

Discussions for the Technical Papers from the 2018 ASHRAE Annual Conference in Houston, Texas

This is a compilation of the written questions and comments submitted to authors by attendees at the 2018 ASHRAE Annual Conference in Houston, Texas. All authors were given the opportunity to respond.

The questions/comments and authors' responses are published with the papers in the hardbound volume of *ASHRAE Transactions*, Vol. 124, Part 2.

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An Evaluation of HVAC Failure and Maintenance Equipment Data for Facility Resiliency and Reliability

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It would help the readers of this paper if the various types and sizes of HVAC systems and equipment were clearly defined and described, including the five types of air-handling units and two types of condensers. Otherwise, we cannot relate the authors' analysis and conclusions in this paper to our experience.

How is failure defined for each type of equipment?

It would also help the reader if the magnitude and quantity of energy waste or savings resulting from maintenance were described so we can determine if more or less maintenance is justified.

C.C. Thompson: We separate the information into as many categories as the data permit. For some equipment, there is

sufficient data and detail to create subcategories of component type, size, etc. For others, we have only a main category heading. In this case, we have a main category of air-handling units and subcategories relating to humidification means, packaged multizone units, and whether the units have an ASD. It would be great to subdivide this into sizes or water/refrigerant type, but the data simply do not permit this level of detail. We have the same issue with condensers.

Failure is the inability of a component to perform its intended function. This is a judgment call made by our engineers based on information in the equipment maintenance records.

An economic/energy analysis of maintenance is outside the scope of the database.