



**AGENDA**  
**ASHRAE TC 4.7 ENERGY CALCULATIONS – MAIN MEETING**  
**GEORGE R. BROWN CONVENTION CENTER, LEVEL 3,**  
**ROOM 370 A, B, D, E**  
**HOUSTON, TX**  
**TUESDAY, JUNE 26 2018, 6:00 PM – 8:30 PM**

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“Commitment to the ASHRAE Code of Ethics: 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 interest. (See full Code of Ethics: <https://www.ashrae.org/about-ashrae/ashrae-code-of-ethics> )”

1. Roll call and introductions (5 minutes) Abushakra
2. Accept agenda & approve minutes of previous meeting (10 minutes) Abushakra
3. Announcements/Liaisons (5 minutes) Abushakra
  - Program Submittals:
    - o Talk to the Track Chair before submitting
    - o Conform to one of the Tracks
    - o Physics vs new technology: interest of audience (declining programs). Show new technology used.
    - o Propose a Track to CEC, for Atlanta (Winter 2019) and Beyond.
  - 2019 ASHRAE Winter Conference in Atlanta:
    - o Conference Papers are due July 9
    - o Seminar, Forum, Debate, Panel and Workshop proposals are due August 3
  - 2019 ASHRAE Annual Conference in Kansas City:
    - o Conference Paper Abstracts, Technical Papers and Paper Session requests due August 21
  - 125th History in a couple of years (Historical Committee). TC’s can organize or sponsor a program session for the 2019-2020 meetings.
  - Emergency Rosters can be submitted anytime during the year so that changes in subcommittees or other positions can be made official on the rosters (instead of waiting till after July 1).
  - Review the TC1.4 (Controls Fundamentals and Applications) proposal for a new Special Publication (document distributed to TC4.7 memberships) and forward your comments to Chris Balbach, incoming TC4.7 Chair.
  - Nominating ASHRAE Fellows: Haberl
4. Membership (5 minutes) Abushakra
  - By the Manual of Procedures, the maximum number of voting members on a committee is 18. However, the drawback of a high number of VM would be the quorum in meetings.
  - We currently have 11 Voting Members.
  - Neil Kruis will roll off on July 1 2018
  - Joe Huang and Antony Fontanini will roll on, on July 1 2018
  - Hoyjin Kim will be promoted to Voting Member on July 1 2018
  - This will bring the Voting Members count to 13, on July 1 2018
  - Bass Abushakra will chair the Program Subcommittee for 1-year term (2018-2019).
  - Provisional Corresponding Members should go to: [Onebuilding.org](http://Onebuilding.org), to Subscribe to the TC4.7 Mailing List (TC47-L). Once subscribed, PCM, will stay up-to-date with the TC4.7 business.
5. Subcommittee reports
  - 5.1 Multiscale Building Energy Modeling (10 minutes) Judkoff
  - 5.2 Data-Driven Modeling (10 minutes) Fontanini
  - 5.3 Simulation and Component Models (10 minutes) Huang
  - 5.4 Research (15 minutes) Haberl
  - 5.4.1 Research Projects
    - Upcoming RTAR’s and WS’s submission to RAC dates:
      - o August 15: for RAC Fall meeting consideration
      - o December 15: for RAC Winter meeting consideration
    - Completed Projects
      - o Update of any.
    - Awarded Projects
      - o 1741-RP, “Understanding Fan Coil Components and how they relate to Energy Consumption and Energy Modeling”; Responsible Committee: TC 5.3 (Room Air Distribution); Co-sponsoring TCs: TC 4.7. Neal Kruis is a member of the

- PMSC. RP was awarded to ULA-Lafayette and Baylor. One of the outcomes is a Standard 205 representation of FCU's. Latest update (Neal Kruis).
  - 1661-RP Development of Near-Optimal Control Sequence for Chiller Plants with Water Side Economizer using Dynamic Models (PES Report). Project moved from U. of Miami to Colorado. PMSC met on Sunday afternoon for about an hour and a half with a full attendance from the reviewers and the contractor was resent with two people. They reviewed progress to date including reviewing an updated report sent to PMSC late last year. They reviewed the technical issues surrounding the 5 tasks identified for their project. The contractor is making good progress. Their next review of the report is scheduled for late February 2018, with a conference call / web meeting right after this. Latest update (Keith Cockerham).
- Approved RTAR
  - 1763-RTAR, "Development of an Improved Inverse Model Toolkit (RP1050) and Diversity Factor Toolkit (RP1093) for Analyzing Bldg Energy Savings from Time Series Data" (RTAR accepted July 29, 2015). Author (Haberl). A WS was written taking into consideration the comments the authors received on the RTAR. Sent to ASHRAE and was added to the draft agenda for the RAC 2018 Spring Meeting for consideration by the RAC Chair for inclusion. Chris Balbach, Ralph Muehleisen, and Tony Fontanini agreed to serve on the PES if the WS is approved.
  - 1816-RTAR, "Reporting the Energy Use and Heat Gain from Imaging Equipment". Responsible Committee: TC 9.6 (Healthcare Facilities); Co-Sponsors: None; Status: Accepted with comments. Developed into a WS. Contact Glenn Friedman ([gfriedman@taylor-engineering.com](mailto:gfriedman@taylor-engineering.com)) if interested in serving on the project evaluation and project monitoring committees once the WS is approved by RAC. Latest update (no update from 9.6 so far).
- Approved WS
  - Update if any.
- Returned WS with Comments
  - 1748-WS, "Assess and Implement Natural and Hybrid Ventilation Models in Whole-Building Energy Simulations - Phase 2". Authors (Huang and Fontanini) DDM Update.
- Rejected RTAR to be Revisited
  - 1813-RTAR, "Development of an Accuracy Test Method for Residential Attic Duct System Simulations in Whole-Building Energy Simulation Programs". (Mini). The RTAR passed vote by 4.7 for resubmittal, and was submitted for the RAC 2018 Spring Meeting.
- WS, RTAR, Requests for Co-sponsorship
  - Update if any.
- New RTAR
  - XXXX-RTAR: Interested DDM members in the Occupancy Modeling, can cooperate with the MTG-OBB. contact Bing Bing Dong ([Bing.Dong@utsa.edu](mailto:Bing.Dong@utsa.edu)) and Burak Gunay [<mailto:burakgunay@cunet.carlton.ca>]
  - XXXX-RTAR "Improved simplified methodology for describing and calculating heat conduction through the ground". McDowell and Kruis. MBEM and SCM had some comments and recommended that it get submitted with those changes. Latest update.
  - XXXX-RTAR "Toolkit for Passive Solar and Whole Building Simulations". The tool will be independent from commercial software; like hvac01, and hvac02 toolkits. How to get to netzero". Lead author is Montana State University. Latest update.
  - XXXX-RTAR "Merged HVAC01, HVAC02, Loads toolkit". Lead author TAMU. Haberl and Muehleisen. Jason Glazer expressed interest in this RTAR and suggested some script languages to be used. Latest update.
  - XXXX-RTAR "Occupancy-based thermostats". Hyojin Kim has some ideas towards a useful RTAR from some recent work done in D.C. Latest update (potential overlap with an approved RTAR by Rob Hitchcock).
  - XXXX-RTAR: "Baseline Modification when a Building Behavior Changes". Carlos B., and Bass A. from DDM, and 2 members of MTG-OBB will write the RTAR. Latest update.

- XXXX RTAR: Better modeling of night time heat exchange. EnergyPlus and DOE2 were both wrong in an LBNL simulation of Flexlab, and the cause is not clear. Talk with Joe or Phil Haves to help develop an RTAR. (SCM subcommittee).
- XXXX-RTAR: Water simulations; cooperation with TC6.6.

5.5 Handbook (10 minutes)

Pruett

5.6 Program (15 minutes)

Cockerham

- Endorsement of Optimization in HVAC&R Track for 2019 (supported by DDM and SCM. Prepare Seminar and Technical Session Papers.
- Houston, June 2018
  1. Sunday 8:00AM – 9:30AM, Seminar 3, New Advances in Simulating Fenestration Systems. Sponsor: 4.7 Energy Calculations. Chair: Jeff Haberl. 3 Seminars with Speakers: Kruis, Barnaby, and Huang.
  2. Sunday 11:00AM – 12:30AM, Seminar 16, Urban-Scale Energy Modeling, Part 8. Sponsors: 1.5 Computer Applications, and 4.7 Energy Calculations. Chair: Joshua New. 3 Seminars with Speakers: Nagpal, Hong, and Cox.
  3. Monday 3:15PM – 4:45PM, Seminar 22, New ASHRAE Standard 209 on Simulation Aided Design for Buildings. Sponsor: 4.7 Energy Calculations, and SPC 209. Chair: Erik Kolderup. 5 Seminars with Speakers: Glazer, Menchaca, Denson, Brophy, and Dunn.
- Atlanta, January 2019, and beyond
  1. Historical Committee (Seminar. Haberl)
  2. Aging Grid and Power Lines Reaching Normal Rating Capacity – Load Growth Projection Modeling (Seminar. DDM Subcom. Abushakra)
  3. New Advances in Simulating Fenestration Systems (Seminar. SCM Subcom. Haberl)
  4. Data Visualization (Seminar. Application Subcom. Balbach)
  5. What does the difference between data driven models and measurements mean? (Seminar. DDM Subcom. Chair)
  6. So you think you're Normal? Many regression models assume normal distributions (Seminar. DDM Subcom. Fontanini)??
  7. How to remove outliers from data before using DDM (Seminar. DDM Subcom. Chair. Potential Speakers: Bass, Chris B., Carlos B., using data from Cornell U)
  8. Surface water heating co with TC 6.6. Chair Jim Lutz ([jdLutz@hotwaterresearch.net](mailto:jdLutz@hotwaterresearch.net)). This is to spur a discussion between modelers and those who use related design systems. How to validate such a model.
  9. Seminar on VRF with TC8.7 (Balbach)
  10. Standard 140 Seminar (Ralph, Ron, Joel)
  11. Airside HVAC Besttest (Ralph)
  12. Other Ideas??

5.7 Historical (5 minutes)

Haberl

- Historical Committee - 125 Anniversary.

5.8 Standards (15 minutes)

Neymark

- SSPC 140 SMOT for Evaluation of Building Energy Analysis Computer Programs
  - Internal Revenue Service Section 179D Tax Deductions – Citation of Std 140
 

Neymark  
Judkoff
- SPC 205 Standard Representation of Performance Simulation Data for HVAC and Other Facility Equipment
 

Barnaby
- SPC 209P Energy Simulation Aided Design
 

Kolderup

5.9 Web Site (5 minutes) (<https://tc0407.ashraetcs.org/>)

New

6. Related activities reports (10 minutes)

SPC 191 Standard for the Efficient Use of Water in Building and Mechanical Systems  
 MTG O&MEE Operations and Maintenance Activities That Impact Energy Efficiency  
 MTG OBB Occupant Behavior in Buildings  
 MTG.BIM Building Information Modeling  
 MTG ACR Air Change Rates (Contact Dennis Knight to join this MTG)  
 TC 2.8 Building Environmental Impacts and Sustainability  
 TC 4.1 Load Calculation Data and Procedures

TC 4.2 Climatic Information  
TC 4.3 Infiltration & Ventilation Requirements  
TC 4.5 Fenestration  
TC 6.5 Radiant Heating and Cooling  
TC 7.5 Smart Building Systems  
TC 7.6 Building Energy Performance  
BuildingSMART (formerly IAI International Alliance for Interoperability)  
IBPSA: USA, Canada, World  
BPI-2400-S-2011 Standardization Qualification of Whole-house Energy Savings Est.  
Guideline 14  
IEA Annex 60 Modelica for Building Simulations  
IEA Annex 66 Occupant Patterns

7. Awards Nomination

2018-2019 Hightower Award: Nominations due to Section head by September 1, 2018

2018-2019 Service to ASHRAE Research Award: Nominations to RAC Liaison by September 1, 2018

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|--|-----------|
| 8. Old Business  | Abushakra |
| 9. New business  | Abushakra |
| - Assigning a Liaison to Std 90.1 (Interpreting Chapter 11 and Appendix G for energy modelers) |           |
| 10. Adjourn  | Abushakra |

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## RESOURCES

### DEADLINES

#### 2019 ASHRAE Winter Conference in Atlanta:

<http://www.ashrae.org/atlanta>

- Conference Papers are due July 9
- Seminar, Forum, Debate, Panel and Workshop proposals are due August 3
- Program notifications go out September 14
- Web site opens for presentation uploads on November 30
- All presentations due online January 4, 2019

#### Atlanta, January 2019 Tracks

2019 Winter Conference Chair is Corey Metzger, [corey.metzger@resourcece.com](mailto:corey.metzger@resourcece.com)

**Track 1:** Systems and Equipment. Joe Firrantello, [jfirrantello@gmail.com](mailto:jfirrantello@gmail.com)

**Track 2:** HVAC& R Fundamentals and Applications. Rick Hermans, [herma015@umn.edu](mailto:herma015@umn.edu)

**Track 3:** Refrigeration Sonya Pouncy, [sonya.pouncy@gmail.com](mailto:sonya.pouncy@gmail.com)

**Track 4:** Construction, Operation and Maintenance of High Performance Systems. Leticia De Oliveira Neves, [leneves@gmail.com](mailto:leneves@gmail.com)

**Track 5:** Common System Issues and Misapplications. Lee Riback, [lee.riback@gmail.com](mailto:lee.riback@gmail.com)

**Track 6:** The Convergence of Comfort, Indoor Air Quality and Energy Efficiency. Ashish Rakheja, [ashish.rakheja@aeonconsultants.in](mailto:ashish.rakheja@aeonconsultants.in)

**Track 7:** Building Integrated Renewables and Natural Systems. Maggie Moninski, [maggie.moninski@gmail.com](mailto:maggie.moninski@gmail.com)

**Track 8:** The Engineer's Role in Architecture. Ashu Gupta, [ashu.energy@gmail.com](mailto:ashu.energy@gmail.com)

#### 2019 ASHRAE Annual Conference in Kansas City:

[www.ashrae.org/kansascity](http://www.ashrae.org/kansascity)

- Conference Paper Abstracts, Technical Papers and Paper Session requests due August 21, 2018
- Conference Papers due November 30, 2018

#### Kansas City, June 2019 Tracks

2019 Annual Conference Chair is Carrie Anne Monplaisir, [carrie.monplaisir@gmail.com](mailto:carrie.monplaisir@gmail.com)

**Track 1:** Systems & Equipment in the Built Environment. Kimberly Pierson, [kdpwildcat@gmail.com](mailto:kdpwildcat@gmail.com)  
**Track 2:** Fundamentals and Applications. Gary Debes, [gary.debes@comcast.net](mailto:gary.debes@comcast.net)  
**Track 3:** Optimization in HVAC&R. Vikrant Aute, [vikrant@umd.edu](mailto:vikrant@umd.edu)  
**Track 4:** Commissioning New & Existing Buildings. Raul Simonetti, [raul.simonetti@carel.com](mailto:raul.simonetti@carel.com)  
**Track 5:** Occupant Health & Safety. Chris Reinders-Caron, [creinders@cannondesign.com](mailto:creinders@cannondesign.com)  
**Track 6:** Modeling Throughout the Building Life Cycle. Nivedita Jadhav, [nivi2307@gmail.com](mailto:nivi2307@gmail.com)  
**Track 7:** Professional Development. Rich Rose, [richr@mticontrols.com](mailto:richr@mticontrols.com)  
**Track 8:** Research Summit. Bing Liu, [bliu@neea.org](mailto:bliu@neea.org)  
**Track 9:** (Mini-Track): Radiant Heating & Cooling Mini-Track. Devin Abellon, [devin.abellon@yahoo.com](mailto:devin.abellon@yahoo.com)