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

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TC/TG/TRG MINUTES COVER SHEET

TC/TG/TRG NO: **TC 7.3**

DATE: **Jan 23, 2018**

LOCATION: **Chicago, IL**

TC/TG/TRG TITLE: **Operation and Maintenance Management**

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PRESENT	TERM IN POSITION	MEMBERS ABSENT	TERM IN POSITION	MEMBERS ABSENT	TERM IN POSITION
John Constantinide (v) (Chair)	2016-18	Michael Bobker (v) (Research sub chair)	2015-19	Keith Dempsey (cm)	2013-
Sonya Pouncy (v) (Vice Chair)	2017-20	Richard Dames (nv) (MTG.BIM liason)	2016-	Christopher Draper (cm)	2012-
David Norvell (v) (Secretary)	2017-21	Richard Danks (v)	2017-19	Frank Erceg(cm)	2013-
Michael Gallagher (v)	2015-19	David Handwork (nv) (APPA1000 liaison)	2017-	Rob Faulke (cm)	2017-
Robyn Ellis (nv) (Program Sub Chair)	2008-17	Henry Hutson (nv) (MTG.OBB liaison)	2017-	Kevin Fallin (cm)	2016-
Charles Dorgan (cm)	1984-	Richard Rooley (v-non quorum)	2017-21	Jared Higgins (cm)	2013-
Cedric Trueman (v) (online)	2017-21	Thursten Simonsen (nv)	2015-	Glenn Hourahan (cm)	2014-
Wayne Webster (nv) (online)	2017-21	Michael Fleming (pcm)	2016-18	Tom Javins (cm)	2015-
Mina Agurabi (v)	2016-20	Michael Brambley (v)	2017-21	Manoj Khati (cm)	2011-
David Cantrill (cm)	2013-	Robert Sibilski (v)	2017-18	Michael Khaw (cm)	2015-
Steven Sill (nv) (Standards Sub Chair)	2017-	Brandley Brooks (pcm)	2017-19	Michael King (cm)	1998-
Davidge (John) Warfield (v) (ALI Coordinator)	2015-19	Danielle Dahan (pcm)	2016-18	Liam Lafferty (cm)	2017-

John Frugard (cm)	2013-	Nicholas Gayeski (pcm)	2016-18	Dawen Lu (cm)	2017-
David Underwood (cm)	1991-	Shaun Green (pcm)	2017-19	Hao Luo (cm)	2017-
Orvil Dillenbeck (pcm)	2017-19	Thulasi Ram Khamma (pcm)	2018-20	Warren Lupson (cm)	2012-
Julia Day (nv) (MTG.OBB liaison)	2017-	Stephany Mason (pcm)	2017-19	Michael Mamayek (cm)	2009-
Stephanie Munger (cm)	2015-	Steven Meier (pcm)	2016-18	Joe Marchese (cm)	2014-
John Gibbemeyer (pcm)	2017-19	Cu Nguyen Khanh (pcm)	2017-19	Steven Marek (cm)	2017-
Khanh Nguyen		Amanda Smith (pcm)	2018-20	Shawn Masterson (cm)	2013-
Billy Austin (G)		Stephen Lee Wren (pcm)	2016-18	William Jack (cm)	2010-
James Brown (G)		Kevin Wyman (pcm)	2017-19	Ross Montgomery (cm)	2002-
Catherine Tinker (G)		David Yancosky (pcm)	2017-19	Matt Mullen (cm)	1996-
Chad Powell (G)		Eric Yang (pcm)	2017-19	Patrick Murphy (cm)	2012-
Rick Dambrosia (G)		William Artis (cm)	2015-	James Newman (cm)	2013-
Jaya Mukhopudheyay (G)		George Austin (cm)	2017-	Brian O'Donnell (cm)	2006-
		Robert Bakes (cm)	2011-	John Rieke (cm)	1995-
		Christopher Benson (cm)	2011-	Terrence Rollins (cm)	2017-
		Bradley Brooks (cm)	2017-	William Ryan (cm)	2011-
		Tina Brueckner (cm)	2013-	Adol Rydzewski (cm)	2007-
		Robin Bryant (cm)	2017-	George Sestak (cm)	1993-
		Thomas Cappellin (cm)	2015-	Treasa Sweek (cm)	2015-
		Patrick Carpenter (cm)	2011-	James Sweeney (cm)	2014-
		Dominador Guzman Castro (cm)	2011-	Dan Taasevigen(cm)	2016-
		Charles Dale-derks (cm)	2017-	Shailen Verma (cm)	2012-
		Andrew Wengerd (cm)	2014-	Christopher Wilkins (research liaison)	2016-20
		James Wilson (cm)	2013-	Rick Heiden (standard liaison)	2016-20
		David Yancosky (cm)	2017-	Michael Vaughn (staff liaison)	2001-
		Doug Yon (cm)	2014-		
		Forest Yount (cm)	2006-		
		Robert Zagar (cm)	2001-		
		Kelley Cramm (cm)	2017-		
		Larry Smith (section head)	2017-21		
		David Ballard (tech transfer head)	2017-21		

TC 7.3 Meeting Minutes

Tuesday January 23, 2018

Chicago, IL, USA

Page 3

Call to Order/Scope/Introductions

John Constantinide called the meeting to order at 1:04 PM. Attendees in the room introduced themselves. An attendance sheet was circulated.

Voting Member Roll Call

1. David Norvell took roll call of the voting members. At the time of roll call, six (6) voting members were present of the ten (10). A quorum was established.

Approval of the Agenda

The agenda for the meeting was presented. Mike Gallagher made a motion to accept agenda and Mina Agarabi seconded. Approved 6-0-0.

Society Liaison and Guest Presentations

Approval of Long Beach Meeting Minutes

The draft meeting minutes from Long Beach were reviewed. Davidge Warfield made a motion to approve the minutes, seconded by Mike Gallagher. Approved 6-0-0.

ASHRAE Administrative Matters/Correspondence/Announcements

John Constantinide asked for a liaison for the newly formed MTG EBO. Mina Agarabi agreed to be the liason but reported that she was unable to attend the first meeting held on Saturday. Michael Bobker is also willing to be an alternative liaison.

Sub-Committee Reports

TC 7.3 Meeting Minutes

Tuesday January 23, 2018
Chicago, IL, USA

Page 4

Research Sub-Committee – Chair: Michael Bobker was not present – Davidge Warfield reported in his absence

Introductions. See separate sign-in list for attending.

Research Projects Status Report

RP 1609. *This is a completed project with a request for further related work under Work Statement 1801, sponsored by TC 1.5. Approval of co-sponsorship was voted at the Long Beach summer meeting. No further update on the status of this WS.*

RP 1650 Operator Training for High Performance Building Systems

- *Project in-progress. The PMS met morning of Tuesday 1/22/18 with PI Dr. Jaya Mukhopadhyay providing a project report. The project has progressed well but survey response rate is lower than desired and the survey period has been extended. Request for a six-month no-cost extension will be made to MORTS, such that project completion would be January 2019. Quarterly project reports and project financial reports are to be submitted by PMS Chair to MORTS.*
- *PMS: Davidge Warfield, chair, Alex Heckman, John Fugard, Michael Bobker and participation from co-sponsoring TC's: TC 2.8 (Kevin Brown), TC 7.6 (Hoyin Kim) and TC 7.8 (Chuck Dale-Derks).*

Requests from Other TC

Co-sponsorship for WS 1781 was approved in Long Beach. This WS is being revised in response to comments from the RAC.

MTG on Occupancy Behavior requests co-development of an RTAR for survey-based research on the relationship of Occupant Behaviors to O&M.

RTAR development and Research Ideas

Julia Day will draft an RTAR on relationship of Occupant Behaviors to O&M. Topics such as over-conditioning of spaces will be included

Rob Falk and Ben Lipscomb will draft an RTAR for research in support of Standard 221P "Test Method to Field-Measure and Score the Cooling and Heating Performance of an Installed Unitary HVAC System" (Public Review anticipated first half of 2018). The research would test and characterize distribution of performance scores and, secondly, test and characterize measurement uncertainties in the Standard's prescribed procedures. Findings on both of these topics are necessary for use of the Standard.

RP 1650 (the relationship between the level of training provided to building operators and the level of building performance)

Davidge reported that the committee had completed task 1 and is currently working on task 2. Task 2 involves collected survey results from building operations and

TC 7.3 Meeting Minutes

Tuesday January 23, 2018

Chicago, IL, USA

Page 5

maintenance staff. The respondents have been slow to come in, so they are extending the time of collection.

Handbook Sub-Committee – Chair: Sonya Pouncy

Subcommittee minutes have not yet been received.

Sonya Pouncy made a motion to approve the Handbook sub-committee report, seconded by Mike Gallagher. Approved by unanimous voice vote 8-0-0.

Program Sub-Committee – Chair: Robyn Ellis

Attendees: John Constantinide, Robyn Ellis, Michael Bobker, Steven Sill, Orvil Dillenbeck, John Frugard, Davidge Warfield, David Handwork, Rob Falke, Mina Agarabi, Stephane Munger, Julia Day, Alexander Zhivov

The following are minutes submitted from the Program Sub-Committee:

1. Introductions

2. Approval of the Chicago Agenda–Approved (moved by John, seconded by Mina)

3. Chicago January 2018: TC 7.3

Sunday, January 21, 2018 8 a.m.

Co-sponsorship with TC 1.4

- **Debate 1: Building Automation System Graphics: Integrating Multiple Masters, Who Is The Boss?**

Chair: Marcelo Acosta

Speakers: Frank Shadpour, and Larry Scholl

- **Workshop 1: District Chilled Water and Building Systems Heat Exchange Equipment and Impact on Operations**

Chair: John Constantinide

Speaker: Terrence Rollins

Interactive session regarding district heating & cooling

District Energy TC members were in attendance.

Format was presentation followed by Audience Discussion.

- **Conference Paper Session 4**

The BAS/HVAC Office: Organizing People to use BAS to Optimize Building Performance (CH-18-C016)

Orvil Dillenbeck

Tuesday, January 23, 2018 at 1:30 p.m.

- **Seminar 47: Requirements for Extreme Weather Operation of HVAC Systems**

Track: Earth, Wind & Fire

Location: State Room, Palmer House

Chair substituted as Robyn is attending main TC 7.3 meeting

Extreme Cold Weather HVAC System Configuration and Operation

Orvil Dillenbeck, P.Eng. Member, Canadian Nuclear Laboratories, Chalk River, ON, Canada

Extreme cold weather can affect HVAC system performance. Despite a designer's best efforts, time and use can allow deterioration to the point where a system can be overwhelmed. With a focus on operational preparedness, this session is about how designers, owners and operators can configure new and existing HVAC systems to handle extreme cold conditions.

4. Announcements –John Constantinide mentioned opportunity with Alexander Zhivov.

5. Upcoming 2018 conferences, tracks and due dates: Houston, TX (Summer 2018), Atlanta (Winter 2019), followed by Kansas City (Summer 2019).

Please note Seminar submissions for Houston are due soon: February 9th 2018.

6. Program Planning and Idea Log -See handout. Logs will be updated subsequently based on meeting discussion.

TC 7.3 Meeting Minutes

Tuesday January 23, 2018

Chicago, IL, USA

Page 6

7. New Program ideas (as well as returning program ideas)

Potential for Houston:

1. **What goes into a successful O&M Training Program.** Michael Bobker, Mina Agarabi & possibly Tom Sahagian for the Professional Track in Houston. Michael will be looking into the possibility of a few speakers including Paul Reale (and/or others).
ACTION: follow-up with Michael, Mina & Tom
 2. **Efficiency Deterioration Documented by Field Test Data of 150 HVAC Systems (Rob Falke for Houston) (W-2018):** – This presentation includes an analysis of substantial field data documenting typical HVAC deficiencies that deteriorate equipment efficiency and the resulting energy impact.
 3. **A New Approach to Testing Uncertainty Analysis (Rob Falke for Houston)–** ASHRAE 221P includes a new generation of uncertainty analysis created by hundreds of hours of work and tens of thousands of calculations using live field data. This type of uncertainty calculation can be applied across the board to any 221P test.
 4. **How to Field-Measure and Score the Performance of an Installed HVAC System (Rob Falke for Houston) (W-2018):** Step-by-step presentation detailing the system scoring testing and calculations included in ASHRAE 221P. To include how-to test procedures, required instruments, and individual calculation methods prescribed in the proposed standard. Will also include typical scores of various types of systems.
ACTION FOR #2-4: Follow-up with Rob Falke with speaker volunteers Mina & John C.
 5. **O&M of Large central plants and distribution systems (W-2018):** Co-sponsor opportunity with 6.2.
Tim Anderson (tanderson@applied-e-s.com) Program Subcommittee Chair, Alan Neely TC Chair, Jessica Mangler (jmangler@aeieng.com)
ACTION: follow-up with Tim Anderson
 6. For Atlanta: Orvil D. is interested in pursuing idea S2013-4 from the Idea Log (regarding Sequence of Operation)
 7. For Atlanta: John C. is interested in a Seminar on BuildingEQ based on 60 submissions recently submitted in his Region.
 8. For Atlanta: John C. related W-2016-3 to edits to CH36 of the ASHRAE Applications Handbook regarding Energy & Water Use & Management.
- Awareness of and training on ASHRAE standards such as Guideline 32, standard 180, etc. was discussed as it relates to both Program & Education.

GENERAL ACTION: Follow-up with Terrence Rollins on his contribution to the Idea Log to see if there is interest moving forward in presenting Program.

8. Opportunities for Program through partnerships with other TC's

TC6.2, Large central plants

9. New Business -Alexander Zhivov presented on the need to address ROI associated with improvements to buildings. Son did Master's Thesis in Denmark on this topic. Davidge noted that Matt Mullins is interested in similar topics and tie-in to TC7.8 (O&M Costs). May be interested in submitting a conference paper (and possibly a seminar following that, only if ASHRAE also has speakers).

10. Adjourn –Approved (moved by Michael Bobker, seconded by Davidge)

Standards Sub-Committee – Chair: Steven Sill

The following are minutes submitted from the Standards Sub-Committee:

TC 7.3 Standards Sub-Committee Agenda

Monday, January 22, 2018, 2:15 – 3:15 PM

Room Salon 6, Palmer House Chicago

TC 7.3 Meeting Minutes

Tuesday January 23, 2018
Chicago, IL, USA

Page 7

1. Attendees: Orvil Dillenbeck, John Frugard, Davidge Warfield, David Handwork, John Constantine, Robyn Ellis, Michael Bobker and Mina Agarabi
2. Call to order: 2:20 pm
3. Introductions
4. Approval of minutes from Long Beach (no minutes received)
5. Status update of on-going standards activities
 - a. Guideline 4: Preparation of Operating and Maintenance Documentation for HVAC&R Systems, Liaison: Davidge Warfield
 - b. Guideline 32: Sustainable, High Performance Operations & Maintenance, Liaison: Orvil Dillenbeck
 - c. Standard 180 – SPC: Standard Practice for Inspection & Maintenance of Commercial-Building HVAC Systems, Liaison: Richard Danks
 - d. APPA Standard 1000: Total Cost of Ownership for Facilities Asset Management, Liaison: David Handwork
 - e. GPC 1.3P – Proposed Guideline: Building Operation and Maintenance Training for the HVAC&R Commissioning Process (Co-cognizant with TC 7.9 lead) Liaison: Michael Bobker
 - f. SPC221 New standard for a method of field testing performance of air handling units (approved in St. Louis), Liaison: Rob Falke
6. Other business
 - A) See Heather Platt willing to be Liaison SPC 180
 - B) John Frugard alternate Liaison to SPC 180
 - C) Robyn Ellis / Mina Agarabi Liaison to MTG/EBO
 - D) Michael Bobker alternate to MTG/EBO
7. Meeting adjournment: 3:10 pm
 - a) Guideline 4: Approved by committee and ready for submission in February.
 - b) Guideline 32: Two comments resolved and ready for public review.
 - c) Standard 180: Entire Standard submitted for public review.
 - d) APPA Standard 1000: Part I key principals were published this year it is a 100-page document that will be an ANSI standard and will be a continuous review. Part II is started and targeted for public review by end of the year.
 - e) GPC 1.3P: Recently submitted and is awaiting to be prepared for publication.
 - f) SPC 221: Public review and TPS was updated and receiving a unanimous vote, was submitted to ASHRAE staff on 8/3, Required documentation was submitted on 9/29, ASHRAE staff reviewed, voted on 12/13 to accept final version of Standard and TPS submitted 12/18, next meeting is 1/23/18.

There was no vote on approving the minutes as there was no longer a quorum.

Education & Training Sub-Committee – Chair: Mina Agarabi

Agenda:

1. Call to Order
2. Introductions
3. Approval of the Chicago Agenda
 - a. Bobker abstain

TC 7.3 Meeting Minutes

Tuesday January 23, 2018
Chicago, IL, USA

Page 8

4. Discuss new timeslot—good for now.
5. Changes/Updates to FAQ 56 & 57
 - a. Basecamp comments
 - b. New comments
6. Any interest to submit more FAQ questions to educate people on O&M?
7. Education and training and/or FAQ on use of Guideline 32
8. Create a survey to issue to 7.3 members to get a sense of what O&M publications they:
 - a. Own
 - b. Regularly reference
 - c. Use to train new staff
 - d. Interest in ALI course(s) on how to comply with O&M standards or follow guidelines
 - e. Any pubs that need updating?
 - f. Continuing education.
 - g. 5 questions? Response rate?
9. Discuss current self learning classes and DOT
10. PEC FPS O&M market focus questionnaire
11. New Business
12. Adjourn at 2:30pm

TC sponsored session to introduce a guideline or standard.
Contact for presentation


ALI Course on 180 eventually. TC sponsored and continue educate workshop at the next winter meeting to get a bigger audience (how to draw the expo attendees) on 180 and 32. Don Langston for 180? To spearhead. Coordinate with Robyn Ellis and Julia. Also maybe research
Distribute survey to Section 7.- talk with Sarah Maston.

International Property Maintenance Code.—referenced by 180??

Haven Cassidy---maintenance staff for gov't will prefer online course can't attend a conference

How do we get O&M integrated into design industry---is it in ASHRAE's ALI supporting O&M – contact Davidge
Work with Robyn to pose a question for a forum for Houston Conference- We know the process (1.3) but how do we train our people.

We can't show MailTips right now.

 Send	From ▼	mina@agarabiengineering.com
	To...	Davidge@aol.com; kmurray@ashrae.org
	Cc...	robert.sibilski@honeywell.com; john.constantinide@alphamrc.com
	Subject	Re: ASHRAE: O&M course feedback and involvement

Hi Kate and Davidge

<https://www.ashrae.org/education--certification/hvac-design-and-operation-training/improving-existing-building-operation>

I am curious to learn how XXXX focus differs from Fundamentals Of Building Operation Maintenance And Management
<https://www.ashrae.org/education--certification/self-directed-or-group-learning/fundamentals-of-building-operation-maintenance-and-management>

TC 7.3 Meeting Minutes

Tuesday January 23, 2018

Chicago, IL, USA

Page 9

There was no vote on approving the minutes as there was no longer a quorum.

Liaison Reports

Old Business

New Business

Next Meeting

The Summer meeting will be in Houston. The full committee will meet on Tuesday June 26th from 1:00 – 3:30 PM.

Adjournment

A Motion by Mike Gallagher and was seconded by Sonya Pouncy to adjourn the meeting was made. Approved 8-0. The chair adjourned the meeting.