TC4.7 Handbook Subcommittee

Agenda

2:30pm – 3:30 pm, June 28, 2022

"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) Sign-in / Introductions

2) Chapter restructuring:

   a. General consensus at the January meeting was to reorganize the chapter this cycle (2025 HOF) to simplify a split into two chapters in the future (potentially for the 2029 HOF).

   b. Review of current organization, start realignment of sections (and subsections)

3) Assigned Topics / Tasks – Updates:

   a. Add some content on empirical validation (Standard 140).   Ron J. / Joel N.

   b. Add content on carbon emissions. Multiple sources of emissions. (Standard 209 has working group)   Erik K. / Daniel V.

   c. Update references to ground-coupled systems and expand that content to make it more relevant to today's usage and design of those systems.   Jeff H.

   d. Add content on optimization across multiple buildings   Wangda Z.

   e. Combined Heat & Power Systems – Review two chapters by TC1.10 and add content to Chapter 19 as applicable   Ralph M.

   f. Grid Stuff – Review chapter by TC1.9 and add content to Chapter 19 as applicable   Ralph M.

   g. Add content on Elevation Variations – Air property issues, address equipment performance, geography vs. tall buildings. Standard 140   Joel N.

   h. Add new section on modeling thermal resilience. This would include weatherization and simulation – equipment changes or building changes to improve resilience. How it affects modeling / how modeling affects building choices.   Tianzhen H. / Jason D.

   i. Add content on Dynamic High Frequency System Modeling – Modelica? Ties to grid stuff and controls modeling – 15 minute modeling or less. Additional issues that can arise when subhourly modeling.   Michael W.

   j. Add content on appropriate simplification – Temporal and Spatial. Create table for simplified through complex modeling (with multiple levels) and when to use. Provide references to this table in text and add examples (papers). Example of Model Simplification – any research?   Tianzhen H. / Erik K.

k. Add content on thermal zoning - Different zoning for winter vs. summer. Research and references? Thesis available?   Jeff H. and student

l. Add content on terminal unit systems (Chilled Beams, radiant floors, etc.) – active vs. passive. Active systems easy to model; passive systems much more difficult to model. Trane has a paper on passive. Contact healthcare designers such as AEI.   Sagar R.

m. Add content on renewables.   Jeff H. / Ron J.

n. Add content based on RP1741 Fan Coils   Neal K.

4) Topics previously discussed for consideration:

   a. NEW TOPIC: Level of Detail (LoD) in Building Energy Modeling – Jeetika Malik, Tianzhen H., Erik K.

   b. Decarbonization. Or does this fall under item 3b?

   c. Predictive Modeling (determining inputs).

   d. Add some content on code-compliant modeling – commercial vs. residential

   e. Building Energy Modeling for Net Zero (New Chapter section)

   f. Standards under TC4.7's umbrella:

      • Standard 140

      • Standard 205: will be published prior to the 2025 edition of Fundamentals.

      • Standard 209: is undergoing a revision / update. We will need to update references to Std 209 in Chapter 19.

      • Standard 229: ? Timeframe may extend beyond 2025 Fundamentals.

      • Standard 232P

   g. HVAC Toolkit updates (if any) – Only Toolkit II is listed / referenced. Need to add Toolkit I.   Jeff H.?

   h. Completed RP's – We need to contact the authors of the RP's. Names / contacts?

      • Chiller plant Control Strategies
      • RP 1742 Plug Loads
      • Others?

   i. Misc. Ideas

      • Based on the Introduction section of Joe Clarke's book -- "Energy Simulation in Building Design" (2001) 2nd Ed., Routledge – there are a few other topics that could be added in brief: Surface convection, interior and exterior IR exchange, internal gains, moisture. Proposed sections on 1. Boundary Conditions and 2. Moisture
      • Section recommended on recent work by PG&E and LBNL to develop methods to test and validate the predictions of black box models, for example:

        i.   Granderson, et. al., "Accuracy of Automated Measurement and Verification (M&V) Techniques for Energy Savings in Commercial Buildings," Applied Energy 173 (2016) p. 296-308.

        ii.   Price, et. al., "Commercial Building Baseline Modeling Software: Performance Metrics and Method Testing with Open Source Models and Implications for Proprietary Software Testing," Final Report, ET no. ET12PGE5312, Sept. 9, 2013, www.etcc-ca.com.

        iii.   Jump, et. al., "Functional Test Protocols for Commercial Building Efficiency Baseline Modeling Software," ET no. ET12PGE5312, Sept. 9, 2013, www.etcc-ca.com.

- Addressing the issue of temperature based control vs. load based control in simulation.
- Also address coupling of models? Applications and general methods? Internal vs. external.

    j.   Atrium Modeling

5) New Ideas?

6) Adjourn