Cockerham, asking for abstracts for technical and conference papers.
- Joe asked for a discussion on Research: WS1588 was finally approved and will be scheduled for bidding (RFP) this Spring. He talked about the importance of the work to be done in this project.
- Ideas for new RTAR's :
    - COMNET: there's been a series of workshop and webinars.
- Tim McDowell: Guidance should be provided to people doing energy modeling and developing baselines, rather than simply discussing COMNET.
- K. Haddad: may be interested in developing a Seminar on COMNET and specific simulation program does the baselines (rule-based system that can be implemented in software). Also automating BIM to Thermal models.
- A new Standard 209 championed by J. Glazer is still under development.
- A year ago we started a discussion on DOE reference buildings, and whether ASHRAE should be the caretaker of these reference building models (TC4.7 to be more active than just a user).
- Judkoff noted that NREL does not have a funding source to take over this task of maintaining and developing these files to cover more building types along with some other modeling features. It can be done like a building component library at a national lab.
- An Open-source environment might be the solution (K. Haddad).
- The chair can write a letter to ASHRAE to push for the importance of adopting these input files and maintain them.
- Judkoff proposed a motion to take this to the full TC, so that T. McDowell can write a letter. Motion passed unanimously.
- Phil Haves is still working on the RTAR to reconcile differences in computer simulation results to actual energy usage of LEED-certified buildings. The RTAR should be ready in Denver.
- Joe: "Using energy simulation for HVAC design calculations"
- T. McDowell: the equipment selection based on peak loads.
- J. Huang: Annual simulations to assess the validity of design calculations. Equipment sizing is rather done based on design days and even going for the higher size in equipment for liability issues for PE's.
- B. Abushakra noted that the main point is to figure out why the actual annual performance shows different peak days than those predicted by the simple design calculations (equipment sizing based on peak weather conditions on design days).
- Eric would work on organizing a seminar on this topic.
- Meeting was adjourned at 4:53pm.

Attachment D (page 5 of 5)

TC 4.7 Applications Subcommittee

Attendance List

Not submitted

Attachment E
ASHRAE TC 4.7 Energy Calculations
Handbook Subcommittee
Tuesday, January 29, 2013, 5:00 – 6:00 PM
Dallas, TX
Minutes

Attendance

Who	*Affiliation*	*eMail*
Ron Judkoff	NREL	Ron.judkoff@nrel.gov
Tim McDowell	TESS	mcdowell@tess-inc.com
Jeff Haberl	TAMU	jhaberl@tamu.edu
Joel Neymark	JNA	neymarkj@msn.com
John Pruett	ZMM	jap@zmm.com
Erik Kolderup	Kolderup Consulting	erik@kolderupconsulting.com
Chip Barnaby	Wrightsoft	cbarnaby@wrightsoft.com
Russ Taylor	UTRC	taylorrd@utrc.utc.com

The revised 2013 chapter manuscript was submitted to ASHRAE in early December 2012.
The group discussed how to divide up the expected galley review process for the 2013 chapter. Several people volunteered to work with Kolderup and Barnaby, see Action Items below.
The discussion turned to lessons learned from the 2013 process. This led to preliminary planning for the 2017 chapter. Kolderup will work with Neymark and others to begin formulating the next edition of the chapter. McDowell urged getting started early, so the plan is to have some ideas together by Denver.
Thoughts included improved coverage of –

- Next generation modeling methods
- Methods and procedures

Alternatives to MS Word for editing and tracking comments will be explored to allow to collaborative development.
Barnaby provided Kolderup with copies of all files related to 2013 chapter development.

Action Items

Who	*What*	*When*
Barnaby Kolderup Judkoff Neymark Haberl students	Review galleys	As needed by ASHRAE
Kolderup Neymark	Assemble list of possible chapter improvements. Prioritize ideas. Begin to identify possible contributors for revised and added sections. Develop list of milestones and completion dates.	June, 2013 Denver

Attachment F
TC 4.7 Program Plan

Note: Below is the attachment included in the San Antonio, June 2012 Minutes, since the Program Plan from the Dallas, January 2013 Meeting were not provided to the Secretary.

January 21- 25, 2012, Chicago IL Theme: N/A!

TC 4.7 SPONSORED PROGRAMS PRESENTED AT CHICAGO:

MONDAY: SEMINAR 18: Standard 205P: Hassle-Free Equipment Performance Data for Energy Modeling
Chair: Chris Balbach, P.E. Speakers: Charles S. Barnaby, Mark Hydeman, P.E., Neal Kruis,
Attendance:

MONDAY - SEMINAR 28: Improving Energy Modeling Consistency
Chair: Joe Huang, Speakers: Erik Kolderup, P.E., Thomas White, P.E., Ellen Franconi,
Attendance:

WEDNESDAY - SEMINAR 44: I Integrated Multi-Domain Simulations for Innovative Building Design and Operation, Part 1
Chair: Wangda Zuo, Ph.D., Speakers: Jan Hensen, Ph.D., John Zhai, Ph.D., Ian Beausoleil-Morrison, Ph.D
Attendance:

WEDNESDAY SEMINAR 53: Integrated Multi-Domain Simulations for Innovative Building Design and Operation, Part 2
Chair: Jerone Matthew Gagliano, P.E. Speakers: Michael Wetter, Ph.D., Wangda Zuo, Ph.D., Yao-Jung Wen, Christophe Von Treeck/Sebastian Stratbucker
Attendance:

ASHRAE High Performance Buildings Conference - A Focus on Deep Energy Savings
March 12-13, 2012, San Diego, CA
Call for Posters due February 3rd

Energy Modeling Conference: Tools for Designing High Performance Buildings
October 01 - 03, 2012 Atlanta, GA, USA
Abstracts due: 2/15/12, **Decisions**: 3/15/12 **Accepted speaker forms due**: 4/15/12 **Presentations due**: 9/1/12
Conference: 10/12

Next ASHRAE Meeting: June 23 - 27 2012 / San Antonio TX WEBSITE (http://ashraem.confex.com/ashraem/s12/cfp.cgi) OPEN

Track 1 HVAC&R Systems & Equipment
Track 2 HVAC&R Fundamentals and Applications
Track 3 Integrated Energy Systems
Track 4 Building Modeling Applications
Track Chair: Pam Androff Email: pamela.androff@gmail.com
In our modern times, building design almost always demands some version of modeling, but the debate continues as to what is the most effective method to simulate various building systems. The stakes are especially high for building

designs that require validation in effectiveness prior to installation. This track seeks papers and programs that focus on understanding, manipulating, and optimizing building design choices via modeling.

The programs will cover modeling fundamentals, building component contributions, system right-sizing, 3-D computer simulation advantages, and advanced energy modeling techniques

Attachment F
TC 4.7 Program Plan (continued, page 2 of 4)

Track 5 Refrigeration Applications
Track 6 Indoor Environmental Applications
Track 7 Integrated Building Controls

SAN ANTONIO PROGRAMS SCHEDULE:

February 13	Seminar, Forum, TPS and CPS Program Proposals Due
February 13	Technical Papers Final Reviews
March 7	Final Technical Papers Due
March 9	Revised Conference Papers Due
March 16	Notifications of Seminar and Forum Accept/Reject Distributed
March 30	Conference Papers Accept/Reject Notifications
April 5	Final Conference Papers Due
May 4	Upload of PPTs Begin
June 4	All PPTs Due Online
June 23	Speaker's Lounge Opens

POTENTIAL SEMINAR SUBMISSIONS FOR SAN ANTONIO

SEMINAR # 1 CHAIR: (Chip Barnaby / Neal Kruis) TITLE – 3 perspectives on SPC 205P (Chip)

3 speakers who would be a consumer of 205P, and product manufacturer complying w/ 205P and a software vendor working w/ 205P data

SEMINAR #2 CHAIR Keith Cockerman –"Calibration 102" – follow-up to seminar 28

Joe Huang- Fred Bauman (Simulation calibration of New York Times) New case studies of calibration

SEMINAR #3 CHAIR – CHRIS BAKER (WEIDT GROUP) –Topic - Calibration? Follow up on

White Box (Joe Huang) RE: differences between different programs for same process AtticSim coupling w/ DOE-2 vs EnergyPlus;
Weidt Group on 10 school model calibrations;
Speaker from Group 14 (Sue Reilly) RE: Informed energy audits for MF;
Speaker from NREL (Ron Judkoff?) RE: BESTEST-EX

SEMINAR #4 CHAIR – DAVE BOSWORTH TITLE: Using measured data of various fidelity with simulations

Speaker from NREL (Eric Bonnema) RE: AEDG – use of building profiles (schedules, to inform modeling;
Speaker from NREL (Jesse Dean) RE: NREL RSF - Generating fully articulated models from building sub-metered data);
Speaker TES (Tim McDowell) RE: How to calibrate and what can be learned when very detailed measured data of system output of a collection of components (flow rate, temp, pressure) are available (how to we take that data and match it to a theoretical model and extract value).

SEMINAR #5 CHAIR – CHRIS BALBACH TITLE: "Method for Quantifying Water savings using Regression Models"

Speaker 1 (Chris Balbach) - Can reliable baseline regressions be determined (across different geography) using monthly bills and average monthly dry bulb (or another variable) across the country? (need 5 - 7 different locations and a decent 12month data set for each bldg). Quantifying CV-RMSE-> Uncertainty to say whether or not (2) is valuable;
Speaker 2 (Jerone) - Determining Water Savings associated w/ a specific project Pick one building where a prediction of savings was made. Determine pre, post and predicted and evaluate uncertainty, etc. Do we have a property where Can we get it for ONE bldg;

Attachment F
TC 4.7 Program Plan (continued, page 3 of 4)

Speaker 3 – (Jeff Haberl) - "How to convert predicted savings to societal energy savings" (JEFF HABERL will present this). This is going to be dependent on details for each muni water system, etc)

Other ideas from prior TC 4.7 subcommittee meetings?

1) TC4.7 (Simulation and Component Models) Seminar Chair: Joe Huang:
Topic Reasons or Causes for Uncertainty in Building Energy Simulation
Speakers: Ian, NREL, Jan Hansen

2) TC4.7 (Applications) Seminar Chair: Chair Needed (Tim McDowell) EK – submit & Fail…
Topic Building Simulation 104 Analysis of uncertainty….Uncertainty validation and calibration input uncertainty, output uncertainty of the result…
Speakers Phil Haves, Nick Long, Ron Judkoff

3) TC4.7 (Data Driven Models) Seminar Chair: Bill Koran
Topic UNCERTAINTY Technical
Speakers TBD

Code-Compliance — Scheduled
Organized by: TC 4.7 (Applications)
Chair: Larry Degelmann
Status: Moved from Dallas. (Jeff Haberl, Eric Richmond, Paul Mathew).

Seminar "How to Assess the Performance of Sustainable Buildings" — Scheduled
Organized by: TC 4.7 (Data Driven Models)
Chair: Moncef Krarti
Status: 4 speakers (B. Koran, Bass Abushakra, David Claridge)

Seminar "Computer Simulation of Supermarkets" — Not scheduled
Organized by: TC 10.7 (co-sponsored by 4.7)
Chair: Van D. Baxter, ORNL
Status: Since 7/09. Has 4 speakers

Transaction "Use of 'equation solvers' for Simulation"
Organized by: TC 4.7 (Data Driven Models)
Co-Chair: Jean Lebrun/Michael Wetter
Status: Have 1 paper (Lebrun), need one more paper.

Forum "Should ASHRAE Develop a Standard for Simulation Aided Design of High Performance Buildings"
Track: Sustainability/LEED
Organized by: TC 4.7 (Applications)
Chair: Jason Glazer
Status: Since 6/08

Conference Paper "Use of Building Energy Simulation in Energy Code and Policy Analysis"
Organized by: TC 4.7
Chair: Russ Taylor
Status: Since 1/09. 3 speakers (R. Taylor, R. Brahme, K. Otto)

Attachment F
TC 4.7 Program Plan (continued, page 4 of 4)

Seminar "Simulation Support for the Solar Decathlon"
Track: Applications
Organized by: TC 4.7 (Applications)
Chair: Kamel Haddad
Status: Since 6/07. Has speakers.

Seminar "Shoot-out of Code Compliance Simulation for Residential Buildings"
Organized by TC 4.7 (Applications)
Chair: Jeff Haberl

Seminar "Simulation of HVAC/R equipment and systems using the limited data published by manufacturer"
Track: Systems and Equipment
Organized by: TC 4.7 (Simulation and Component Models)
Chair: Michael Wetter
Status: Since 6/08. Joel Neymark, Vincent Lemort, Stephane Bertagnolio & Jean Lebrun, Craig Wray.

Seminar "You don't know what you've got 'till it's checked! The importance of QA in benchmarking energy analysis results"
Organized by: TC 4.7 (Simulation and Component Models)
Chair: Russ Taylor
Status: Since 1/08. Had two speakers (summer 09).