

**INTERPRETATION IC 90.1-2013-5 OF
ANSI/ASHRAE/IES STANDARD 90.1-2013
Energy Standard for Buildings Except Low-Rise Residential Buildings**

Date Approved: April 18, 2015

Request from: Steve Tredinnick, Burns & McDonnell (TC 6.2 District Energy), 1431 Opus Place, Chicago, IL 60515.

Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IES Standard 90.1-2013, Section 6.5.4.6, relating to pipe sizing for district energy systems.

Background: District energy have three major systems components comprised of central plants, distribution systems and interconnections to consumer buildings – all three components use piping systems to transport the energy from the plant to the end user. The Pipe Sizing requirements listed Table 6.5.4.6 seems to be tailored to smaller sized piping specific for building usage below 14” which conforms to good engineering practices for these “smaller” pipes.

District energy systems are developed using master planning and an investment grade financial analysis that is based on good engineering design practices for the three system components for an identified customer market. Most contemporary district cooling plants are much larger than 30,000 tons and would exceed the 24” diameter size listed in the Table. Typically all major equipment is selected on a life cycle cost basis with longer payback requirements in order to have the most affordable efficient system possible for the life of the system.

For most district energy systems in mature urban environments the initial master planning of the system establishes pipe sizes based on a targeted customer base that may take years to reach if it ever does. Many of the newer developments in Asia and the Middle East are becoming larger and larger with central plants over 75,000 tons with some over 120,000 tons. Applying Table 6.5.4.6 to these systems results in piping that is oversized, extremely unwieldy and not practical to install in central plants, buried beneath city streets and as service entry into customer buildings.

The cornerstone philosophy of district energy systems is to be as efficient as possible to keep rates low and competitive with respect to in-building central plant alternatives. This is true not only operationally, but also factors into the life cycle design and selection of system components.

Standard 90.1 has multiple sections that apply directly to efficient operation and selection of the system equipment components must be (chillers, pumps, cooling towers, etc.), but was it the intent that this standard for pipe sizing be used for larger district energy hydronic systems?

Assuming the interpretation is correct; can some text be added to the section and table stating that large district energy plants are excluded from these requirements? The concern is that code

inspectors will interpret the standard to be across the board on piping design and not specific to buildings.

Interpretation: Since the purpose and scope of this standard establishes minimum efficiency requirements for buildings other than low-rise residential buildings, pipe sizing for district energy systems can use good engineering practices and not those defined in Table 6.5.4.6.

Question: Is this interpretation correct?

Answer: Yes.

Comments:

The scope of 90.1 includes:

1. new buildings and their systems,
2. new portions of buildings and their systems,
3. new systems and equipment in existing buildings...

District Energy System is defined in ASHRAE Standard 166 - *Heating, Ventilating, Air-Conditioning and Refrigerating Terminology* as:

centralized facility for generation and distribution of the heating and cooling and/or power needs of a community, rather than individual heat or cold generators (i.e., furnace or air conditioner) at each residential, commercial, or institutional site.