CENTER FOR ENERGY AND ENVIRONMENT

Technical Fact Sheet

Multifamily Facility Management Services

CONVERSION OF TWO-PIPE STEAM HEAT TO HOT WATER HEAT

Description:

Steam-to-hot-water conversion is the practice of replacing an older steam heating system with a modern hot water heating system. Savings for conversion range from 16% to 50% of annual heating costs, with 30% being typical. Conversion saves primarily because hot water systems heat more evenly and are easier to control. In addition, typical temperatures for hot water systems are much lower than for steam, resulting in improved boiler and distribution efficiencies. Actual paybacks for this retrofit range from six to fifteen years. However, building owners who have implemented this retrofit cite many benefits including large dollar savings, more even heating, reduced tenant complaints, lowered maintenance cost and effort, and improved building value.

While any steam building can be converted from steam to hot water heat, it is most practical for two-pipe steam (TPS) systems, in which minimal changes to existing distribution pipes and radiation are required. In a TPS building, most of the existing piping should be compatible and re-usable in the new system. Radiators found in most TPS buildings can also typically be reused with a few simple changes. Boiler replacement is not required as part of a steam-to-hot-water conversion. If the existing boiler is in good shape (for example, it shows no obvious signs of leaks and has been well maintained, or was recently installed) there is a good chance it can be converted as part of the retrofit, reducing costs considerably. If in doubt, a qualified contractor should perform a Hydrostatic Test on the existing boiler to see if it can maintain the higher pressures required in a hot water system.

How to Implement:

Steam-to-hot-water conversion should only be completed by a licensed, qualified contractor; ideally one experienced with conversions. The building owner should discuss general conversion options with several different contractors including such issues as whether or not to replace the existing boiler, whether radiators are hot water compatible, whether radiator valves have to be replaced or re-packed and whether any supply or return pipes need to be replaced. After initial discussions, a summary of the conversion plan should be written up and submitted to each contractor for bidding purposes. It is recommended that the building owner obtain two and preferably three bids before selecting the contractor who will actually complete the work.

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Older TPS buildings are good candidates for conversion. As a result, even if conversion does not fit into current plans, it should not be overlooked as an option for the future. For instance, if the steam boiler in a TPS building ever needs to be replaced, it is the perfect time to convert. The added costs of converting the building to hot water at the time of a boiler replacement are relatively small by comparison and reap major benefits.