Test and evaluation of a method to identify heating system malfunctions by using information from electronic heat cost allocators

Proper heating system operation in buildings is a vital area for the realization of low-temperature district heating with supply and return temperatures of 55 °C and 25 °C respectively. But the operating area of the district heating companies usually only extends to the substations at the entry of the buildings, and very little is known about the actual use and distribution of heat inside the buildings. This paper describes one possible method for district heating companies or building technicians to monitor heating system operations, and thereby identify heating system malfunctions, inside apartment buildings. The method uses data from existing electronic heat cost allocators to locate radiators with high return temperatures. The method was tested by comparing data from heat cost allocators with detailed measurements of radiator return temperatures in an apartment building in Frederiksberg, Denmark. The investigations indicate that data from the heat cost allocators can be used to identify radiators with continuously high return temperatures, and thereby locate severe problems with e.g. hydraulic balancing in heating systems. However, the method needs further development and tests to ensure the accurate identification of the various heating system malfunctions and their effect on overall heating system efficiency.

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