

**AMERICAN SOCIETY OF HEATING, REFRIGERATING 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 7.5 DATE: First draft ---August 15, 2013, Final 1/21/2014

TC/TG/TRG TITLE: Smart Building Systems

DATE OF MEETING: June 25, 2013 LOCATION: Denver, CO

Members Present	Appt	Members Absent	Appt	E-Officio Members and Additional Attendance
Carol Lomonaco, Chair, (V)	2013	Meli Stylianou, (V)	2016	Kevin Christman
Zheng O'Neill (V)	2014	Natascha Milesi Ferretti, Vice-Chair, Research Subc. (NV)		Kyle Hasenkox
Michael Brambley, Handbook Subc., (NV)	2008	Shengwei Wang, Member Non-Quorum (V)		Bing Dong
Carlos Haiad, (V)	2015	Li Song, Building Operations Dynamics Subc		Sam Jasinski
Rich Hackner, Secretary, (NV)		Robert Sonderegger, (V)	2015	Daihong Yu
Steve Blanc (V)	2015	Mike Galler, Webmaster (NV)		Greg Pavlak
Xiaohui Zhou, Program Subc. (V)	2013	Adrienne Thomle, Section 7 Head		Tom Lawrence
Krishnan Gowri, Smart Grid Subc., (NV)	2013			Xin Sherry Hu
Yuebin Yu Fault Detection and Diagnostics Subc., (NV)				Gary Shamshoian

Members Present	Appt	Members Absent	Appt	E-Officio Members and Additional Attendance
William Healy, Secretary, Wireless Subc. (NV)				
Corresponding Members Present		Corresponding Members Absent		Tania Ullah
Andrew Windham	2013	Glenn Remington, (CM)	2002	Ian Nelson
Allen Weidman, (PCM)	2011	Kristin Heinemeier, (CM)	2011	Anthony Florita
Chariti Young, (CM)	2002	Agami Reddy (CM)	2006	
David Bornside, (CM)	2004	Narendra Amarnani, (CM)	2004	
David Yuill, (PCM)	2010	Don Bailey, (CM)	2008	
Nick Gayeski, (PCM)	2011	Fred Bauman, (CM)	2009	
Ram Narayanamurthy, (CM)	2010	Christopher Benson, (CM)	2011	
Srinivas Katipamula, (CM)	2005	Michael Bobker, (CM)	2008	
Phil Haves (CM)		Marijn Braadbaart, (PCM)	2010	
Stephen Treado (CM)	2012	Michael Brandemuehl, (CM)	2007	
Dan Veronica, (CM)	2011	Dave Branson, (CM)	2001	
David Blum	2012	James Braun, (CM)	2007	
Edward Tsui	2013	Peng Xu, (CM)	2011	
Hashem Akbari	2013	Martha Brook, (CM)	2006	
Itzhak Maor	2012	James Butler, (CM)	2002	
Jerine Ahmed, (CM)	2007	Joon Ho Choi	2011	
Jin Wen, (CM)	2011	Brian Coffey, (CM)	2009	
Mayumi Miura	2013	Robert Coleman, (CM)	2008	
Peter Armstrong	2012	Maria Corsi, (CM)	2003	
Xiufeng Pang, (CM)	2011	Charles Culp, (CM)	2000	
Osman Ahmed, (CM)	2006	Arthur Dexter, (CM)	2005	
		Sharon Dinges, (CM)	2006	
		Piotr Domanski, (CM)	2005	
		Kirk Drees, (CM)	2008	
		Jay Eldridge, (PCM)	2011	
		Sukru Erisgen, (PCM)	2011	

Members Present	Appt	Members Absent	Appt	E-Officio Members and Additional Attendance
		Mohsen Farzad, (CM)	2005	
		Clifford Federspiel, (CM)	2006	
		James Gartner, (CM)	2007	
		Eunice Hameyie, (PCM)	2010	
		David Holmberg, (CM)	2011	
		Ahmad Husaundee, (CM)	2006	
		Mark Johnson, (CM)	2004	
		Ashok Kadakia, (CM)	2006	
		David Kahn, (CM)	1996	
		George Kelly, (CM)	2001	
		Michael Kintner-Meyer, (CM)	2007	
		Curtis Klaassen, (CM)	2008	
		Jan Kreider, (CM)	2008	
		James Kummer, (CM)	2008	
		Jean Lebrun, (CM)	2008	
		Scott LeClair, (CM)	2008	
		Kuei-Peng Lee, (CM)	2008	
		Hui Li, (CM)	2010	
		Mingsheng Liu, (CM)	2003	
		Darrell Massie, (CM)	2003	
		Peter May-Ostendorp, (PCM)	2010	
		John Mitchell, (CM)	2000	
		Shahid Naeem, (PCM)	2010	
		Ron Nelson, (CM)	1998	
		Richard Ng, (CM)	2008	
		Leslie Norford, (CM)	2006	
		Robert Old (CM)	2011	
		Hung Manh Pham, (CM)	2001	
		William Pienta, (CM)	2006	
		Kinga Porst, (CM)	2002	
		Michael Pouchak, (CM)	2003	
		Andrew Price, (CM)	2003	
		Barry Reardon, (CM)	1999	
		Jeffrey Schein, (CM)	2007	
		Russell Secor, (CM)	2008	
		John Seem, (CM)	2003	
		Dipak Shah, (PCM)	2010	
		Peter Simmonds, (CM)	2008	
		Vernon Smith, (CM)	2011	
		Pornsak Songkakul, (CM)	2002	
		Matthew Tyler, (CM)	2011	
		Arun Vohra, (CM)	2006	
		Paul Wacker, (CM)	2008	
		Josh Wall, (CM)	2011	
		Stuart Waterbury, (CM)	2011	
		Thomas Webster, (CM)	2009	
		Jonathan West, (CM)	2008	
		James Winston, (CM)	1996	

Members Present	Appt	Members Absent	Appt	E-Officio Members and Additional Attendance
		Jonathan Wright, (CM)	2008	
		Gene Strehelow, (CM)	2006	
		Shui Yuan, (PCM)	2009	
		Li Zhang, (CM)	2010	
		Barry Bridges, (CM)	2002	

(V) = voting member

(CM) = corresponding member

(PCM) = provisional corresponding member

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

DISTRIBUTION:

ALL MEMBERS AND CORRESPONDING MEMBERS OF TC/TG/TRG,

TAC CHAIR: Walter Grondzik

TAC SECTION HEAD: Adrienne Thomle

ALL COMMITTEE LIAISONS AS SHOWN ON TC/TG/TRG ROSTERS:

Research: Phil Haves

Standards: Rick Larson

CTT: Chad Moore

Special Publications: William Fleming

ALI/PDC.: Hugh McMillan

Staff Liaison (Stds): Stephanie Reiniche

Staff Liaison (Research/Tech Services): Michael Vaughn

DATE: June 25, 2013

TC NO. TC 7.5 TC TITLE: Smart Building Systems

CHAIR: Carol Lomonaco VICE CHAIR: Natascha Milesi Ferretti

TC Meeting Schedule

Location, past 12 mo.	Date	Location, planned next 12 mo.	Date
Dallas, TX	01/29/13	New York, NY	01/21/14
Denver, CO	06/22/13	Seattle, WA	06/30/14

TC Voting Member Status

1x	Carol Lomonaco(until 06/30/2013)	Yes
2x	Steve Blanc (until 06/30/2015)	Yes
3x	Xiaohui Zhou (Joe) (until 06/30/2013)	Yes
4x	Zheng O'Neill (from 07/01/2010 until 06/30/2014)	Yes
5x	Carlos Haiad (from 07/01/2011 until 06/30/2015)	Yes
6x	Robert Sonderegger (from 07/01/2011 until 06/30/2015)	Yes
7x	Meli Stylianou (from 07/01/2012 until 06/30/2016)	No

ASHRAE 2013 Summer Meeting – Denver, CO – June 22-27, 2013

Chair/Standards	Carol Lomonaco
Vice Chair/Research Subcom. Chair	Natascha (Castro) S. Milesi Ferretti
Secretary	Richard Hackner

ASHRAE 2013 Summer Meeting – Denver, CO – June 22-27, 2013

Research Subcom. Chair	Natascha (Castro) Milesi Ferretti (Carol acting for Natascha in Denver)
Handbook Subcom. Chair	Mike Brambley
Program Chair	Xiaohui Zhou (Joe)
Buildings Operations Dynamics Subcom. Chair	Steve Blanc
Smart Grid Subcom. Chair	Krishnan Gowri
Wireless Applications Subcom. Chair	Nick Gayeski
Fault Detection Diagnostics Subcom. Chair	Yuebin Yu
WebMaster	Mike Galler

ASHRAE TC 7.5: Smart Building Systems **DRAFT** Research Plan

Active RTARs:3?

Active WS:2

Subc	Project	RTAR Contributors	Status
FDD	WS-1615- FDD Methods for Supermarkets	Zheng O'Neill (Chair) Manrola(10.7) Daihong Yuebin Yu	-RTAR voted on at Louisville 6/2009 (9-0-1-CNV) 1615-RTAR approved 6/2010 in Albuquerque with RAC comments Draft WS ready for TC vote in Chicago 1/2012 TC approved (6-0-1-CNV) for submission to RAC 4/12 RAC returned with comments: <ul style="list-style-type: none"> Describe envisioned methodology Better define tasks Cite more existing researchers as qualified bidders New draft WS , version 7 ready. RAC Comments addressed and Sec. 7 Research Liaison comments addressed. Due for TC vote in Dallas- MUST BE SUBMITTED AND APPROVED FOR BID BY JULY 1, 2014 OR TOPIC WILL BE DROPPED PERMANENTLY.
SG	1543 RTAR Demand Response Optimization Protocol and Integrated Training	Rich Hackner (Chair) David Wilts David Ejadi	4/12 RTAR/WS was rejected by RAC. Extensive comments, would need a fresh rewrite and a new champion.
BOD	WS-Real-Time Optimal Control in a Distributed Environment.	Josh Wall	Original RTAR 2005-26 Review and approve in Orlando and vote in Orlando 2010 meeting. -Submit RTAR and WS simultaneously to RAC. Revised RTAR and revised Workstatement prepared for Chicago TC approved (6-0-1-CNV) for submission to RAC 4/12 RAC returned with comments: <ul style="list-style-type: none"> Describe major outcomes Obtain cofunding Better define task 3 Cite more qualified bidders Comments addressed and due for TC vote in Dallas- MUST BE SUBMITTED AND APPROVED FOR BID BY JULY 1, 2014 OR TOPIC WILL BE DROPPED PERMANENTLY.
FDD	RTAR-Reduce Simultaneous Heating and Cooling in Commercial Buildings	Zheng O'Neill Danny T.	-Voted in Louisville June 23, 2009 (9-0-0 CNV) -Re-submit to RAC at Orlando 2010 meeting. New draft RTAR V3 prepared for Dallas
FDD	Whole-Building FDD	Xiufeng Pang	New draft RTAR prepared for Chicago Update needed.
FDD/ Wireless?	RTAR-Energy Audit using Smart Phones with Low Cost IR Cameras	Yuebin Yu, Zheng Song	New RTAR presented in Dallas

FDD	Value of virtual sensors in RTU control
-----	---

Subc	Project	RTAR Contributors	Status
FDD/ Wireless?	RTAR-Realized Value of Virtual Sensing Technology in the Operation of Packaged Air-Conditioning	Yuebin Yu, Haorong Li	New RTAR presented in Dallas
SG	Status and Benefits of Demand Response Program for Residential Buildings	Jin Wen (rev: Srinivas K)	More work needed to be done on the draft RTAR. New champion needed. Bill Palieuta identified as potential contributor. Update needed.
FDD	Low Cost FDD tools for Residential Systems	Haorong Li (rev: Bill Healy)	RTAR will be developed for San Antonio Update?
BOD	Model predictive controls	Nick Gayeski (A. Athenitis)	Nick developed outline and will write RTAR using input from MPC-related program for Dallas meeting. Update?
FDD	Validation of SPC207P Method of test...	Kristin Heinimeier	SPC 207P to develop RTAR/outline for San Antonio. Lead identified, Update needed.
	XML	Mike Pouchak	Possible collaboration with 7.5 Update needed
WL	Assessment tools and the use of wireless in the field	Zheng Song, Bill Healy	New idea in Dallas.
WL	Use of memory capabilities in wireless sensors for distributed control	Yuebin Yu	New idea in Dallas.
WL	Energy Harvesting sensors		New idea in Dallas.
WL	Use of wireless sensors for temporary installation to collect data in retro-cx projects		New idea in Dallas.
WL	Use of wireless devices for home energy systems		New idea in Dallas.

FDD Idea	What is the most effective way to present results to operators- monthly meetings, weekly emails- in a way that they take action. (related to dashboard- 'data and interfaces- RP)
FDD idea	FDD for datacenters
FDD idea	Whole Building FDD through smart-meters (champion?)
FDD idea	Reduced-model to predict real-time building/zone load
Existing WL idea	RTAR on interference effects on wireless systems in buildings (Smart Grid Interoperability Panel's Home-to-Grid Working Group is looking into electromagnetic interference issues)
WL discussion	Is wireless adoption slow? Causes, needs. What is holding back greater penetration of wireless. What niches are growing and why?
Existing SG idea	Oasis
SG idea	The connection between smart meter and home owners, consumer acceptance response and benefits – Jeff Haberl
SG idea	Develop guidelines for facility smart grid integration readiness – Dan Sullivan
SG idea	Facility interaction with Smart Grid and strategies for building response to smart demands – Wang Shengwei
SG idea	Green button initiatives and what to do with smart grid data – Ram/Krishnan
SG idea	Review and recommendations for adoption of OpenADR, SEP 2.0, METRI/Ecc and other protocols for smart grid implementation – Hiroei Mikami
BOD	Focus on energy generation technologies for NZE building target (Daihong Yu)

**ASHRAE TC 7.5 Smart Building Systems
2013 Summer Meeting
Denver, CO
Tower Court (D), Sheraton Hotel
Draft Minutes**

Date: Tuesday, June 25, 2013

Meeting called to order at 3:30 pm by Chair Carol Lomonaco.

Adrienne Thomle presented Carol with an ASHRAE Certificate of Appreciation.

1. Roll Call and Introductions. Review VMs, CMs, and PCMs.

5 of 7 voting members present: Carol Lomonaco, Carlos Haiid, Steve Blanc, Shengwei Wang, and Xiaohui Zhou (Joe)

2 Members Absent: Meli Stylianou and Robert Sonderegger. Quorum achieved.

Review of VMs, CMs, PCMs to be done after July 1, 2013

2. TC 7.5 Scope

Chair read scope of Technical Committee.

Scope

Technical Committee 7.5 is concerned with the performance and interactions of smart building systems (SBS), the impact of smart building systems on the total building performance, methods for achieving more intelligent control and operation of building processes, including supervisory control strategies and the optimization of dynamic building components and systems, interactions of smart buildings with utilities, and documentation of the benefits of smart buildings and smart building systems as they relate to energy consumption, cost of operation, maintenance, occupant comfort, building commissioning, operations, and impact of the SBS on utilities and natural resources.

Name change for Wireless Subcommittee to Enabling Subcommittee

3. Approval of Dallas Winter 2013 Meeting Minutes

Corrections:

Motion to approve with minor corrections

Dallas 2013 Meeting minutes

- Zheng O. moved and Steve B. second. 4-0-1 (7) Chair voting.

Joe abstained as he did not attend the Dallas meeting

4. Announcements

- See attached notes and files for details
- Carol was not able to attend Chair breakfast
- New requirements for voting at meetings

5. Liaison Reports

TC1.5 ---No one attended to give an update

Chariti Young ---TC 1.4 ---Three active research projects. Two of which are just finishing up. WS just finished. Will be looking for possible member interest in PMS..

David Bournside -- TC 1.6 --Continues to work on standard definitions to be updated in Wikipedia.

Mike Brambley ---TC 7.3 ---Gave a brief update. Moving forward with Chapter 39 revisions. They are reviewing some of our handbook material.

TG1.Optiimization --No one attended

SPC201 ---Krishnan gave a brief update. Facility/grid data interchange protocol. Contact Steve Bushby or David Homburg for more information.

Kristin Heinemeier ---SPC 207 chair. Key topics included: refrigerant charge, airflow and economizer faults. Working groups for each working group area. Draft standard available for needs additional input. Goal is to finalize by 2015.

6. Fault Detection and Diagnosis Subcommittee (Yuebin Yu)

Full details of the subcommittee meeting are available in the attached minutes.

7. Wireless Applications Subcommittee (Bill Healy)

Full details of the subcommittee meeting are available in the attached minutes.

Proposed name change to: Enabling Technologies

New chair: Nick Gayeski

8. Smart Grid Subcommittee (Krishnan Gowhri)

See minutes/notes from subcommittee meeting.

9. Buildings Operations Dynamics Subcommittee (Carol for Li Song)

See minutes/notes from subcommittee meeting

Dr. Li Song is the new chair.

Comments to be provided for WS on “Distributed Control....” Volunteers included: Josh Wall, Steve Blanc and Jin Wen and Zheng O’neil to help review and refine.

Additional volunteers for helping handbook review.

10. Research (Carol Lomonaco for Natascha Milesi Ferretti)

See minutes/notes from subcommittee meeting

- Announcements

See notes from Research Chair breakfast meeting.

Seminar 30 “Where are we now with Research Plan..” good information on topics of interest to RAC. It would be beneficial to have that information distributed at the Research Chair breakfast to carry information to TC research subcommittees. Phil will check to see if Dr. Pradeep’s presentation could be distributed to TCs for information on research gaps.

New RTARs template should be ready in a few weeks? See attached example in new format.

ASHRAE XChange available:

<https://www.ashraexchange.org/forum.php?s=66872d94f5aaeb14f6517d9a01fef7a9>

Carol looking for at least 3 new RTARs for discussion in New York.

- **Work Statements**

See attached minutes for more details.

11. Program (Xiaohui Zhou (Joe))

See minutes for details

From Zheng O’Neil -----TG 1.0 Optimization asked for co-sponsorship of seminar two seminars for New York:

1. Online optimal scheduling for demand response under RTP
2. Applications of dynamic optimizations in smart buildings.

ASHRAE HQ Program Deadlines

New York- January, 2014

- August 13th for seminar abstracts
- September acceptance/rejection

Seattle – June, 2014

- September 23rd Conference Paper deadline
- February 13th, 2014 deadline

12. Handbook (Mike Brambley)

Request to review section for handbook section. See attached draft text.

Schedule for Completion of Smart Building Systems Handbook Chapter

Action	Due Date
Revisions to FDD section; final edits to sensors and grid	Saturday, August 31, 2013
Integrate sections and introduction into a single chapter	Monday, September 30, 2013
Review by Handbook Subcommittee	Thursday, October 31, 2013
Revisions in response to reviews	Saturday, November 30, 2013
Distribution for full TC review	Monday, December 2, 2013
Reviews by TC members	Tuesday, December 31, 2013
Revisions in response to full TC review	Friday, January 10, 2013
Distribution of revised version to full TC	Sunday, January 12, 2013
Handbook subcommittee meeting	Sunday, January 19, 2013
TC vote for approval of IBS chapter	Tuesday, January 21, 2013

Applications --- Just completed cycle

Chapter 41, Supervisory Control Strategies and Optimization ---Nick Gayeski leading.
Discussing re-draft with original author Jim Braun

Chapter 39, contribution to Operation and Maintenance Management (led by TC 7.3) on FDD

--- Mike Brambley will coordinate

Chapter 40, contribution to Chapter 40, Computer Applications (led by TC 1.5) on wireless applications --- Bill Healy will coordinate

New chapter on Smart Building Systems:

Fault Detection and Diagnostics section: Srinivas Katapamula will lead, volunteers: Haorong Li, Peter Armstrong, Nick Gayeski, Daihong Yu, Yuebin Yu Schedule: End of April

Sensing and Actuation section: Bill Healy will lead, volunteers: Sekhar Kondepudi, Edward Tsui Ka Cheung, Haorong Li, Daihong Yu. Chariti Young will liaise with TC 1.4 since there might be some overlapping material. Schedule: End of April

Smart Grid section: Rich Hackner will lead. Volunteers: Carlos Haiad, David Holmberg, Meli Stylianou, Glenn Remington, Krishnan Gowri, and Tianyun Gao Schedule: End of April

Introduction...smart technologies for smart building: Mike Brambley will lead.
Volunteers: Greg Jordan, David Wilts, and Bill Healy

in Wikipedia updates. Carol will follow up and may establish a working group

13. Web Page (Mike Galler not in attendance)
No updates

14. Old Business
No Old Business

15. New Business

NYC show is Tuesday-Thursday

Srinivas recognized the great job that Carol has done as Chair.

16. Adjournment

Meeting adjourned at 5:58 pm

TC 7.5 Fault Detection and Diagnosis Subcommittee Meeting Minutes

2013 Annual Meeting, Denver, CO
Sunday, June. 23, 2013
3:00pm-3:45pm
Governor's Square 14, (PC)

(Minutes of all TC/TG/TRG meetings are to be distributed to the committee members within 60 days following the meeting)

Yuebin Yu presented on behalf of Dr. Haorong Li as the Chair for this meeting.

The meeting was called to order by Yuebin Yu, followed by reading the purpose statement of FDD subcommittee.

1. The meeting started with a quick self-introduction of the attendees.
2. Copies of the meeting agenda were distributed to the attendees. Time allocation was clarified.
3. The meeting went on with a discussion on the existing research RTARs/WSs (30 minutes)
The main things that we went through include the research RTARs/WSs (30 minutes), open discussion (5 minutes), and program (8 minutes).

Research:

Currently, five active/pending RTARs/WSs (RWs) are in the pipeline. The champion of each RW provided a brief update of the current status.

3.a. "FDD Methods for Supermarket" [WS Champion: Zheng O'Neil]

The committee has voted on this WS in April and submitted it to RAC for review. It was returned by RAC in April with some comments. Based on what we proposed, they want us to do more literature review to understand the current state-of-the-art. The WS was initiated about two years ago.

The WS is now in a good shape and Zheng will revise and finish it by Aug with a TC 10.7 called co-sponsorship. Philip commented that someone may have ideas on any emerging products in the area for FDD in supermarket, especially the refrigeration system, to make sure the society is not competing with existing products, such as ones from Danfoss. One volunteer was recruited to help. (Yuebin Yu can also help with the writing on the status.).

3.b. "Reducing Simultaneous Heating and Cooling in Commercial Buildings" [RTAR Champion: Danny Tassevigen]

The RTAR was conditionally accepted. We are invited to work on the work statement, maybe Phillip should also involve. We are asked to seek for co-sponsorship/ participation from TC 1.4 controls and TC 7.6 building performance. This topic is concerned by all the TCs but from quite different points of view. Zhen is working with Danny Tassevigen on developing the WS.

3.c. "Whole Building FDD" [RTAR Champion: Xiufeng Pang, David Yuill]

Per David's feedback, the RTAR has stalled for a while. It is still at the very first stage to develop the RTAR. There were some discussions between the authors. It was found that more research is needed.

Many things are going on in the commercial world and certainly we don't want to repeat what the commercial world is already doing.

Nicolas made some comments on clarifying the role of us. Many companies are using metered data, data driven model FDD, for making recommendations on operation. What is new and different about what we are going to do? Philip addressed further on the technical issues based on whole building simulation model and empirical model. Carol added that based on Dallas minutes there was a draft copy of this RTAR. David later on followed up and provided the copy, which seems still missing the main writings. Xiufeng will work with David and Yuebin on the RTAR to catch the NewYork ASHRAE meeting.

3.d. "DIY Energy Assessment Using Smart Phones with Low-cost IR Cameras for Residential Buildings"
[Champion: Yuebin Yu and Song Zhen]

The topic was brought up by Yuebin and Song Zhen in the last Dallas winter meeting. It is now developed from an RTAR to a WS. Yu briefly read through the executive summary. The WS can be sent to Phillip once it's ready. Jin Wen volunteered to help further review the WS.

One question was also raised by Jin Wen about the goal of this project. Yuebin clarified that we want to eventually develop of kind of tool to help energy assessment for residential buildings (and enable more IT in FDD applications). Steve mentioned some project in California that offers various levels of rebates for home owners with energy auditing from several hundred to thousand dollars. Jin Wen mentioned the research might be more customer-oriented, such as self-checking, to benefit the society. A copy of the WS will be sent to Jin Wen and Bing Dong for more comments.

3.e. "Realizing value of virtual sensing technology in the operation of packaged air-conditioning units"
[Champion: Yuebin Yu and Haorong Li] (seek for co-sponsorship from TC1.5)

This RTAR was brought up and championed by Yuebin Yu and Haorong Li. We discussed a little bit in the Dallas meeting. More and wider review comments from the volunteers are needed to shape the research scope and develop it into a WS.

Jin Wen volunteered and mentioned that EEBHUB did some work focusing on virtual sensing for packaged system. The literature review should also cover those new results. Machal (through Jin Wen) and Daihong will be involved in the writing and developing of this RTAR.

3.f. Discussion on ideas on the parking lot

Call for champions on inactive research ideas on the parking lot. Jin Wen expressed interest in writing "Standard Methods for Testing FDD". Dave (check the name) will help develop this into RTAR. Someone mentioned that there is a Standard 207 for testing FDD, but it is specifically for RTUs only. FDD in different equipment, such as AHU, will be very different from it.

4. Open discussion on new ideas

Research like "Metadata terminology for FDD" from Nicolas. Among the vendors who offer FDD software platform, there is an effort to establish some kind of metadata naming convention to assign data to certain points or equipment and eventually enable FDD, model identification, and smart building operation. A team is needed to work on this. Someone (name is needed) from BACnet committee mentioned their committee will be interested in research that could for example make FDD go through BACnet. A connection will be made later on between the two committees and probably get broader participation from others. Seminars may also be needed to get more concerns.

5. Program update

Three on the list for future per Xiao Zhou.

Srinavas and Carol chair: “ad avocation and Successful story for FDD”. Try NewYork 2014.

Srinavas chair: “Fundamental FDD”. Ask for help from John House to identify the speakers. Try Seattle 2014. John mentioned it is a good idea.

Mick Brambley “FDD for packaged RTUs and splits- what is new?”. Proposed for Dallas, but was not accepted. Mick will try to track with the speakers and resubmit it for NewYork.

David Yuill will be able to help identify speakers from the Boulder workshop and start a new program chaired by David.

6. Handbook on FDD

Srinavas mentioned that we made some progress but there are still much efforts needed to make the writings into a handbook format. The deadline could be this August. Mike will discuss more in the Handbook meeting.

The meeting was adjourned around 3:50pm.

Wireless Applications Subcommittee Minutes
ASHRAE TC 7.5, Smart Building Systems
2013 Annual Meeting
Denver, CO

Date: Sunday, June 23, 2013

Meeting called to order at 3:50 pm

Discussion of Scope and Name

The subcommittee discussed the possible name and scope change. At the last meeting, we had discussed the change to “Enabling Technologies.” Some comments included avoiding overlap with TC 1.4, which has sensing and actuating, and TC 1.5 who has an “Emerging Applications” subcommittee. Sensors alone are not enough, so we need to emphasize smart sensors. Comments were provided that indicated that the subcommittee should not be too specific to allow flexibility. However, it was pointed out that it needs to have some focus, as the initial scope was a catchall.

Subcommittee narrowed in on an initial focus of Smart Transducers and Communications for use in Smart Buildings. These items will be incorporated in the scope.

Program

Bill Healy interested in organizing a seminar on “Sensing Technologies to Enable Smart Homes” for New York. Speakers from NIST, PNNL, and EPRI have been lined up.

Potential program was discussed on the role of cloud-based communication on smart meter technology. Emerged as a forum with Jerine Ahmed leading the effort.

The lingering program “Location guidelines for installing low power wireless networks” will be removed from the list.

Mukesh Khattar is still interested in the issues of security issues with connected devices, though it was indicated that TC 1.5 had such a seminar recently. Hold idea for future conference.

Other ideas tossed around were: Future of wireless for HVAC&R Industry, Secured Wireless for HVAC Applications, and Smart Transducers.

Handbook

Discussed briefly the contribution to the proposed Smart Building Systems chapter on Smart Sensing and Actuating Systems.

Research:

No progress was reported on previous ideas. Assigned people were not present at the meeting.

Idea was brought up on data standards for connected devices. A number of parties appear to be working on this effort, but the subcommittee should keep an eye out to see if the features of smart sensors and actuators are captured in these efforts.

Meeting adjourned at 4:35 pm

Smart Grid Subcommittee Meeting Minutes
ASHRAE TC 7.5 Smart Building Systems
2013 Summer Meeting, Denver, CO
Governor's Room 14 (Sheraton Plaza)

Date: Sunday, June 23, 2013

Time: 4:30 – 5:15 p.m.

1. Roll Call and Introductions
 - Meeting called to order at 4:45 p.m.
 - About 20 members present, no introductions made due to lack of time
 - Roster sign-up sheet was circulated and included with the main committee meeting minutes

2. Review of Minutes from Dallas
 - Programs and research proposals discussed at the Dallas meeting were reviewed

3. Liaisons reports – SPC 201, NIST SGIP, BACnet, others
 - SPC 201P is expecting to finalize a publication public review draft at this meeting
 - SEP 2.0 (Smart Energy Profile 2.0) has been finalized and included in the SGIP catalog of standards
 - Open EI and Open EIS are recent initiatives for standard data format for utility rates, interval meter data and energy information

4. Research Ideas – Discussion
 - RTAR 1543 – Officially withdrawn
 - A new guideline proposal for standard reference data for FDD was discussed. Participants suggested to discuss this topic with FDD subcommittee – no Champion identified
 - Guideline 14 – Calibration of models with interval metered data –Agami Reddy's name was recommended to revive this effort.

5. Program Proposals for New York
 - Special session: Value of smart meter for consumers: Chair – Carlos
 - Seminar: What is Green Button, Open ADR, Open EI? Chair - Dave Holmberg
 - Seminar: Using smart meter data to change consumer behavior – Chair - Ram Narayanamurthy

6. Other topics/New Business
 - Transactive control and its impact on HVAC engineers – this will be topic of discussion for the subcommittee in New York. Ram Narayanamurthy and David Blum volunteered to provide updates at the next meeting.

7. Adjournment – Meeting adjourned at 5:15 p.m.

Building Operations Dynamics Sub-Committee (7.5TC) Sub-committee of TC7.5: Building Operation Dynamics Research

Meeting minutes on 6/24/2013, Denver
Provided by Li Song

Research

- Potential ATARs:

1. "Simulation based optimization for integrated whole building control" lead by Hashem Akbari.
2. "Model accuracy impact study on MPC" lead by Andreass Athienitis.
3. Human physical sensing control, recommend send topic to Carol for TC research discussion

- Existing WS:

1. "Distributed control WS needs revisions" lead by Josh Wall. Carol will provide RAC's comments to Josh Wall; Andrew Windham to contact Josh Wall to offer help for improving the WS.

Program:

1. New: "Building operation dynamics-high mass buildings" lead by Andreass Athienitis, prepare for New York
2. New: "Model-based commissioning, target Seattle" lead by Xiufeng Pang, prepare for Seattle.
3. Old: "How BAS can enhance RCx lead" by Carol Lomonaco , target on New York
4. Old: "Possible forum: What to do with optimal control?" no lead, need to ask Josh
5. Old: "Presentation on simulation tools" lead by Jin Wen, prepare for New York
6. Possibility of co-chair a rack or seminar with TC7.9 (building commissioning), lead: Li Song

7. New: “Research summit: Integrated building assessment for Seattle” lead by Hashem Akbari, prepare for Seattle.

Handbook:

Volunteers to review Handbook:

David Blum

[Gary Shamshoian](#)

Hashem Akbari

Recommendations of the Scope Updates:

By Gary Shamshoian:

Building Operation Dynamics Subcommittee of TC7.5 focuses on the important of indoor comfort conditions and building/campus/enterprise energy consumption through HVAC system design, dynamics, controls, occupant interactions, and building operational strategies.

Hashem Akbari has volunteered to provide an improved draft.

ASHRAE TC 7.5: Smart Building Systems
Research Subcommittee Meeting Minutes, Rev 1 Jan. 21, 2014
Denver 2013 Summer Meeting
Monday, June 24, 2013, 5:30 – 6:30 p.m.

Room: Colorado

The meeting was chaired by Carol Lomonaco (Natascha could not make the Denver Mtg).

The meeting began at 5:30pm. A few paper copies of the agenda and research plan notes were distributed. A network drive was not available for file download. Later the Google Group TC 7.5 was given out for attendees to access after the Research subcommittee meeting.

1. Announcements:

The Research Chair's Breakfast meeting was reviewed and the important points are noted in the following sections:

- a. ASHRAE Service to Research Award- Need to nominate individuals.
- b. Current and future projects
Since July 2012
 - i. 58 active RPs (Total Value > \$11 million)
 - ii. 14 projects completed
 - iii. 11 new projects started
 - iv. 14 TRPs released for bid
 - v. Shortage of new proposals
 - vi. Need more RTARs/WSs to get through the process
 1. Why RTARs get returned: idea not appropriate for ASHRAE funding; inadequate references to past work or existing literature, not clear on how state of the art is advanced, budget is out of line with scope.
 2. RAC is changing RTAR/WS format to simplify process for TCs-not available yet to download
 - vii. Unsolicited Research Proposals
 1. 3 types: extension of completed ASHRAE research, revision of a special pub, new research
 2. Increased submissions-
 3. URPs have to be sponsored by a TC, RAC advises converting URPs to WSs
- c. ASHRAE Grants in Aid for Grad Students (10 k each)
 - i. Announcement
 - ii. X applications, Y approved
- d. Homer Adams Award
 - i. Single applicant,
 - ii. Meant for graduate students participating in ASHRAE sponsored RP
- e. New Investigator Award
 - i. 5
- f. Innovative Research Grants (50k/year up to 125k)
 - i. None approved, 3rd call with 2nd round of guidance revisions to go out this year
 - ii. 18 proposals, 3 invited for full proposals
 1. Innovative new work of value to ASHRAE community
 2. Not product development, not just contribution to ongoing projects
- g. Denver Program, two mini-conferences
 - i. Seminar- "How can I participate I the ASHRAE Research Program"
& Seminar "Are We There Yet? Review of the 2010-2018 Research Stategic Program
 - ii. Research- related to research plants, on-going research, or results
- h. ASHRAE research strategic plan 2010-2015 is the current reference, updates on 8-year cycle.
- i. RAC strongly encourages the submission of holistic research projects such as 'sustainability'

j. Philip Haves is the Section 7 Research Liaison

2. Status of Research Projects

- a) Co-sponsored URP-1633 (PMS meeting Tuesday 9:00 am, City View 3, Reinhard Seidel PMS Chair)
The project consists of five major tasks:

(Completed) Survey: Survey of existing EMCS user interfaces, types of metrics used and types of displays for them. Define stakeholders and their interests.

(Completed) Questionnaire: Create questionnaire for stakeholders in detail by presenting existing metrics from other systems and determining what the stakeholders want that they don't currently have, and whether some other existing metrics/displays would work for them.

(Completed) Interviews: Execute interviews with stakeholders using the developed questionnaire, and create a matrix of responses to allow evaluation of most popular/useful/requested metrics

(Jan 2013) Interfaces: Develop mock user interfaces with the information from previous steps, so that a number of dashboards for different stakeholder types (energy manager, daily operator) are created containing the most requested features

(May 2013) Rank Interfaces: Review interfaces with stakeholders from step 3, and allow them to rank the results to pick the best approaches.

A no-cost extension was being sought.

- b) Tentative Research Projects (TRPs): none at this time.

3. Work Statements

- a. 1615-WS: FDD Methods for Supermarkets (Zheng O'Neill).

- i. WS submitted Feb 12. 4/12 RAC returned with comments:

- Describe envisioned methodology
- Better define tasks
- Cite more existing researchers as qualified bidders

- ii. [New draft WS](#), version 7 ready. [RAC Comments addressed](#) and Sec. 7 Research Liaison comments addressed. [Due for TC vote in Dallas](#)- MUST BE SUBMITTED AND APPROVED FOR BID BY JULY 1, 2014 OR TOPIC WILL BE DROPPED PERMANENTLY.

- a. 1671-WS Real-Time Optimal Control in a Distributed Environment (Josh Wall)

- i. WS submitted Feb 12. 4/12 RAC returned with comments.

- Describe major outcomes
- Obtain cofunding
- Better define task 3
- Cite more qualified bidders

- ii. Comments addressed and due for TC vote in Dallas- MUST BE SUBMITTED AND APPROVED FOR BID BY JULY 1, 2014 OR TOPIC WILL BE DROPPED PERMANENTLY.

- b. 1543-WS Demand Response Optimization Protocol and Integrated Training

- i. Dropped from RAC list. Will write a RTAR based on the Workstatement ideas. Rich to seek a new Champion.

4. Reports on RTARs (Needs updates pre- Denver Meeting emails)

- a. Reduce Simultaneous Heating and Cooling in Commercial Buildings- 2nd version ready in San Antonio, feedback is needed by Dec 2012 Reviewers identified (Joe, Daihong, Danny T.)

- b. Whole-Building FDD (Xiufeng Pang) -A new RTAR was prepared for Chicago. Champion was not in San Antonio. Haves to request latest version from XP and send to reviewers: David Yuill, Li

Song, CC: NMF

- c. Low Cost FDD tools for Residential Systems- Background: Jon Engelber was the champion but he was not present. Haorong Li will prepare the RTAR for the next meeting.
 - d. Model predictive controls - Nick developed outline and will write RTAR using input from MPC-related program for Dallas meeting. Reviewers: (Athenitis)(O'Neill)(Hackner)(Wang)
 - e. Status and Benefits of Demand Response Program for Residential Buildings- no change\ More work needed to be done on the draft RTAR. New champion needed. Bill Palieuta identified as potential contributor. Carol to check Montreal minutes.
 - f. Validation of SPC207P Method of Test. Kristin Heinemeier will confirm whether Jim Braun is the Champion.
 - g. Conditioning People for More Dynamic Indoor Environments (Josh Wall). No update
5. RTARs and WSs Co-Sponsored by TC 7.5
- a. Co-sponsorship requested "HVAC System Performance and Thermal Comfort Control using Work & Data Exchange Processes" TC (1.5) RTAR in development for San Antonio
 - b. RTAR VAV System Setpoint Reset- no update.
6. Old Business: Discussion of need for Training/Mentoring on Writing RTARs .

Carol Lomonaco suggested a seminar.

Discussion:

- (Brambley) create list of people with experience writing successful RTARS that can be contacted.
- (Carol) Training module on ASHRAE website
- TCs who have no in-house resources are in particular need (Haves)
- We believe this is a **systemic** issue.
- Need to provide 5-6 good examples.
- (Note from main TC meeting regarding conciseness: details help contractors, and what is needed.)

List of interested persons:

Danny Taasevigen, Li Song, Tania, Ullah, Guanjin Lin, Mayumi Miura, Daihong, Yu, Yuebin Yu

7. New Business, Carol challenged everyone at the Denver Research Subcomm Meeting volunteers to write three (3) new RTARs. We got five volunteers.
8. Adjourned at 6:30pm

TC 7.5 Program (Draft) Report for Denver, CO, 2013
Xiaohui (Joe) Zhou
06/25/2013

I. TC 7.5 Program Accepted for Denver Meeting

No TC 7.5 sponsored seminar submitted for the Denver Meeting

II. Program Subcommittee Chair Training

Program chair participated the chair training on Tuesday (6/25) 11:15am – noon.

1. Jon Cohen (New York Program Chair) hosted the training.
2. Introduction of CEC: Conferences and Expositions Committee.
3. New York Program will focus on workshops instead of special sessions.
4. Program Options
 - Tech papers, 30 pages max, double-blind and commercialism review, final papers required 9 months before conference, published in transactions.
 - Conference papers, 8 pages max, less rigorous, can highlight case studies or ongoing research, single blind, abstracts due 9 months before meeting, then 3 months later accepted papers are due.
 - Seminars & forums, same process, scheduled after tech & conf. papers, TC selects chairs and speakers, abstracts due 6 months before meeting, presentations due 1 month prior. Look to highlight 1~2 Panels and/or Debates for Denver. All sessions need learning objective and Q&As, except Forum/Debate/Panel sessions.
5. Program chair work with Track Chairs.
6. CEC loves TC to suggest reviewers for technical/conference papers.
7. ASHRAE Website: www.ashrae.org/newyork ; www.ashrae.org/seattle .
8. Typical program schedule – two years in advance
 - Next several meetings:
 - 2014 Winter New York
 - 2014 Summer Seattle
 - 2015 Winter Chicago
 - 2015 Summer Atlanta
9. Conference paper session is encouraged to be organized by TC.

10. Encourage session chair to let Track chair know as soon as TC has decided to organize a conference paper session.

IV. Program Notes for New York Meeting

January 18- 22, 2014, New York, NY, USA

- **Track 1: Systems and Equipment**

Track Chair: Yunho Hwang

- **Track 2: Fundamentals and Applications**

Track Chair: Dan Fisher

- **Track 3: Indoor Environmental Health/Indoor Environmental Quality**

Track Chair: Thomas H. Kuehn

- **Track 4: Building Information Systems; Integrating Technology for Control, Management, Optimization and Efficiency**

Track Chair: Kevin Gallen

- **Track 5: International Design**

Track Chair: Samir Traboulsi

- **Track 6: Improving Building Performance through Commissioning, Operation and Maintenance**

Track Chair: David E. Claridge

- **Track 7: Hydronic System Design for Efficiency and Large Buildings**

Track Chair: Douglas C. Cochrane

- **Track 8: Tall Buildings: Performance Meets Policy**

Track Chair: Wade Conlan

Conference Program Chair: Jon Cohen

March 15	Conference Paper abstracts due
April 5	Conference Paper accept/reject notifications
April 19	Full Technical Papers due

June 1	Web Site Opens for Seminar and Forum Proposals
July 2	Final Conference Papers Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment)
Aug. 13	Seminar and Forum Program Proposals Due
Aug. 13	Technical Papers Final Review
Sept. 20	Notifications of Seminar and Forum Accept/Reject Distributed
Dec. 6	Upload of PPTs Begin
January 3, 2014	All PPTs Due Online
Jan. 18	Speaker's Lounge Opens

IV. Program Notes for Seattle

- **Track 1: Indoor Environment – Health, Comfort and Productivity**
Track Chair: Thomas H. Kuehn
- **Track 2: Research Summit**
Track Chair: David E. Claridge
- **Track 3: Ground Source Heat Pumps: State of the Art Design, Performance and Research**
Track Chair: Jeffrey Spitler / Michael Kuk
- **Track 4: HVAC&R Systems & Equipment**
Track Chair: Kevin Gallen
- **Track 5: HVAC&R Fundamentals and Applications**
Track Chair: Daniel Fisher
- **Track 6: Standards, Guidelines and Codes**
Track Chair: Samir Traboulsi
- **Track 7: Refrigeration**
Track Chair: Pam Androff
- **Track 8: Installation, Commissioning, Operation, Maintenance of Existing Buildings**
Track Chair: Sarah E. Maston

- **Track 9: Professional Skills**

Track Chair: Pam Androff

Conference Program Chair: Mike McDermott

- Sept. 23 Conference Paper abstracts due
- Sept. 23 Technical Papers due
- Oct. 7 Conference Abstract accept/reject notifications
- Jan. 6, 2014 Web Site Opens for Seminar and Forum Proposals
- Jan. 9, 2014 Final Conference Papers Submitted for Review (Includes Bio, Learning Objectives and Methods of Assessment)
- Feb. 13 Seminar and Forum Program Proposals Due
- Feb. 21 Conference Paper accept/reject notifications
- Feb. 25 Technical Papers Final Review
- March 25 Notifications of Seminar and Forum Accept/Reject Distributed
- May 6 Upload of PPTs Begin
- June 2 All PPTs Due Online
- June 28 Speaker's Lounge Opens

V. Program Ideas for New York:

Sub Committee	Type	Chair (speakers)	Proposed Title	Status
BOD	Seminar	Chair: Andreass Athienitis	Building Operation Dynamics - High Mass Buildings	Submit for New York
BOD	Seminar	Chair: Nicholas Gayeski (Oneill/Henze/	Overcoming Barriers to Implementing Model Predictive Control for Building Operations (EE, DR, Peak Load Reduction)	Resubmit for New York
BOD	Seminar	Carol Lomonaco & Steve will check on speaker	How Building Automation System Can Enhance Retro-commissioning	Submit for New York
NBT	Seminar	Chair: Bill Healy	Smart Technologies to Enable Smart Homes	Submit for New York
NBT	Forum	Jerine Ahmed;	The Role of Cloud-based Communication on Smart Meter	Submit for New York
NBT	Seminar	Chair: Nicholas Gayeski	Smart Transducer with Embedded diagnostics	Submit for New York
FDD	Seminar	David Yuill try to find speakers from DOE Intelligent Buildings Operations Workshop participants	Fundamentals of FDD	Submit for New York;
FDD	Seminar	Srinivas, Carol; 3 speakers ready	Applications and Successful stories of FDD	Submit for New York
FDD	Seminar	Mike Brambley; 3 speakers ready	FDD for packaged rooftop units and split systems, what's new?	Submit for New York
FDD	Seminar	Chair: Kristin Heinemeier; Speaker: Kristin & Jon Douglas,	Fault Detection and Retro-commissioning: Where is the line and does it matter?	Submit for New York

		someone from TC 7.9?		
SG	Seminar	Chair Rom Narayanamurthy; Speaker: Steve Blanc	Use of Smart meter data for consumer behavior	Submit for New York
SG	Seminar	Chair: David Holmberg	Green Button / Open ADR / (Open EIS)	Submit for New York
SG	Special Session	Chair: Carlos	Value for Smart Meters for Consumers	Submit for New York

VI. List of Future and 'Dead' Program Ideas to be Kept for Future Reference

Sub Committee	Type	Chair/Speakers	Title	Status
General	Seminar	Lomonaco	Writing a successful RTAR	For Future
WLS	Seminar	No champion	Experience in using wireless	For Future
WLS	Forum	No champion	Future of Wireless for the HVAC&R Industry	For Future
BOD	Forum	Josh?	What to do with optimal control	For Future
BOD	Seminar	Chair: Xiufeng Pang	Model-based Commissioning	For Seattle
BOD	Seminar	Chair: Jin Wen	Control Strategy Simulation Testbeds / Simulation Tools -Drexel w/ pv,different controllers, energy plus models etc as a development tool -LBNL -NIST Vcbt? COBIE (army corp of engineers)	For Seattle
SG	Seminar	Chair: David Holmberg? Rich to contact David	Demand Response and the Energy Interoperation Standard	For Future
SG	Conf. Paper	No Champion	Beginners Guide to Smart Grid	New idea in Albuquerque, Dead
SG	Seminar	Carlos & Steve	Handling large amounts of real-time data	New idea in Chicago, need ideas and champion. Dead
SG	Seminar	Rich Hackner	Aggregators Panel	Pulled from Chicago, Short of speakers. Dead
SG	Seminar	Carlos Haiad	Look at local utility pricing/rates structure and compare to other areas	Engage locals. Dead
SG	Seminar	Andreas Athienitis	Net Zero interaction with Grid	Rich Hackner? Dead

Attachments

ASHRAE 2013 Summer Meeting – Denver, CO – June 22-27, 2013



ASHRAE Award
Summary.docx



SH Breakfast
Hndout.A13.pdf



TC 7.5 Voting
Members for New Yor



1671-WS_RACComm
ents-May2013.pdf



1671-WS_RACComm
ents-May2013-Respo



RTAR_IR_DenverMe
eting.docx



RTAR_TC7.5_FDDfor
LargeOffice.docx



WS_IR_Fnal_revised
_v4.docx



2013-RTAR-Form-Exa
mple-r1.pdf