

## **Building Operations Dynamics SubCommittee**

**Monday, January 26, 2009, 4:00-5:30 PM, Grant Park Room**

### **Scope of the Subcommittee:**

*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."*

### **Sub Committee Activities:**

**What will and will be the focii of this sub committee**

- 1. Focus should be on research – developing a research agenda, collecting research ideas, developing RTARs and WSs, managing projects.**
- 2. Program ideas should come from research projects, seminar and other ideas should go to Program sub.**
- 3. Handbook content should be direct result of research and built in it. Could take over the portions of handbook done by 7.4. What chapters / sections of chapters are / should we contribute to?**

### **Research Agenda:**

#### **Recently Completed Research Projects:**

- 1. 1340-RP “Intelligent Control of Combined Heat and Power Systems” (PI: Itzhak Maor PWI Energy); Rich Hackner, PMS Chair**
2. 1313-RP “Evaluation of Building Thermal Mass Savings” (PI: Gregor Henze, University of Nebraska); Jim Braun, PMS Chair.
3. 1252-RP “Interaction between Dynamic Electricity Rates and TES Controls” (PI: Todd Rossi, Field Diagnostics Inc.); Michael Kintner-Meyer, PMS Chair.
4. 1194-RP “Dynamic Cooling Coil Models” (PI: James, Purdue University); Mike Brandemuehl, PMS Chair.

#### **Active Research Projects:**

- 1. 1390-TRP “Short-Term Curtailment of HVAC Loads in Buildings”  
Successful Bidder – TBA (PMS Chair is John House)**

#### **Tentative Research Projects:**

**None at this time.**

#### **Co-Sponsored Research Projects:**

1. 1312-RP “Tools for Evaluating Fault Detection and Diagnostic Method for Air-Handling Units” (PI: Jin Wen Drexel University); Phil Haves, PMS Chair.

### **Work Statements:**

**None at this time.**

### **RTARs:**

1. Real-Time Optimal Control in a Distributed Environment. Jim Braun authored the RTAR; Jonathan Wright is the leading the WS effort. Jonathan has developed a workstatement. Jim and Les Norford reviewed the workstatement and felt there were some fundamental changes necessary. Specifically, they felt it was necessary to have a simulation of a specific system as part of the first phase of research. There is work occurring at CSIRO on agent-based control that might benefit our effort. (Gregor, Agami, and Srinivas will take another look at the workstatement developed by Jonathan – for SLC)
2. 1440-RTAR Occupancy Detection through Wireless Sensing. (Gregor is going to take another look for SLC).

### **Co-Sponsored RTARs and WS:**

1. VAV System Setpoint Reset using Zone Demand. Steve Taylor is the author from TC 1.4. There is interest in the topic because it addresses supervisory control issues; however, the RTAR has not advanced over the past year. TC 7.4 will monitor status of RTAR. (House will follow-up with TC 1.4). Any progress here?
2. **RTAR 1511 “Specifying a Building Systems Emulation Tool for Building Operations” with TC 7.5 –Revised RTAR has been provided to RAC with a cover letter addressing the comments of RAC from 11/07. (12/08)**

### **Research Ideas**

1. Net-ZEB and the impact on the grid ... the members felt that this topic was important and needs more time for discussion at the next meeting. Load shapes of Net-ZEB are an issue that must be considered too. Haves will work on RTAR for SLC.

### **Prioritized Research Topics (June 2007):**

1. **Short-Term Curtailment of HVAC Loads in Buildings: NOW A PROJECT!**  
**Les Norford**
2. Real Time Optimal Control in a Distributed Environment: Gregor Henze / Agami Reddy / Srinivas Katipamula

3. Dynamic Models of Internal Thermal Mass: Peng Xu (will work on RTAR for SLC)
4. Dynamic Models of Underfloor Air Distribution Systems

**New ideas for Research?**