



# Meeting Minutes

Prepared by Li Song, Kristen Cetin

## TC 7.5 General Meeting

6/25/2024

3:30:00 PM– 6:00:00 PM Eastern Time (ET)

JW Marriott, White River E (1)

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Schedule for TC 7.5 Meetings, Summer 2024:

Time in CT

Committee	Date	Start	End	Location	Chair
Enabling Technologies	6/23/2024	1:30 PM	2:15 PM	JW Marriott, 305(3)	Mike Galler
Bldg. Operations & Dynamics	6/23/2024	2:15 PM	3:00 PM		Donghun Kim
Fault Detection & Diagnostics	6/23/2024	3:00 PM	3:45 PM		Liping Wang
Smart Grid	6/23/2024	3:45 PM	4:30 PM		Greg Pavlak
Honors and Awards*	6/23/2024	4:45 PM	5:15 PM		Carol Lomonaco
Handbook	6/23/2024	5:15 PM	6:00 PM		Greg Pavlak
Research	6/24/2024	4:45 PM	6:00 PM	JW Marriott, 203(2)	Joe Zhou
Program	6/24/2024	6:00 PM	6:45 PM		Mike Brambley
Main TC	6/25/2024	3:30 PM	6:00 PM	JW Marriott, White River E(1)	Li Song

\*The meeting is not shown on the ASHRAE schedule.

Committee	Link	Password
Enabling Technologies	MS Teams Meeting ID: 263 502 461 362 <a href="#">Click here to join the meeting</a>	qp7Tuz
BOD		
FDD		
Smart Grid		
Honors and Awards		
Handbook		
Program	MS Teams Meeting ID: 251 785 136 666 <a href="#">Click here to join the meeting</a>	3DSFLT
Research		

- Welcome (Li Song).  
Signin Sheet:
- Roll Call and Introductions. Determination of quorum.
  - Current voting members (ending month):  
Mike Galler (June 2025), Donghun Kim (June 2025), Carol Lomonaco (June 2025), Greg Pavlak (June 2025), Li Song (June 2025), Zheng O’Neill (June 2026), Kristen Cetin (June 2026), Michael Brambley (June 2027), David Yuill (June 2027).

X	Mike Galler
	Donghun Kim
X	Carol Lomonaco
X	Greg Pavlak
X	Li Song

X	Zheng O’Neill
X	Kristen Cetin
X	Mike Brambley
X	David Yuill

- Scope  
*TC 7.5 is concerned with the performance and interactions of smart building systems, the impact of smart systems on the total building performance, methods for achieving more intelligent control and operation of building processes, 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.*

ASHRAE Code of Ethics Commitment – Chair

In this and all other ASHRAE meetings, we will act with honesty, fairness, courtesy, competence, integrity and respect for others, and we shall avoid all real or perceived conflicts of interests. (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics>.)

- Changes to Agenda?
  - David move, Carol 2<sup>nd</sup> – all approve 8-0-0
- Approve meeting minutes
  - David move, Zheng 2<sup>nd</sup>, no discussion, all approve 8-0-0
- Announcements: TC chair breakfast updates
  - CIS Code interaction subcommittee- A subcommittee of ASHRAE Standards Committee
    - Signup volunteer link
    - Emily Toto
    - Staff liaison provides representation at code hearings
    - Members check proposals for consistency
    - Subject to copyright approvals by ASHRAE Director of Pubs (if needed)
  - TAC updates
  - Center of Excellence Building Decarbonization (CEBD)
    - Updates for special projects
    - Out of 26 projects, team picked the ones they think are priorities

- Will identify partners, and funding requirements and will look for ASHRAE members to provide input and suggestions – for next phase of the task force
- 
- Global Technical Interactions Committees formed on July 1 st , 2023
  - GTIC shall be responsible for harnessing the technical resources of ASHRAE to influence international standards and maximize the global impacts of ASHRAE standards and other technical work products on the practice of HVAC&R and the built environment. The GTIC is trying to facilitate information exchange and coordination between ASHRAE TCs and U.S. TAGs with a similar scope of interest. ISO - Established in 1947, the International Organization for Standardization (ISO) is a worldwide federation of national standards bodies from more than 170 countries. U.S. participation in international standardization activities is through ANSI-accredited Technical Advisory Groups (TAGs). ASHRAE serves as Secretariat for five U.S TAGs:
    - ISO/TC 59/SC 13 Organization and digitization of information about buildings and civil engineering works, including building information modeling (BIM)
    - ISO/TC 86 Refrigeration and air-conditioning
    - ISO/TC 142 Cleaning equipment for air and other gases
    - ISO/TC 163 Thermal performance and energy use in the build environment
    - ISO/TC 205 Building environment design
- Residential Building Committee updates
  - We are looking for speakers we can help nominate as DL's on residential topics – We would be happy to attend your committee meetings to cover this topic in person
  - Nominate someone for the Residential Buildings Service Award – Due Oct 1
    - If interested you can email Li Song (current chair) and she can connect you with RBC chair.
  - Let us know how we can partner with your TC to increase the awareness of residential topics throughout ASHRAE
- RAC update
- Subject Matter Expert Program (SME) under Government Affair is looking for testimonials

## 7. Liaison Reports:

- Section Head (Money Khana)
- CEC (Kristen Cetin)
  - If anyone interested in joining CEC we will have some openings this coming cycle
  - Record # of abstracts submitted for Orlando for abstracts
  - Research/Academic networking sessions – will try to continue moving forward – please participate
  - Looking for more ways to engage with students – graduate/undergraduate to support programming that supports students – if you're interested in
- TC 1.4 (Chariti Young)
  - Brainstorming meeting
  - Will publish revised handbook chapter
  - Will publish new version of guideline 13
  - 4 program for this meeting, will have new program chair upcoming
  - A few research projects that 7.5 is cosponsoring that have updates
  - Have an RTAR draft that 7.5 might be interested in cosponsoring

- TC 1.5 (Parastoo Delgoshaei)
    - Have 1 RP and active workstatement
    - 2 programs co-sponsored for this conference
    - Discussed ideas for digital twin, generative AI, and application of SPC
  - SPC 223P
    - Currently addressing comment received
    - Next will be public review
    - If interested in joining biweekly meeting please see Parastoo
  - TC 7.3 (Josh Gemmel)
    - Education committee working on train the trainer course focused on those who have to train building operators
    - Participated in 5 sessions this conference
    - Will some sessions for upcoming conference
    - Handbook subcommittee – responsible for chapter 38 and 40 – will be updating for 2027 cycle, with major update on estimating service life on equipment (based on request from various people to update this)
    - Standard 180 – currently toward the end of update cycle
    - Guideline 32 – currently looking for anyone who would be interested in helping because having difficulty getting participants that are actively involved
  - TC7.10 (Zheng O’Neill)
    - Had invited talk on thermostat interface standardization
    - Working on energy water nexus guide with TC 2.8
    - Revising chapter in handbook (applications)
    - Working on unsolicited research proposal for updated occupant behavior database (2.0)
    - One ongoing project
    - Working one work statement – 1811
    - Submitted RTAR on occupant behavior in residential buildings
    - New RTAR – occupant behavior for sufficiency
  - *MTG CEA* (Liping Wang)
    - Focuses on resource efficient indoor agriculture
    - Have work statement under revision focused on evaportransportation measurements from plants
    - Thinking about putting chapter in ASHRAE handbook that collaborates with other TCs – the controls of this environment is related to 7.5 (is very critical)
  - *MTG EBO*
    - There is a meeting on Friday at 2:00 pm if anyone is interested
    - <https://moffitt.zoom.us/j/98589045409>
  - *TC 1.9/1.10* (A new liaison is needed) – no update
8. Research (Joe Zhou) –
- Research chair breakfast
    - Natasha will be chair (from this TC)
    - Resource promotion – 2.5 million per year (raised for research)
    - RTARs – 3 reviewed; Work statements – 7
    - 20 GIAs awarded (out of 67)
    - New PI award – went to Purdue
    - 2023-2024 – 5.6 million in expenditures
    - Next round of proposal submissions will be in September
    - ASHRAE Strategic plan is used by RAC to determine where to fund projects
    - Creating videos on RTARs – can be used as a tool to help with new members wanting to work on research proposal writing (there is also an older version that has all the correct information its just a bit longer)
    - There will be a new RTAR web-based tool to use for writing these – August 15
  - 1 new project sponsored by 7.5
    - Xu Han – received award (UK) – will start July 11

- RP 1661, RP 1756, and SP Grid interactive buildings – all completed (see Joe’s meeting minutes for more details)
  - Active work statements
    - 1809, 1875, 1927, 1964 (see Joe’s meeting minutes for more details)
    - 1964 – will be a project to be bid on in september
  - Active RTARs
    - Several active RTAR – 8 total in the process of developing drafts
    - 7 new RTAR ideas – 3 related to FDD, and 4 related to smart grid
  - Smart grid application guide
    - Will not update anything this year but potentially in the next 4 years
  - Cybersecurity survey
    - Mike will send a link for everyone to collect feedback
9. Fault Detection and Diagnosis Subcommittee Report (Liping Wang)
- See Liping’s notes for most details
  - If any of the topics listed here are of interest, reach out to Liping and she can help connect you
    - Alarm management
    - Assessment of FDD in guideline 36
    - Opensource FDD platform (resubmission)
    - Data-driven FDD
    - Smart thermostat data for FDD in residential buildings
    - Refrigerant leak detection
    - AI learning for FDD
  - WS and RTARs
    - 1 RTAR approved but looking for someone to lead
    - RTAR draft – extend FDD to community level
    - A few other new ideas (Heat pumps, VRF)
10. Enabling Technologies Subcommittee (Mike Galler)
- Three new topics for programs
  - Cybersecurity survey - looking for participants
    - (two parts to the survey):
    - Part 1: <https://www.surveymonkey.com/r/2JW6W89>
    - Part 2 : <https://www.surveymonkey.com/r/7KY57ZP>
11. Smart Grid Subcommittee (Greg Pavlak)
- New RTAR ideas
    - Grid interactive control sequencing – anyone else interested contact Greg
    - Load pumps on heat pumps/hybrid systems in cold climates – something utilities want to know; potentially cofounding because have enough clients interested in this
  - Program ideas
    - 3 ideas for Orlando
    - MPC for DSM – three speakers already
    - Detecting physical and virtual faults – several speakers already
    - Forum on understanding what tools designers are using when designing buildings for microgrids
    - 90 minute session held this morning on boptest/hopper – would like to collaborate on proposing a session on this for the next session
12. Buildings Operations Dynamics Subcommittee (Donghun Kim)
- 3 new program ideas
    - Optimal control beyond HVAC
  - 1 work statement
    - One was a WS but should be submitted for PTAR
13. Program (Mike Brambley)
- Thank organizers and speakers for 5 sessions that we sponsored
  - Cosponsorship is important but needs to be approved. Please consider this before adding another TC to a proposal

14. Handbook (Greg Pavlak)
    - Two chapters due mid-2026
    - Have a good number of people helping but can always use more.
    - Many steps involved so any one interested can be involved, good way to get started and be active in
    - Li will be new subcommittee chair moving forward – meeting at least 1 every other month
  15. Standards (David Yuill)
    - Discussion/Vote on Standard 207 (2021) – Lab Testing of FDD for Air Economizers
    - 7.5 is cognizant TC for 201 and 207
    - Motion – reaffirm ASHRAE standard 207 – David; 2<sup>nd</sup> by Carol
      - Discussion – three things that can happen – revise, reaffirm (no changes) or withdraw
      - Reason reaffirm because it was just published in 2021 and has been reviewed for adherence to ANSI rules for units and language and it is ok (review is on basecamp)
      - No comments
      - Vote: all voting members in favor of standard 8-0-0 CNV
  16. YEA (Carol / Kristen Cetin)
    - Suggest subcommittee similar to 1.4
    - Can do short session after awards
    - Kristen and Carol can discuss
    - Do we need to vote for new subcommittee? Carol will look into it
  17. Honors and Awards (Carol Lomonaco)
    - 1 member receive DSA (Eric)
    - Several member received Crosby field award (congrats!)
    - 1 fellow – working on
    - 3 DSAs working on
  18. Web Page (Mike Galler)
    - ASHRAE is looking to replace basecamp with something else
  19. Membership (Li Song)
    - After in committee for ~2 years, can upgrade to corresponding member, need to email to be corresponding member
    - Roster change only happens in feb/march when ASHRAE allows to change roster
    - If login to basecamp and cannot see, follow up with Zheng/Mike and we can try to add again; sometime have multiple accounts that need to be merged
  20. Old Business
  21. New Business
- The TC dinner is reserved at Loughmiller's Pub & Eatery (301 W Washington St.) 6:30pm.
22. Adjournment



## Meeting Note

### TC 7.5 Building Operations Dynamics 2:15 PM - 3:00 PM EDT, 6/23/2024 JW Marriott: 305 (3)

Prepared by Donghun Kim

Subcommittee Scope: The Building Operations Dynamics Subcommittee of TC 7.5 is concerned with the dynamic characteristics and interactions of comfort conditions, the active components of HVAC systems, the passive components of HVAC systems, control systems and operation strategies and the building. The committee is concerned with the methods of building system operation which minimize energy used through the consideration of dynamics and interactions. It is also concerned with methods which consider dynamic and interactive characteristics in the design or comfort conditioning systems.

Microsoft Teams: <a href="#">Click here to join the meeting</a>	Or call in (audio only) +1 312-667-7145, 467274889# United States, Chicago Phone Conference ID: 467 274 889#
Meeting ID: 251 785 136 666	
Passcode: L6Nuwp	

## Agenda

5 min	Call to Order	
	Self-introduction, announce the subcommittee scope and other announcements.	
15 min	Program	
	Current meeting status and new ideas proposals	See below for more information
10 min	Update/Discussion of Active project/RTARs/Work Statement	See below for more information
15 min	New ideas and discussions	

### Meeting Summary

- 25+ participants
- 3 new programs discussed, 1 seminar presented
- 1 WS is on-going (WS- 1934), and 1 WS (WS-1934) is an active research project.
- 1 RTAR is under development

## Program Discussion (15 min)

Program	Title	Lead	Previous talks
New	Optimal Control Beyond HVAC	Donghun (Joe)	Tampa: General optimization for more than HVAC for DR and carbon emission? Resilience integration? Beyond HVAC (other DRs) <ul style="list-style-type: none"> <li>- DOE's vision</li> <li>- DOE sponsored demo projects</li> </ul> After Chicago Chicago: Targeting Orland (2025 winter) Potential speakers: Carol - Lighting + etc Mike - water heater, Li Song - Donghun - EV+ PV+ HVAC Zheng : PV +Battery +HP + Water IND <ul style="list-style-type: none"> <li>- Target: Orlando</li> </ul>
New	Portfolios of grid responding technologies for clear environment: field evaluations	Donghun	IND <ul style="list-style-type: none"> <li>- Reuse of previous</li> <li>- Target: Orlando</li> </ul>
Presented	Resource-efficient future: Indoor Agricultural Control	Linping	Chicago : Plant and animal environment IND: Presented in Indianapolis, Four speakers
New	Life cycle analysis related to CEA, Green house, indoor house	Linging	IND: <ul style="list-style-type: none"> <li>- Target: Orlando</li> <li>- Carol suggesting COF (college of fellow) to participate and/or provide speaker</li> </ul>

## Research Proposals Discussions (10 min)

Research	Title	Lead	Previous talks (~ Feb/2020, Orlando)
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WS (Work Statement)	WS-1809: Updating reference guide for dynamic models of HVAC equipment	Heejin Cho	<p>Send out to RAC before the RTAR rules changed PTAR (Publication TAR).  Co-Sponsored by 1.4  Has been reviewed by all voting members.  1/15/2019 – Approved by all.  RAC provided comments back to the author  Orlando: no updates from Heejin Cho.  Zheng will follow up with Heejin Li and Zheng iterated with Heejin and Virtual Conf (Austin): Zheng will follow up with Heejin.  Chicago: WS was revised and waiting for response  Phoenix: revision was completed.  Vote on the main meeting this Wed.  Las Vegas: Submitted last year (Aug), received feedback from RAC.  Toronto: RAC asked to move to PTAR. contacted the Heejin, no response yet  Atlanta: no response yet from Heejin</p> <ol style="list-style-type: none"> <li>1. Does the old version (1998) still contain valid and useful information?</li> <li>2. Are updates necessary?</li> <li>3. Can TC 7.5 support?</li> </ol> <p>Joe will contact Heejin  Tampa: Joe will follow up Heejin for Converting to PTAR  <b>Chicago : no update</b>  <b>Joe: no update —&gt; potentially finding another person who can lead</b></p>
WS-1934 1934-TRP	A Survey Study on the Development and Application of Data-driven Model Predictive Control for Buildings	Jin, Zheng, Helia, Joe	<p>Vote (Aug 15, 2021): 6-0-0-5 (CNV)  Submitted in Aug 2021.  Working on the WS with a goal to submit the WS by March 15<sup>th</sup>.  Atlanta: WS was submitted to RAC after Toronto meeting  Tampa: RAC conditionally approved. Asked for revision. Revision was submitted, and will get updated.  Chicago: bided, and PES is finalizing a winner  IND: It is an active research project now. Jose is the chair.</p>

RTAR <sup>1</sup>	Title	Lead	Previous talks (~ Feb/2020, Orlando)
1	Occupancy-Aware Control and Operation of HVAC Systems in Commercial Buildings	Zheng/Li	<p>Vote (06-25, 2019): 6-0-0-5 (CNV)            MTGOBB (12 approve, 0 against, 5 absent, voted on June 22 2021)            Submitted in June 2021            Inquiring the status            Waiting for RAC response            Atlanta: No discussion            Tampa: No discussion            Chicago: TBD, needs discussion on research need            IND: Joe will follow up, potentially drop this off</p>

## Ideas on Hold

Program	Title	Lead	Previous talks
1	What to do with optimal control?	Peter Armstrong/ Joe	<p>Orlando: Peter is not in the meeting. No discussions.            Virtual Conf (Austin): Peter is not in the meeting. Park this idea            Chicago: Zheng will reach out to Peter for this item            Phoenix: David will reach out to Peter for this item            Las Vegas: Zheng will reach out to Peter            Atlanta: no discussion            Tampa: move to Parking</p> <ul style="list-style-type: none"> <li>- Joe proposing a topic: optimal control focused on other applications not just HVAC</li> <li>- Li Song proposing a topic focus on field testing/real applications</li> </ul>

RTAR	Title	Lead	Previous talks (~ Feb/2020, Orlando)
1	How IoT impacts operators	Joe Carol Liping Wang Scott Hackel	<p>Carol working on an outline.            How to quantify impact – Li Song            Dovetailing with enabling technologies.            Update the title            Orlando:</p>

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<sup>1</sup> Research Topic Acceptance Request

			<p>Carol: No updates  Li: should include Residential application. We will need to have another idea/RTAR and Zheng will help Li  Carol: Does the new idea include homes or multi-family homes? Need to consider privacy, multi-stories, etc.  Virtual Conf (Austin): Carol, Joe and Li will have the following meeting.  Chicago: Park this idea  Phoenix: No discussion  Las Vegas: No discussion  Toronto: No discussion  Atlanta: park the idea</p>
2	<p>Link the productivity with occupancy-based control;  Occupant in the loop controls</p>	Ivo Martinac	<p>Ivo Martinac – professor developing idea. The idea but needs to develop the team. Park this idea at this time  Orlando: No updates. Park this idea, Zheng will follow up with Ivo.  Virtual Conf (Austin): No updates. Park this idea.  Chicago: Zheng will follow up with Ivo.  Las Vegas: No discussion  Toronto: No discussion  Atlanta: park this idea</p>



## Agenda

### TC 7.5 Fault Detection and Diagnostics

Sunday, 06/23/2024 @ 3:00 PM– 3:45 PM CST  
JW Marriott, 305 (3)

**Prepared by Liping Wang**

**Subcommittee Scope:** explore and develop technologies to detect and diagnose common faults in both commercial and residential buildings. The scope of this subcommittee includes (a) identifying and sponsoring research projects to develop new FDD technologies, evaluate existing FDD technologies; provide recommendations to building operators and practical engineers, and develop supporting tools for researchers in FDD areas, and b) organizing programs to disseminate research findings and advancements in FDD areas among ASHRAE members.

Agenda:

0:00	<b>Call to Order</b>	
	Self-introduction, announce the subcommittee scope.	
5 mins	<b>Sessions at the current ASHRAE conference</b>	
	<p>Sunday, June 23 8:00 AM – 9:00 AM EDT Workshop 1: Machine Learning Foundations: Intro to Data Science Tools for Building Industry Professionals (Greg Pavlak, Penn State University)</p> <p>Monday, June 24, 2:15 PM- 3:15 PM EDT CIDCO Seminar 4: Real-Time Monitoring and Predictive Analysis (Clemson University's Center for Energy Visualization and Analytics, )</p> <p>Tuesday, June 25, 11:00 AM – 12:30 PM EDT conference Paper Session 14: VRF and Smart Thermostat Performance (Mahroo Eftekhari, Loughborough University)</p>	
	<p><b>2025 ASHRAE winter conference seminar ideas</b></p> <ol style="list-style-type: none"> <li>1. Fundamentals and Applications</li> <li>2. HVAC&amp;R Systems and Equipment</li> <li>3. Refrigeration &amp; Refrigerants</li> <li>4. Energy Storage and Grid Resiliency</li> <li><b>5. Pathways to Building Decarbonization</b></li> <li>6. Artificial Intelligence</li> <li><b>7. Industrialized Construction: Opportunities and Challenges</b></li> <li>8. Ventilation and Indoor Environmental Quality</li> <li><b>9. Future-Proofing the Built Environment</b></li> </ol> <p>August 2, 2024: Program (Seminar, Forum, Workshop, Debate and Panel) Proposals Due</p>	

	<b>Potential Seminar Ideas for 2024 ASHRAE Winter</b>	
10 mins	Automated Alarm Management: DDC alarm management?  Segment the alarm information into useful pieces. The building operator has to go through all the alarms. Make a presentation to collect information to make an RTAR is a goal. TC1.4: program will be the co-host. Carol already has two speakers. (submitted to Chicago 2024 and will resubmit for Maybe Orlando, FL 2025)	Carol Lomonaco (Chair), Kim Barker, Jason, Chirag
	Assessment of FDD in Guideline 36 Target for 2025 (Joe will follow up and provide an update)	Joe Zhou (Chair), Steve Taylor
	Open-source FDD (software) platform Submitted 2024 Annual	Anthony Demattos, Chirag Parikh (Chair), Natasha Milesi-Ferretti, Yan Chen
	Data-driven based FDD (Annex 81) Plan to submit this program to Orlando, FL 2025	Zheng O'Neill, Jin Wen (Chair)
	Use smart thermostat data for FDD in residential buildings, Orlando FL 2025	Li Song, Lian Zhang, Burak Gunay, Donghun Kim
	A2L Refrigerant Leak Detection, maybe Orlando FL 2025	Li Song (Chair), Srinivas Katipamula
	<b>New program ideas?</b>	
	Use ASHRAE 223P for FDD application in different buildings	Parastoo Delgoshaei, Zheng O'Neill, Jin Wen, Xuechen Lei
	AI for smart buildings; General AI/Transfer Learning for FDD	Carol, David Yuill, Jin Wen, Liping Wang, Himanshu Sharma
	<b>Update/Discussion of Active project/RTARs/Work Statement</b>	
	Evaluation of the Usability of ASHRAE Standard 207 Co-sponsor TC 7.9, Maybe TC 1.4 Revised based on comments from REC and Liaison. Look for volunteers to respond to the comments David Yuill, Srinivas Katipamula, Liping Wang Looking for a principal author for work statement Accepted RTAR, ready to move to work statement, looking for a champion to lead the work statement and submit the work statement in May, 2024.	Led by John House David Shipley
	RTAR in the draft:  Evaluating the impacts of interactive faults from microgrids and buildings on grid and building system performance at community scales.	Liping Wang
	<b>Research Ideas</b>	

	User's experiences with FDD? How do users respond to the alarms, correct or false?	Austin Rodgers, PNNL Laura Towsley (laura.towsley@rycom.com). Scott West Eric Yang
	FDD for low global warming potential (GWP) heat pumps: evaluate existing FDD methods for heat pumps/variable speed compressors Donghun plans to lead the proposal.	Donghun Kim, David Yuill, Li Song
	FDD for variable refrigerant flow (VRF) systems	Donghun Kim, Yifeng Hu
	<b>New ideas and discussions</b>	
	AI for FDD	



## Meeting Minutes

### TC 7.5 Smart Grid Subcommittee (Hybrid)

Sunday, June 23, 2024 | 3:45 pm - 4:30 pm EDT

**Meeting Room:** JW Marriott, 305 (3)

**Virtual Meeting Info:**

**Join on your computer, mobile app or room device**

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**Subcommittee Scope:** This subcommittee will explore and develop ideas and research work statements to improve the building and utility interactions (and more specifically the electric grid). The research will focus on developing enabling technologies for seamless interaction of smart building components and utilities and other building services. An important aspect of this work is to identify the information that is necessary to support smart building technologies, and to identify the requirements of communication protocols to support the exchange of this information between different building services buildings and utilities, between multiple buildings, with outside service providers.

The importance of a stable and reliable electric power grid to life and the economy in the 21st century has been underscored by two major events over the last decade: a major black out on the east coast of North America and wildly varying electricity prices in California during an attempt at restructuring the electricity marketplace. In response to these events many organizations have started research activities to find ways to modernize the grid. However, there are significant gaps in the research activities, especially as they relate to buildings. Since buildings consume over 70% of the electric in the U.S., they have to part of the solution to modernize the grid. ASHRAE has traditionally developed technologies, standards, and guidelines for buildings. Therefore, this subcommittee can play a major role in continuing this effort.

**Agenda:**

0:00	<b>Call to Order</b>	
5 min	Introductions, announce the subcommittee scope	
20 min	<b>RTAR Ideas and Updates</b>	
5 min	<b>Relevant sessions at current ASHRAE conference</b>	
15 min	<b>Annual ASHRAE conference seminar ideas</b>	
Adjourn		

## Detailed Agenda

### Call to Order

- Read scope
- New members – name – affiliation, new member
- Sign In Sheet:

### Update/Discussion of RTARs/Work Statement ideas

Grid-Interactive Building Control Sequences: Program, Session, PTAR, RTAR? Current guidance is so high-level that it is not implementable.

- We don't have any sequences for the strategies that we are talking about (re: buildings/smart grid)
- Practitioners will be looking for that kind of guidance.
- Collaborate with 1.4?
- Still need to solve communication and integration problems first
- How do we actually do this?
- Research project needed to gather sequences? Goal: gather pieces needed to go from guide to guideline.
  - Could start with modeling or survey of existing projects?
  - Diverse teams that include battery manufacturers, EV's, etc.
  - Important to consider scope of grid services for desired sequences
  - Load shapes are a big driver (narrow down to specific building types)
  - Availability of data streams as inputs to sequences
  - Sequences should be practically adaptive (e.g., trim and respond)
  - TC 6.7 support PV system topics
- Indianapolis Update:
  - Greg will lead with help from Michael P, Joe Zhou, Zufen, Xing, Scott West
  - Potentially connect with new TG/MTG on Grid-Interaction for Decarb.

### Guidance on smart building equipment / IoT – **Carol Lomonaco, Scott Hackel**

- what are you getting, functionality, products?
- what program functions are necessary to work in different environments?
- Carol – can reach out to one of the consultants that works in this area, has a good feel of this (has looked at some of this already) some people say wont allow the use of IoT because of lack of security/authentication, but maybe this isn't the case, seems to be a wide range; people don't understand these features/components – what are the deficiencies?
- Scott - also interested and had ideas on this topic
- Kristen & Carol can discuss
- (No report in Toronto)
- Focus on selection?
- (Indianapolis or Orlando PTAR, Herve also contribute. )
- Indianapolis Update:
  - Huge scope, potentially start by narrowing and defining audience (MEP designers, integrators?)
  - Joe Z. can follow up with Scott
  - Requirements on data sheets?

### Linking building modeling to grid modeling (Donghun K)

- Some existing efforts
- End user of this work would be policy recommendations for ISOs

- How to validate models?
- Tampa Discussion:
  - o difficult to connect topic to ASHRAE users
  - o Was a seminar in Atlanta on the topic.
  - o Building response is important for the grid.
  - o Connected communities might be hook for getting ASHRAE to think about modeling buildings and grid.
- Indianapolis:
  - o Grid modeling not really ASHRAE scope
  - o Work with IEEE?
  - o Connect with new DTG/MTG.Utility
  - o Forum or debate to understand tools? (Carol can lead submission but needs help with questions, Orlando. )

Smart Grid Application Guide – need to update? Is it still relevant?

- Likely too soon to update. Maybe in 4 years.
- TC 7.5 Smart Grid may lead.

New Ideas:

- o Load Shapes from Heat Pumps and Hybrid Systems in Cold Climates (Dave Shipley, Kristen Cetin, someone from Slipstream)
  - Clients wanting to know how various heat pump technologies (e.g., cold climate, hybrid, etc.) influence load shape.
  - Typical? 8760 load shapes
  - Organizations may co-fund
  - Residential only to limit scope

### **RTAR/PTAR Parking Lot:**

Development of models for better peak load predictions (some discussion at research subcommittee already) – James McNeill

- City-scale model validation for predicting demand response - some models exist
- Need an evaluation of the state of the art, perhaps useful for new city planning
- Need some more research on demand response capacity prediction
- Existing software – GridLabD – developed to designing rate cases
- (No report in Toronto)
- (No report in Atlanta)
- Discussion in Tampa: Good idea, but maybe outside of ASHRAE research scope/abilities

Related: Energy demand prediction of multiple building scale

Instantaneous voltage and current load from buildings

- Specifically related to embedding DR in control sequences
- Inverter-based equipment / power quality / two-way power flow
- Direct DC wiring with AC in comb.
- May be more of an IEEE topic than ASHRAE

WS 1885 ASHRAE Design and Integration of PV in the Built Environment Guide - **Costa Kapsis, Jim Liedel- leidel@oakland.edu; [costa.kapsis@uwaterloo.ca](mailto:costa.kapsis@uwaterloo.ca)** (from winter 2021)

- Draft is posted in Basecamp
- Looking for people to review and provide comments
- Comments:
  - o careful with “guide vs guideline”, suggestion to talk to research liason for Section 7
  - o Glenn – interested in reviewing
  - o PTAR process created after
  - o seeking co-sponsorship (TC 6.7 initial sponsor)
- (No report in Toronto)
- (No report in Atlanta)
- Tampa discussion: No lead, put in parking lot

### Relevant Sessions at current ASHARE conference

- Seminar 6: Present and Future Weather for Design and Resilience (Sunday 9:45 AM)
- Seminar 17: How can Connected Communities Support Global Legislative Decarbonization and Electrification Targets Cost-Effectively and at Scale? (Sunday 1:30 PM)
- CIDCO Seminar 2: Energy and Carbon Reduction Modelling and Analysis (Monday 11 AM)
- Seminar 33: Mitigating Electrification Pitfalls with Thermally Driven Heat Pumps (Tuesday 8 AM)
- Conference Paper Session 12: Case Studies in Building Retrofit and Energy Storage (Tuesday 9:45 AM)
- Seminar 42: Changing World for Electric and Thermal Batteries (Tuesday 3:15 PM)
- Seminar 44: HVAC IoT Edge Controllers Are Here: What can we do with them and what are the benefits? (Wednesday 8 AM)
- CIDCO Panel 8: The Importance of Optimizing Distributed Energy Resources in Grid Interactive Buildings for Carbon Neutrality (Wednesday 9:45 AM)
- Seminar 50: Navigating Building Electrification, Demand Management and Renewable Energy Programs Working Together: Promises and Pitfalls (Wednesday 11 AM)

### ASHRAE Seminar Ideas

- Deadlines & Tracks
  - o Track 2: HVAC&R Systems and Equipment
  - o Track 4: Energy Storage and Grid Resiliency
  - o Track 5: Pathways to Building Decarbonization
  - o Track 6: Artificial Intelligence
  - o Track 9: Future-Proofing the Built Environment

### Debate, Panel, Seminar, Forum, Workshop, and Debate proposals due: Aug 2

- Previous/Current Ideas
  - o Connected buildings for decarbonization – **Srinivas K. (lead)**,
    - There are 10 connected community projects (just getting started)
    - Chicago: No report.
    - Completed in Indianapolis
  - o Donghun K. – “California Flex Hub”: technologies for load flex.
    - Chicago: Submitted for Indianapolis?
  - o Panel discussion on grid interactive buildings (Joe Zhou organize for Annual 2024)

- Needs panelists for discussion “Grid-Interactive Efficient Buildings: Are we there yet?”
  - Not Orlando, maybe Phoenix
- Hydro Quebec/Concordia Flexibility Index (Nouanegue Herve Frank)
  - Submitted for Orlando
- Study impact of building and transportation electrification (EV chargers) – (Helia Z. lead)
  - Chicago: No report.
  - Indy: No report.
- Cybersecurity & Smart Grid - **Carol Lomonaco** (from Summer 2021)
  - Please email Carol if interested in contributing - [carol.lomonaco@jci.com](mailto:carol.lomonaco@jci.com)
  - **Zheng O’Neill / Jin Wen** – can help, can discuss – have DOE project on this area
    - Present literature review results. Focused on GEB.
    - Present simulation framework/HIL testbed for cyber-attack evaluation.
  - **Eric Yang** – help connect with Ron Bernstein at TC 1.4 - has good amount of work on this and info in guide spec (primary author) – more at system level
  - *(from previous meeting)* **Glenn Remington** – has contacts who could speak
  - potential collaboration with TC 1.5
  - David Holmberg/Ron Bernstein/Doe GWAC as speakers
  - New chapter in G13 on cybersecurity (timely for Atlanta)
  - OpenADR 2.0
  - (Tampa update) Carol still interested.
  - (Chicago update) Carol still interested.
  - Zheng Oneill & Jin Wen (CYDRES)
    - Lit review, HIL testing, FDD (physical and cyber fault)
- Other topics/ideas
  - Smart products for residential and commercial buildings (Li Song)
    - talk with residential TC – net zero building committee
    - Maybe Phoenix
  - Smart grid and building envelope interaction (from 4.4) - as an energy storage feature – (Jami L. will lead)
    - How building envelope can impact or interplay with smart grid contributions from buildings
    - Dynamic facades
    - Suggestion to follow up with NBI
    - TC 6.7 – Veronique Delisle
    - Indy: No discussion or champion.
  - Utility Grid Battery Control Strategies and Impacts on O&M & LCA (From Atlanta 2019) – Future meeting
    - Webinar on NAESCO on battery storage in ESPC project. Could look for speakers.
    - Large scale batteries
    - Indy: No discussion or champion.

New Ideas Proposed in Chicago:

- Open ADR 3.0 (Joe can contact one)
  - Deferred to Phoenix
- Advanced load management program including EV charging integrated with building load and others (Li S.)
  - Case study?
  - Deferred to Phoenix
- Advanced/optimal controls: What is available today? Seminar or forum (Donghun)
- Building-to-Grid Integration for resiliency during heat waves/winter storms (Zheng O'Neill)
  - Prof. Scott Bucking as potential speaker
  - Duplicate. Delete
- Program in GEB implementation for decarbonization (Scott H.)
  - Carbon signals, sources, etc.
  - Regional differences
  - Delete. Similar seminar offered in Indianapolis

New Ideas:

- Forum on cyber security?

**Seminar/Program Ideas Parking Lot:**

- Follow up seminar/panel to *Grid-interactive buildings, what's impact on efficiency?* (from *Summer 2021* by Mike Brambley) – **Eric Yang** (Chicago: move to parking lot)
  - Suggestion to plan for a follow up seminar or panel on this topic.
  - Eric will follow up with Mike
  - Potential series related to GEB



## TC 7.5 Honors & Awards 2024 Annual Indianapolis, IN Subcommittee Meeting Minutes

4:30 PM to 5:15 PM EDT, Sunday, June 23, 2024

Location: JW Marriott, 305 (3)

Hybrid ASHRAE Teams Meeting

Prepared by: Carol Lomonaco-Subcommittee Chair

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1. The TC 7.5 Honors & Awards Subcommittee Meeting was called to order at 4:33 PM EDT by Carol Lomonaco.
  - a. Introductions by everyone in the room or on the Teams call were not done because we just did the TC 7.5 Smart Grid Subcommittee introductions. There was a Google Docs sign-in sheet linked to a QR code for TC 7.5 meetings asked to sign in for the Honors and Awards meeting.
  - b. The power point slide deck was shared with everyone on the TC 7.5's Basecamp site by Carol Lomonaco on Sunday, June 23, 2024, within the hour before the subcommittee meeting. The slides went over the honors and awards that a TC would manage, and ones that the ASHRAE main Honors and Awards Committee would be responsible for.
2. TC 7.5 Honors & Awards Recipients:
  - a. Distinguished Service Award (DSA) was presented during the Plenary Session at Indianapolis, IN 2024 Annual Meeting by TC 7.5 for Eric Yang
3. TC 7.5 Honors and Awards Subcommittee Meeting topics discussed:
  - a. The subcommittee current members are as follows for July 1, 2024, through June 30, 2025:  
Carol Lomonaco (Subcommittee Chair), Natascha Milesi Ferretti, Mike Brambley, and Liping Wang
  - b. The objectives for the Honors and Awards TC 7.5 subcommittee are:  
"Give TC 7.5 members an update on this subcommittee's work, and how many Fellow Awards, Distinguished Service Award (DSA) and Exceptional Service Award (ESA) nominations have been made thus far." Note: at the 2024 ASHRAE Indianapolis Annual Plenary ASHRAE had awarded "Distinguished 50-Year Members Awards" and "Distinguished 75-Year Members Awards".
  - c. The current goals for the subcommittee are to complete the nominations by the ASHRAE Honors and Awards published deadlines for two DSA, two Fellow, and two ESA nominees. The request is to let Carol Lomonaco know that you are going to nominate someone or yourself. Also, we try to have each nomination reviewed before sending it to the ASHRAE Honors and Awards committee.
  - d. The group discussed the ASHRAE RAC "Service to ASHRAE Research" Award in length. Jin Wen will send several names of TC 7.5 members who have contributed to ASHRAE Work statements (WS), PMS committee members, etc. It was discussed that in the last several years no nominations have been made to RAC for this award. The goal of TC 7.5 would be to nominate one candidate for this RAC award. Note: this award is from RAC and not from ASHRAE Honors and Awards Committee.
  - e. Carol mentioned that ASHRAE members can visit the ASHRAE Honors & Awards website to find the requirements for each of the following Honors and Awards: Fellow, Distinguished Service Award (DSA) and Exceptional Service Award (ESA) nominations.
  - f. Two Fellow nominations are being worked on and will be submitted ASAP, two DSA nominations are being worked on, and there are no ESA nominations at this time for TC 7.5 members.
4. The TC 7.5 Honors & Awards Subcommittee Meeting was adjourned at 5:09 PM EDT.

# TC 7.5 Handbook Subcommittee Meeting Minutes

June 23, 2024 (Sunday) 5:15 PM to 6:00 PM EDT

Hybrid Meeting

**Meeting Room:** JW Marriott, 305 (3)

**Web meeting info:**

**Join on your computer, mobile app or room device**

[Click here to join the meeting](#)

Meeting ID: 263 502 461 362

Passcode: qp7Tuz

[Download Teams](#) | [Join on the web](#)

**Or call in (audio only)**

+1 312-667-7145,, 287485189# United States, Chicago

Phone Conference ID: 287 485 189#

[Find a local number](#) | [Reset PIN](#)

1. **Call to order / Introductions** (3 min)
2. **Report from TC 7.5 handbook Chair (Greg Pavlak)** (10 min)
  - 2.1. Progress since last ASHRAE meeting
    - Li Song will take over as handbook subcommittee chair.
    - Reviewer/Reviser Status: [Link to Google Sheet](#)

2.2. Schedule for the next version:

2027 HVAC Applications		2023			2024			2025			2026			2027					
		Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul
Review	Current HB received (June 1)		June 1																
	TC selects HB subcom and chair					Feb 1													
Revise	Review current HB for changes					Jul 1													
	Decide extent of and outline revisions					Jul 1													
Approve	Seek and appoint reviser(s)							Feb 1											
	Revise chapter(s)											Feb 1							
Edit & Produce	Send revised chapter to TC for review																		
	TC approves chapter																		
	Send chapter to HBC liaison																		
Edit & Produce	HQ sends chpt. proof to TC contact																		
	HB sent to printer (April 1)																		
	HB mailed (May 15)																		

- Ch 43 – revisions and approvals due to Society staff no later than **3/1/2026**.
- Ch 63 – revisions and approvals due to Society staff no later than **7/31/2026**.

### 2.3. Handbook Online

- Keep in mind that online version can also contain additional materials (spreadsheets, calculators, graphics, etc.) that supplement and enhance the handbook content
- Updates to handbook online can be brought forward at any time. Follows similar process to normal cycle. TC must approve changes via vote.
- ASHRAE publication timeline may vary depending on work load from normal cycle.

### 3. Review Previous List of Edits and Discuss Revision Scope/Timeline (~15 min)

- [Chapter 63 Review Notes](#)
- [Chapter 63 Meeting Activity](#)
- Chapter 43 Sharepoint / Slack Channel? (Zheng O'Neill)
- Update 43 with comments for Peter A.

### 4. Continue Discussion: Potential New Chapters (time permitting)

#### 4.1. Control-oriented modeling (Andreas A.)

- New chapter or guide on thermal RC networks?
- Potentially put case studies in Chapter 63 or Chapter 43?
- New MPC chapter?
- Fundamentals on link between design and operations (co-design)
- Outline key objectives and decided how to package
- MTG on designing with controls in mind
- Presentation slides and draft document for preliminary discussion and feedback attached:
- Indy Discussion:
  - Include new case studies or new section in Chap 43?
  - Check with 4.7
  - Annex 81 Task B

#### 4.2. Chapter (or subsection) smart building control platform (Joe Z.)

Move/integrate with Multi-TC chapter on Optimization.  
Still needed to address multi-energy/component system

#### 4.3. Multi-TC chapter on Optimization and Controls (Peter A.)

- TC 1.13 is more on the algorithms, but already working on chapter (outline approved)
- Would it be focused on theory or HVAC controls?
- Material beyond HVAC controls is needed?
- Are the algorithms suitable for controls/operations/smart-buildings?

- **Indy:** TC 1.13 will organize subcommittee meeting for Orlando? (Zhenning Li, Vikrant C. Aute)

**5. Open Comments and Discussion** (time permitting)

5.1. Should be subsection in Chapter 63 provide highlight of smart building control methods. Co-write optimization strategy with TC 1.13. Topic “Monitoring and Control for Smart Buildings”

5.2. Handbook chapters should be more practitioner/industry-focused?

**6. Next handbook subcommittee meeting** (2 min)

2025 ASHRAE Winter Meeting (Orlando)

**7. Adjourn**

**ASHRAE TC 7.5: Smart Building Systems Research Subcommittee Meeting**  
**Monday, 06/24/2024**

**4:45 PM– 6:00PM (EDT) JW Marriott Indianapolis, 203 (2)**

Virtual Meeting Link (Microsoft Teams):

**Join on your computer, mobile app or room device**

[Click here to join the meeting](#)

Meeting ID: 251 785 136 666

Passcode: 3DSFLT

[Download Teams](#) | [Join on the web](#)

**Or call in (audio only)**

[+1 312-667-7145,,370947426#](#) United States, Chicago

Phone Conference ID: 370 947 426#

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## Meeting Minutes

1. Roll Call and Introduction
2. Sign in sheet:  
[https://docs.google.com/spreadsheets/d/1efuzAy21QW6EwYhAWzdVt\\_uuAM0CYGsvhNIIlMoL9Q9U/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1efuzAy21QW6EwYhAWzdVt_uuAM0CYGsvhNIIlMoL9Q9U/edit?usp=sharing)
3. Announcements/recap of the research subcommittee chair meeting (Joe Z.)
  - Current RAC chair Bill Murphy will roll off after Wednesday. Next Chair: Natascha M.!
  - Resource promotion: on track for \$2.5M this year.
  - RTAR & WS reviewed: 3 RTARs 2 accepted/1 returned; 7 work statements 4 accepted/3 returned
  - Current RPS Chair: Jin Wen will become RAC Vice Chair soon.
  - Current RAS Chair Stefan Elbel. Jim Bogart will become RAS Chair soon.
  - RAC liaisons: Srinivas, Zheng, Jin from TC 7.5
  - 5 awards: Grant-in-aid 20 out of 67 applications, new PI (Riley Barta Purdue), Service to ASHRAE research, innovation research, Homer Addams award
  - 2023-24: \$5.6m total RAC expenditure
  - 6 TRP next round / September. Up to \$350k RAC can approve
  - PTAR: TC will fill out PTAR forms and submit them to MORTS. Publication committee review. RAC invite TC or groups to develop publications. PTAR should be biddable.
  - ASHRAE research strategic plan (2021): Guide RTAR development. Used by RAC to justify using ASHRAE fund
  - New PMS members – training is required. Training will be recorded by August and available on the ASHRAE website.
  - Service to ASHRAE research award: deadline 9/1. Criteria on ASHRAE website not under honors and award, but research. Notes: current RAC members cannot be nominated for conflict of interest.
  - RAC testing the RTAR web tool for submitting RTARs. Beta test soon. TC 7.5 members if you are interested in Beta testing – both experienced and new – please contact Natascha M. Targeting August 15- date to roll out.

#### 4. Current TC 7.5 research project updates

##### 3.1 Ongoing research projects updates

- a) 1934-TRP: A Survey Study on the Development and Application of Data-driven Model Predictive Control for Buildings. PMS Chair: José Candanedo. New research project just started. PI: Xu Han (The Univ. of Kansas). Initial PMS meeting is scheduled on July 11, 2024.
- b) RP 1661: Development and validation of dynamic models for the evaluation of chilled water system control strategies in the ASHRAE handbook. The project is closed. Final report is available at ASHRAE.
- c) RP-1756: Evaluation of low-cost particulate sensors for building. The project is closed. Final report is available at ASHRAE.
- d) Special publication: Guide for Designing and Operating Grid-interactive Buildings for Decarbonization. The Guide is published and is available for purchase. [https://store accuristech.com/standards/grid-interactive-buildings-for-decarbonization-design-and-operation-resource-guide?product\\_id=2574822](https://store accuristech.com/standards/grid-interactive-buildings-for-decarbonization-design-and-operation-resource-guide?product_id=2574822). ASHRAE is forming a new utility-related Multi-Task Group MTG (now called DTG.)

##### 3.2 Active work statements updates

- a) WS-1809: Updating Reference Guide for Dynamic Models of HVAC Equipment. Primary Author: Heejin Cho. Move to WS for PTAR. New lead: Jie Cai (Univ. of Oklahoma), Zheng O'Neill support.
- b) WS-1875: Develop cost and performance indices to evaluate effectiveness of virtual sensors in HVAC applications. Primary author: Li Song. A version has been sent to RL 7 in 2023. Joe check with the new RL 7.
- c) WS-1927: HVAC Equipment Health KPIs. Primary author: Ian Bonadeo. TC 7.5 Voted 4/2024: 5 yes, 1 no, two absent, chair no vote. Provided some comments to TC 1.4. TC 1.4 research chair Amada update: TC 1.4 submitted it to RAC. Returned with comments. Srinivas: Make sure 'No' vote needs justification. Should not mention 'health' in RTAR.
- d) WS-1964: Warmup and Setback Research. Primary author: Hwakong Cheng. This will be bid out in September 2024 as a new TRP.

##### 3.3 Active RTARs updates

- a) RTAR - Occupancy-Aware Control and Operation of HVAC Systems in Commercial Buildings. A version exists but is lost in the process of RL 7 review. Joe follows up with the new RL 7.
- b) RTAR - How does remote work environment impact on residential building load profiles and HVAC operations? Residential building committee published

an article on ASHRAE journal. Li Song and Dave Shipley still like to work on this.

- c) RTAR-1942 Evaluation of the Usability of ASHRAE Standard 207. New champion Yifeng Hu (ORNL) will lead it. Dave Shipley could help.
  - d) RTAR - AFDD for Smart and Connected Communities. Li: re-shaping the scope? Ask for others comments / feedback. Joe suggests it may be too early for its real applications. Recommends working with the new utility-related MTG. Maybe change to a survey type of project. Liping Wang still like to put this RTAR on the list.
  - e) RTAR - Development of models for better peak load predictions for building clusters/neighborhood/city. New lead: James McNeill (Edo)
  - f) Occupant-Centric Demand-Side Management for Residential Buildings. M Primary author: Mohamed Ouf; TC 7.10 lead this. RAC has not seen it. Joe checks with the new RL7.
  - g) RTAR- Resilience in smart buildings. TC 2.10 lead this. Carol will reach out to Jason DeGraw at ORNL.
  - h) Assessment of energy savings of “smart” web-based connected thermostats in new and existing single and multi-family dwellings for inclusion in SSPC90.2. Primary author: Li Song. This is led by the residential building committee. Li Song has the draft. Will reach out to see if TC 7.5 can lead (if no progress from residential building committee).
5. TC 7.5 research new RTAR ideas and topics
- a. FDD
    - i. FDD for GWP heat pumps. Donghun Kim.
    - ii. FDD for variable-speed compressors. Donghun Kim.
    - iii. FDD for VRF systems. Donghun Kim.
  - b. Smart Grid
    - i. GEB control sequences. Greg P., Joe Z., others
    - ii. Guidance on smart building equipment / system integration. Carol L., Joe Z.
    - iii. Linking building modeling to grid modeling. Donghun Kim.
    - iv. Load (shape) impacts from heat pumps and hybrid systems – cold climate only? Residential only?. David Shipley leads, Joe finds help.
6. New Business
- a. ASHRAE's Smart Grid Application Guide and ASHRAE Grid-Interactive Buildings for Decarbonization Guide. TC 7.5 will be the cognizant TC to

oversee future publication updates for the Smart Grid Application Guide. 4-year cycle. Maybe in 3 years we need to prepare a PTAR.

- b. Cybersecurity survey. Mike Galler will send the link to basecamp for TC 7.5 members to fill out the survey.

7. Adjourn

6:01

## **Attachment**

### **ASHRAE TC 7.5: Smart Building Systems Research RTAR/Work Statement Status**

**June 24, 2024**

- Active TC 7.5 sponsored Project: 1
- Co-sponsored Projects: 3 (just completed)
- Active WS: 5 (including 2 co-sponsorship)
- Active RTAR with Draft: 8 (including 3 co-sponsorship)
- ~~Parking lot RTARs/ideas: 24~~

### Sponsored Projects: 1

#	TC	Project	Contributors/PI	Status
1	TC 7.5	<b>1934-TRP</b> <b>A Survey Study on the Development and Application of Data-driven Model Predictive Control for Buildings</b>	PMS: Jose, Joe, Zheng, Michael, Donghun.	<ul style="list-style-type: none"><li>• 2024 Indianapolis: Research project started. PI: Xu Han (The Univ. of Kansas). PMS Chair: Jose.</li><li>• Update: initial meeting is scheduled on July 11, 2024.</li></ul>

### Co-sponsored Projects: 3

#		Project	Contributors/PI	Status
1	TC 4.7 (Energy Calculations)	<p style="color: cyan;">RP 1661</p> <p><b>Development and validation of dynamic models for the evaluation of chilled water system control strategies in the ASHRAE handbook</b></p>	PMS Liaison: Li Song	<p>Co-sponsoring with TC – 4.7 and 1.4            WS is returned with comments. Wangda will provide updated WS for TC review during Orlando.            STL: the TC voted Yes and submitted to RAC. RAC conditional approved.            Las Vegas – Selected a bidder. Miami is the winner            Long Beach – contract is being signed. Project starts on August 1<sup>st</sup>. Wangda is the PI (will be at Boulder)            Chicago: The project has begun, and the PMS met with the contractor. Task 1 is complete. Conference call is complete.            Houston: The PI gave a report on the progress.            Atlanta Update by Wangda: PMS meeting was on Sunday. Identified 9 sequences rather than 3 sequences. Large scale simulation and debugging is ongoing. 12- month extension is requested.            Orlando: the 2<sup>nd</sup> 12-month extension is proposed by the PI and main sponsoring TC.            2021 virtual: LI: moving on well PMS in Oct 2020. Wrap the project in May 2021. Next PMS meeting is scheduled in Feb. 2021.            2022 Las Vegas: NCE to May 2022.            2022 Toronto: PMS meet in Feb and May 2022. First rough draft report was sent to the PMS in April. The PMS is waiting for the second version.            2023 Atlanta: PI submitted the final report in July 2022.            2023 Tampa: PMS approved final report. TC 4.7 believed voted to approve too. But TC 1.4. TC 7.5 needs to vote to approve. Amanda will send the final report. Joe will distribute the report to voting members. Do we need to vote?  <span style="background-color: yellow;">2024 Chicago: the project is closed. TC 7.5 does not need to vote.</span></p>

#		Project	Contributors/PI	Status
2	TC 2.4 (Particulate Air Contaminants and Particulate Contaminant Removal Equipment)	<b>RP-1756</b> <b>Evaluation of low-cost particulate sensors for building</b>	Brent Stephens (2.4) 7.5 PMS: Glenn Remington and Liping Wang	<p>ORL: – need co-authorship too – against lab-grade equipment to review their performances...</p> <p>STL: the TC voted YES and submitted to RAC. No feedback yet.</p> <p>Las Vegas – resubmit a WS. Need 1-2 PES volunteers</p> <p>Long Beach – PES met and is selecting winner.</p> <p>Chicago: Project was awarded to Jordan Clark at Ohio State University, and has commenced. There are some initial adjustments to scope requested.</p> <p>Houston: The PMS had their second meeting.</p> <p>Update: Li will follow up with Remington or Li Ping Wang for an update before the main TC meeting.</p> <p>Kansas City update: The Pis made decent progress on the project. They have submitted an STBE paper currently under revision.</p> <p>Orlando: need update from Glen/Liping. Wrap up the final report, which is due in March 2020. PMS chair is satisfied with the report.</p> <p>Glen: no update in the summer virtual meeting.</p> <p>2021 virtual: Liping: Liping received update in January 2021. Liping will provide an update offline.</p> <p>2022 Las Vegas: Liping: The project is completed. The team is finalizing the report.</p> <p>2022 Toronto: Final report is waiting for the PMS approval.</p> <p>2023 Atlanta: No update.</p> <p><b>2023 Tampa: PMS approved the final report. TC. 2.4 approved? Liping will check with Brent. Joe should get the final report and distribute the report to voting members. Do we need to vote?</b></p> <p><b>2024 Chicago: Closed the project. Final report is available.</b></p>
3	SG (Co-sponsor TSBD)	<b>Work Statement for Publication</b> <b>Guide for Designing and Operating Grid-interactive Buildings for Decarbonization</b>	Co-sponsorship (ASHRAE Building Decarbonization Task Force)  Katherine Hammack, Scott Hackel	<p>2022 Toronto change work statement to PTAR. Ask for co-sponsorship, will have an email ballot.</p> <p>2023 Atlanta: TC electronic vote on 8/4/2022: 10 out of 11 voted YES. 1 no response. ASHRAE issued bids – NBI won and will write the Guide. Expected the Guide will be completed at the summer meeting.</p> <p>2023 Tampa: 100% draft is done. Report should be available Oct. 2023. PMS needs to approve first.</p> <p><b>2024 Chicago: The Guide is published and is available for purchase. <a href="https://store accuristech.com/standards/grid-interactive-buildings-for-decarbonization-design-and-operation-resource-guide?product_id=2574822">https://store accuristech.com/standards/grid-interactive-buildings-for-decarbonization-design-and-operation-resource-guide?product_id=2574822</a>.</b></p> <p><b>ASHRAE is forming a new utility-related Multi-Task Group MTG (now called DTG.)</b></p>

### Active Work Statements: 4 (2 co-sponsorship)

#		Project	Contributors/PI	Status
1	BOD	<b>WS-1809</b> <b>Updating Reference Guide for Dynamic Models of HVAC Equipment</b>	Heejin Cho;	2024 Chicago: No update. Need to convert to PTAR. Call for a new champion. Make it a research project? Valuable for graduate students. 2024 Indianapolis: Jie Cai lead, Zheng O'Neill support.
2	ET	<b>WS-1875</b> <b>Develop cost and performance indices to evaluate effectiveness of virtual sensors in HVAC applications</b>	Li Song, Zufeng Wang, Jianli Chen	Voted in Atlanta; Submitted for RAC to review. RAC accepted with comments. ORL – WS in preparation STL – WS in preparation Las Vegas – no update Long Beach – no update Chicago: there is still an interest in submitting a WS. Houston: Li will submit WS to RAC by August 15. Update in Kansas City: 1783 Orlando: Li is Still working on it. Summer 2020: Li will get it done by December 2020. 2021 virtual: Li is still working on it. 2022 Las Vegas: Zheng to follow up with Li 2022 Toronto: no progress. Try to have a draft by 12/15/2022. 2023 Atlanta: No progress. 2023 Tampa: Draft 1 available. Li Song provided background and needs for this research. Brief discussion. Voted at the main meeting: 8-1-0 CNV. Sent the clean version to research liaison on July 15. 2024 Chicago: Joe follows up with RL7. 2024 Indianapolis: Joe follows up with NEW RL 7.
3	BOD (Co-sponsor TC 1.4)	<b>WS-1927</b> <b>HVAC Equipment Health KPIs</b>	Ian Bonadeo	2022 Toronto: RAC approved the RTAR, now moved to WS. 2023 Atlanta: Ian: "still working on the work statement. We expect to have something around Q2 of this year for review." 2023 Tampa: No update. Joe will contact the author. Amanda followed up - Ian's goal is to submit the WS in December. Backup is May of 2024. 2024 Chicago: Draft version is available on basecamp. We need to vote for co-sponsorship at this meeting. 3 PES member from TC 1.4. Call for a PES member from TC 7.5. 2024 Indianapolis: Voted 4/2024: 5 yes, 1 no, two absent, chair no vote. Provided some comments. Shared results with TC 1.4. Amada update: TC 1.4 submitted it to RAC. Returned with comments. Srinivas: Make sure 'No' vote needs justification. Should not mention 'health'.
4	BOD (Co-sponsor TC 1.4)	<b>WS-1964</b> <b>Warmup and Setback Research</b>	Hwakong Cheng	July, 2023 – new WS (bypass RTAR) from TC 1.4. Post the WS on basecamp for review and later vote to approve co-sponsorship before August 1. Seeking interested bidders, PES, and PMS member: 2024 Chicago: TC 7.5 voted in August 2023 to co-sponsor this work statement (8-0-0 CNV). Revised WS sent to RAC by TC 1.4 in Dec. 2023. WS has been approved. TRP bid out soon (Spring, 2024). Call for new PES members for this TRP from TC 7.5. 2024 Indianapolis: Push to September for bidding.

**Active RTARs: 8 (including 3 co-sponsorship)**

#		Project	Contributors/PI	Status
1	BOD	<p><b>RTAR</b>  <b>Occupancy-Aware Control and Operation of HVAC Systems in Commercial Buildings</b></p>	<p>Rich Hackner                       Li Song</p>	<p>STL: An RTAR is prepared by Li and will be discussed in the committee meeting for comments. Rich will lead on WS if the RTAR is accepted. Need inputs to improve the RTAR.                      Two volunteers: James Sweeney and Gary Shamshoian.                      Las Vegas: In development                      Long Beach: In development                      Chicago: No update.                      Houston: Li plans to submit to RAC by August 15. The chair of MTG.OBB has agreed to cosponsor. We hope to vote at the main meeting to submit the RTAR.                      Atlanta update by Song: Li will upload the RTAR on basecamp and circulate among the TC.                      Kansas City update: Li will add the co-sponsorship to the RTAR and send it Jin for voting on Tuesday.                      Orlando: The RTAT was submitted to Bill Murphy                      Update after Orlando: Bill advised that we did not get vote from co-sponsor committee (MTGOBB) and he would provide feedback to this RTAR regardless but haven't heard back yet.                      Summer 2020: Research chair in STCOBB will be reached for voting.</p> <p>2021 virtual: waiting for MTG. OBB vote                      2022 Las Vegas. Vote (06-25, 2019): 6-0-0-5 (CNV)                      MTGOBB (12 approve, 0 against, 5 absent, voted on June 22, 2021). RTAR submitted in June 2021.</p> <p>2022 Toronto: waiting for the RAC comments. Zheng followed up will Bill and Jim 8/20/22.                      2023 Atlanta: No discussion.                      2023 Tampa: There is no record at RAC for this RTAR and no RTAR# assigned. This might be missed during the transition from previous Research Liaison to the current Research Liaison. Li - not sure about the need for this research. We might need to re-vote and re-submit.                      2024 Chicago:                      2024 Indianapolis: Joe follows up with the new RL 7.</p>
2	BOD	<p><b>RTAR</b>  <b>How does remote work environment impact on residential building load profiles and HVAC operations?</b></p>	<p>Li Song</p>	<p>2022 Las Vegas: New in LAS                      2022 Toronto: Kristen, Li is working with Residential Building Committee (RBC) on an ASHRAE news/journal (residential news brief), then will work on this RTAR. Keep this idea.                      2023 Atlanta; Li is working with Residential Building Committee to develop a brief issue for "impact of working from you" and prepared a seminar in the winter conference in Atlanta. Will decide how to prepare the RTAR after the feedback.                      2023 Tampa: No discussion.                      2024 Chicago:                      2024 Indianapolis: residential committee publish an article on ASHRAE journal. Not sure about a research project. Li, Dave S. to work on this.</p>

3	FDD	<p><b>RTAR-1942</b>  <b>Evaluation of the Usability of ASHRAE Standard 207</b></p>	John House SP 207P	<p>Kansas City update: David Shipley initiated the topic and will send the draft of the RTAT to Li for improvement in the TC.</p> <p>Orlando: Liping will coordinate with everyone since she is the subcommittee chair. Kim will lead this RTAR and Mike Brambley and Ahmed (ahmed.abdel-salam@rycom.com) will assist. Chirag Parikh is interested in seeing the document and see how he can help.</p> <p>2021 virtual: Liping: John House will take over to lead this effort. RTAR is not submitted yet.</p> <p>2022 Las Vegas  TC 7.9 co-sponsorship  Budget increased from 100K to 150K 24 m instead of 12 m.  Editorial changes. Will be voted in this meeting  Submitted to the RAC on March 15th.</p> <p>2022 Toronto: Received RAC comments. John is revising the RTAR.</p> <p>2023 Atlanta: A revised version is complete and sent to Region VII liaison in Jan. 2023. No discussion at this RAC meeting.</p> <p>2023 Tampa: Research liaison provided feedback. Need another version. Need a new lead. Dave Shipley can help. Joe will provide RAC liaison comments to Srinivas, Mike Brambley, David Yuill and Dave Shipley to see if they can provide information/reference/suggested changes. If RTAR is approved, WS needs to be developed and submitted to RAC before May 15, 2024.</p> <p>2024 Chicago: RTAR was accept with comments for further development into a work statement (WS) provided that the approval comment(s) are addressed to the satisfaction of RL. Need to submit the work statement to the RL for approval. The work statement requires a current TC vote and co-sponsoring committee votes. "The first draft of the work statement should be submitted to RAC no later than May 15, 2024, or it will be dropped from display on the Society's Research Implementation Plan." Srinivas cannot lead since he is on RAC.</p> <p>2024 Indianapolis: Need a new champion to draft the WS. Or it will be dropped. Yifeng will lead it. Dave. S. help.</p>
4	FDD	<p><b>RTAR</b>  <b>AFDD for Smart and Connected Communities</b> based on holistic considerations of microgrids and buildings (Phase 1: modeling)</p>	Liping Wang	<p>2023 Tampa: New Idea. Lead author (Liping Wang) provided the background and needs for the research. Brief discussion. Did not vote at this meeting as some members question the need for the research.</p> <p>2024 Chicago: Revised RTAR was email voted in August 2023 (1 yes, 1 abstain, 1 no response, 5 against). There were some major concerns with this RTAR.</p> <p>2024 Indianapolis: Li: re-shaping the scope? Ask for others comments / feedback. Working with utility-related MTG? Change to a survey type of project?</p>
5	SG	<p><b>RTAR</b>  <b>Development of models for better peak load</b></p>	Michael Bobker Kristen Cetin	<p>Long Beach – initiated the idea  Houston: No update</p>

		<b>predictions for building clusters/neighborhood/city</b>	Li Song (localized weather impact)	<p>The Atlanta update by Kristen: still interested in working on. Helps are welcome. Helia Zandi with Oak Ridge will help Kristen work on it. TC4.1 is interested in co-sponsorship. Kansas City update: Kristen is still interested in working on it. Positive to develop a RTAR. Bing Dong and Zhe Wang volunteered to help.</p> <p>Orlando: still interested. Chicago.</p> <p>Summer 2020: Xiaohui recommended to connect with DOE new connected community solicitation. The funding from ASHRAE might not be sufficient for the study unless we focus on model development. We may wait to see if there is value to do something complimentary. Kristen and Michael will monitor and update the committee.</p> <p>2021 virtual: Kristen” No updates”, call for new lead author. Joe; is submitting a similar idea for DOE BENEFIT program.</p> <p>2022 Las Vegas: No discussions</p> <p>2022 Toronto: Li Song is still interested and would like to include weather impact.</p> <p>2023 Atlanta: No update.</p> <p>2023 Tampa: No discussion.</p> <p>2024 Chicago:</p> <p>2024 Indianapolis: James M. leads.</p>
6	Co-spons or (TC 7.10)	<b>RTAR Occupant-Centric Demand-Side Management for Residential Buildings</b>	Mohamed Ouf; Liam O’Brian	<p>2023 Tampa: Seeking RTAR co-sponsorship. New TC 7.10 occupant-centric controls is leading the RTAR sponsoring TC. Lead authors (Mohamed Ouf. and Liam O’Brian) provided the background and needs for the research. Brief discussion. Voted to approve co-sponsorship but not the RTAR. Need to revise/update then vote (Joe, Li).</p> <p>2024 Chicago: In August 2023, TC 7.5 voted via email to co-sponsor an updated/revised RTAR (7 Yes, 0 No, 0 abstention, and 2 no response.) The author will work with TC 7.10 for the next step.</p> <p>2024 Indianapolis: RAC has not seen it. Joe follows up with new RL 7.</p>
7	Co-Spons or (TC 2.10)	<b>RTAR Resilience in smart buildings</b>	Carol Lomonaco	<p>New idea in 2022 Toronto meeting.</p> <p>2023 Atlanta: No progress, but Carol is seeking co-sponsorship from TC 2.10 and the RES.MTG.</p> <p>2023 Tampa: No discussion.</p> <p>2024 Chicago:</p> <p>2024 Indianapolis: Carol will reach out to Jason DeGraw ORNL.</p>

8	Co-Sponsor	<b>RTAR</b> <b>Assessment of energy savings of “smart” web-based connected thermostats in new and existing single and multi-family dwellings for inclusion in SSPC90.2</b>	Li Song	2021 virtual: Li Song is following up 2022 Las Vegas: No discussions 2022 Toronto: Li to follow up. 2023 Atlanta: An RTAR draft is almost finished but the lead RTAR writer has not been responding to Li. 2023 Tampa: No discussion 2024 Chicago: 2024 Indianapolis: led by residential building committee. Li has the draft. Will reach out to see if TC 7.5 can lead.
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## 7.5 Smart Building Systems Program Subcommittee Meeting

2024 Annual Conference, Indianapolis, Indiana  
Monday, June 24 | 6:00 pm – 6:45 pm | JW Marriott, Room 203 (2)

<p>Microsoft Teams: <a href="#">Click here to join the meeting</a>  Meeting ID: 251 785 136 666  Passcode: L6Nuwp  <a href="#">Download Teams</a>   <a href="#">Join on the web</a></p>	<p>Or call in (audio only)  +1 312-667-7145,,370947426#  United States, Chicago  Phone Conference ID: 370 947 426#  <a href="#">Find a local number</a>   <a href="#">Reset PIN</a></p>
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### Agenda

1. Call to order
2. Self-introductions and sign in (5 minutes)
3. Indianapolis TC 7.5 sponsored and co-sponsored sessions (10 minutes)
4. Indianapolis conference sessions and statistics (5 minutes)
5. Program tracks for Orlando Winter Conference (5 minutes)
6. TC 7.5 proposed program sessions for Orlando (10 minutes)
7. Program ideas for Phoenix and beyond (10 minutes)

### Supporting Materials

#### Indianapolis TC 7.5 sponsored and co-sponsored sessions

##### Sponsored

Sponsoring Committee	Program Time	Session Chair	Session Title	Co-Sponsoring Committees
7.5 Smart Building Systems	Workshop 1 Sunday, 6/23 8:00 – 9:00 AM	Greg Pavlak	Machine Learning Foundations: Intro to Data Science Tools for Building Industry Professionals	No co-sponsor
7.5 Smart Building Systems	Seminar 9 Sunday, 6/23 11:00 AM – 12:30 PM	Kevin Muldoon	Achieve Resource Efficiency in Controlled Environment Agriculture	TC 2.2 Plant and Animal Environment. MTG.CEA
7.5 Smart Building Systems	Seminar 17 Sunday, 6/23 1:30 PM – 3:00 PM	Srinivas Katipamula	How Can Connected Communities Support Global Legislative Decarbonization and Electrification Targets Cost-Effectively and at Scale?	No co-sponsor
7.5 Smart Building Systems	Seminar 44 Wednesday, 6/26 8:00 – 9:00 AM	Greg Pavlak	HVAC IoT Edge Controllers Are Here: What Can We Do with Them and What Are the Benefits?	TC 1.4 Control Theory and Application
7.5 Smart Building Systems	Seminar 50 LIVESTREAM Wednesday, 6/26 11:00 AM – 12:30 PM	Michael Brambley	Navigating Building Electrification, Demand Management, and Renewable Energy Programs: Promises and Pitfalls	No co-s

## Co-sponsored

Sponsoring Committee	Program Time	Session Chair	Session Title	Co-Sponsoring Committees
None				7.5 Smart Building Systems

## Indianapolis Conference Session Statistics

Session Type	Proposals Submitted	Proposals Scheduled
Debate		
Forum		
Panel		
Seminar		
Workshop		
Total		
Total with Paper Sessions		

## Program tracks for Orlando Winter Conference

1. Fundamentals and Applications - Track Chair: **Erik Sanchez** | [esanchez@prmech.com](mailto:esanchez@prmech.com)
2. HVAC&R Systems and Equipment - Track Chair: **Li Song** | [lsong@ou.edu](mailto:lsong@ou.edu)
3. Refrigeration and Refrigerants - Track Chair: **Jon Cohen** | [joncohen1@gmail.com](mailto:joncohen1@gmail.com)
4. Energy Storage and Grid Resiliency - Track Chair: **Robin Bryant** | [RBryant@bandiflorida.com](mailto:RBryant@bandiflorida.com)
5. Pathways to Building Decarbonization - Track Chair: **Joe Chow** | [joe.ashrae@gmail.com](mailto:joe.ashrae@gmail.com)
6. Artificial Intelligence - Track Chair: **Suzanne LeViseur** | [slevisur@haddadeng.com](mailto:slevisur@haddadeng.com)
7. Industrialized Construction – Opportunities and Challenges - Track Chair: **Stephanie Mages** | [s\\_mages@yahoo.com](mailto:s_mages@yahoo.com)
8. Ventilation and Indoor Environmental Quality - Track Chair: **Ehab Mamdouh** | [ehab.mamdouh@ipecc-eg.net](mailto:ehab.mamdouh@ipecc-eg.net)
9. Future-Proofing the Built Environment - Track Chair: **Joshua Vasudevan** | [joshuavasudevan2011@gmail.com](mailto:joshuavasudevan2011@gmail.com)

In addition to the tracks above, papers and programs that address Cold Climates are appropriate and encouraged.

**TC 7.5 proposed program sessions for Orlando – Review, Update, Add New Sessions**

Type	Session Chair / Speakers	Proposed Title	Status	Updates
Seminar	Xin Jin	Affordable Residential Electrification for Supporting Decarbonization Under Electrical Panel Constraints	Resubmit?	Orlando Winter 2025?
Seminar	Donghun Kim	Accelerating Decarbonization with the California Load Flexibility Research and Deployment Hub	Resubmit? No	Leveraged as part of new seminar: "Portfolios of grid responding technologies for clear environment: field evaluations "

**Enabling Technologies – Mike Galler, Chair**

Type	Session Chair / Speakers	Proposed Title	Status	Updates
		David Yuill – Sensor for refrigerant charge level. Novel uses for sensors.		
	Li Song	Ground source heat pumps with district heating and cooling.		
	Joe Zhou	MPC for AI track in Orlando. Broader than MPC.	3 speakers	

FDD - Liping Wang

Sponsoring Committee	Program Time	Session Chair	Session Title	Co-Sponsoring Committees
	Orlando		Pathway to Building decarbonization	
	Orlando	Carol	"Automated alarm management" and process for eliminating repetitive alarms. Not much FDD.	Carol to content potential (2) speakers
		Joe Zhou	FDD	Joe will let Liping know later
		Liping	Open source FDD Platform	Not selected for this conference. Have 3 or 4 speakers.
		Jin Wen	Data driven based FDD -	Targetting for Orlando. Have speakers. Annex 81. Several speakers.
		Li Song	Using Smart T-stat data for FDD in res. buildings	For Orlando – Li to see if still have speakers
		Li Song	A2L Refrig. Leak Detection	Email for potential speakers. Try for Orlando but delay if needed.
<b>New Ideas</b>		See chat	Using ASHRAE 223P for FDD application in different buildings.	3 or 4 speakers. Parastoo Delgoshaei, Zheng O’Neill, Jin Wen, Xuechen Lei
		Carol Lomonaco	AI and transfer learning for FDD	David Yuill (may be protecting IP), Jin Jin Wen student, Liping

Building Operation Dynamics – Donghun Kim, Chair

Type	Session Chair / Speakers	Proposed Title	Status	Updates
Seminar	Dong Hun	Optimal Control Beyond HVAC	New	Targeting Orland (2025 winter) Potential speakers: Joe or Carol - Lighting + etc (Carol to find speaker on BACnet) Mike - water heater (PNNL colleagues) Li Song – LBNL now Donghun - EV+ PV+ HVAC Zheng : PV +Battery +HP + Water Heating Target: Orlando
Seminar	Dong Hun	Portfolios of grid responding technologies for clear environment: field evaluations	New	INDY <ul style="list-style-type: none"> <li>Reuse of previous seminar proposal (CalFLEX)</li> </ul> Target: Orlando
	Liping	Life cycle analysis related to indoor agriculture	New	<ul style="list-style-type: none"> <li>Target: Orlando</li> <li>Carol suggesting COF (college of fellow) to participate and/or provide speaker and co-sponsor</li> </ul>

Sponsoring Committee	Program Time	Session Chair	Session Title	Co-Sponsoring Committees
		Mike Galller Carol L – wants questions from others	Forum on building-grid integration modeling	
		Joe Zhou	Guidance on integrating building energy system controls	Phoenix
		Herve Frank Nouanegue	Model predictive control for demand side management	<b>Four speakers. Three firm. Mike needs to follow up with Frank about submission process. Orlando</b>
		Zheng and Jin	Securing Grid-interactive Efficient Buildings (GEB) through Cyber Defense and Resilient System (CYDRES)	Two or three speakers
		Li Song	Smart appliances	Phoenix
		Joe Zhou	Open ADR	Phoenix
		Li Song	Load management with EV Charging.	Phoenix

Handbook – Greg Pavlik

Type	Session Chair / Speakers	Proposed Title	Status	Updates

Parking Lot Ideas for Orlando and later

Type	Session Chair / Speakers	Proposed Title	Status	Updates
Seminar	Kristen Cetin/Zheng O'Neill	Smart products for residential and commercial buildings		In the future
Seminar	Donghun Kim	Smart Grid – Building Envelope Interaction/Dynamic Facades		In the future (Donghun to follow up)
Seminar/Debate	Carol Lomonaco	IOT Security		
Seminar	Edward Tsui	Best practice of monitoring and instrumentation		Glenn Remington
Seminar	Eric Yang	Battery Control Strategies and its impact to life cycle cost	Christie Kjellman, Carol, Glenn Remington, Srinivas Katipamula	
Seminar	Peter Armstrong	What to do with optimal control?		
Seminar	Andreas Atheneites	Model accuracy impact study on model predictive control		BOD sc. David/Andreas
TBD	TBD	What data the lawyer would like to know –needs to define scope	In future	
Seminar	Peter Armstrong & Li Song	Building optimal / predictive control	For Future	
Seminar, co-sponsor TC 7.9	Li Song & Carol Lomonaco	How BAS can Enhance Existing Building Commissioning	For Future	
Seminar	Armstrong	Edge computing, Cloud Analytics, and On-Premises Systems – Architectures for Smart Building Systems	For future	

Seminar	Nick Gayeski / Speakers from Armstrong	Smart Transducers with Embedded Diagnostics	For future	
Seminar	Kristin Heinemeier / Kristin & Jon Douglas, someone from TC 7.9?	Fault Detection and Retro- commissioning: Where is the Line and Does it Matter?	For future	
Workshop	Kristin Heinemeier	Lab Methods for verifying that FDD tools for RTUs really work: Will Standard 207 really work?	For future	
Seminar	Chris Kinney/Michael Munroe/Glenn Remington	FDD and Clouds?	For future	

