

# **RESEARCH PLAN**

## **TECHNICAL COMMITTEE 9.9**

### **PROJECT TITLE**

The Building Automation System's Role in Commissioning of HVAC Systems

### **OBJECTIVE**

The overall objective of the proposed research would be development of procedures that could be implemented by current and emerging generations of Building Automation Systems (BASs) to allow them to serve as powerful commissioning tools for commercial buildings. The project would achieve this through:

- Definition of the tools (e.g., data loggers, forms and procedures, communications, etc.) required for a complete list of commissioning tasks,
- Identification of the potential role of BASs in meeting the requirements of these commissioning tasks,
- Review of the state of the art in BASs and their adequacy in meeting the requirements,
- Identification of monitoring data points required for commissioning that are typically available in a BAS,
- Broad specification of algorithms that could be developed into a commissioning application,
- Specification of the required BAS sensing, trending, storage, testing, analysis and reporting capabilities,
- Identification of minimum commissioning procedures that must be performed on the BAS before it can be used in commissioning other systems, and
- Establishment of validity, through historical documentation of the success or failure of a series of case studies.

### **BENEFITS**

The BAS can have a substantial role in the HVAC commissioning process, since the control system touches every other major subsystem of the building and since an BAS typically includes much of the same equipment that is required by a commissioning team. Potential roles for an enhanced BAS tailored to support commissioning include:

- Trending data initially (in the commissioning process) and throughout the life of the HVAC system;
- Initiating control sequences for functional and performance tests, such as overriding setpoints for part load performance tests;
- Implementing commissioning specific alarms that alert the commissioning team that performance is not meeting design intent;
- Verifying logic, implementation and performance of control strategies;

- Tracking, documenting and summarizing inspections and functional and performance tests;
- Measuring and verifying the savings (or other measures) achieved by commissioning; and
- Comparing building performance with expectations (output from building emulator or simulation programs, benchmarks, historical performance) for initial diagnostics and ongoing performance verification.

## **ESTIMATED COST**

\$75,000

## **ESTIMATED DURATION**

One year

## **METHOD OF PUBLISHING RESULTS**

The program would result in a final report which will also be summarized as an ASHRAE symposium paper or journal article. The results of the program may also support the development of future editions of ASHRAE guidelines, standards and/or handbooks.

## **POTENTIAL CO-SPONSORS**

TC 1.4 Control Theory and Application

## **Research Plan Authors**

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