

**INTERPRETATION IC 90.1-2019-10 OF  
ANSI/ASHRAE/IES STANDARD 90.1-2019  
Energy Standard for Buildings Except Low-Rise Residential Buildings**

**Date Approved:** February 6, 2023

**Request from:** Maria Karpman, Karpman Consulting, 78 Eastern Blvd., Glastonbury, CT 06033.

**Reference:** This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IES Standard 90.1-2019 Appendix G requirements applicable to *computer rooms*.

**Background for Interpretation 1:**

Section 3 includes the following definition:

***computer room:*** a room whose primary function is to house *equipment* for the processing and storage of electronic data and that has a design electronic data *equipment* power density exceeding 20 W/ft<sup>2</sup> of conditioned floor area.

Table G3.1#7 states the following:

Where *HVAC zones* are defined on HVAC design drawings, each *HVAC zone* shall be modeled as a separate *thermal block*.

Section G3.1.1 (g) has the following requirement:

*g. Computer rooms* in *buildings* with a total *computer room* peak cooling load >3,000,000 Btu/h or a total *computer room* peak cooling load >600,000 Btu/h where the baseline *HVAC system* type is 7 or 8 shall use *System 11*. All other *computer rooms* shall use *System 3* or 4.

It is unclear how to apply the requirement in Section G3.1.1 (g) to an *HVAC zone*, shown on design documents, that includes both a *computer room* and other types of spaces.

This interpretation also affects requirements in Table G3.1 #10 baseline design column, exception 4 to Section G3.1.2.6, and Section G3.1.2.6.1 which all apply to "*systems that serve computer rooms*".

**Interpretation No.1:** The requirement in G3.1.1(g) to model a separate Baseline HVAC system type for *computer rooms* applies to any *HVAC zone* that includes a *computer room* irrespective of the gross floor area of the *computer room* relative to the gross floor area of other space types that may be included in the *HVAC zone*.

**Question No.1:** Is this interpretation correct?

**Answer No.1:** Yes

**Comments No.1:** The use of the defined term *HVAC Zone* presumes that the area in addition to the area of the computer room has similar loads that can be controlled by a single thermostat.

**Background for Interpretations 2 - 4:**

Table G3.1#4, Proposed Building Performance column has the following exception to HVAC Fans Schedules rule:

3. HVAC fans shall remain on during occupied and unoccupied hours in *systems* primarily serving *computer rooms*.

It is unclear which one of the following three criteria should the term “primarily” be applied to:

- a) the cooling load associated with *computer rooms* relative to the total cooling load of the HVAC *system*, or
- b) design air flow to *computer rooms* relative to the total design airflow of the HVAC *system*, or
- c) the *floor area* of the computer rooms relative to the total *floor area* served by the HVAC system.

**Interpretation No.2:** When *computer rooms* account for more than 50% of the *gross floor area* served by an HVAC system, such HVAC system is considered “primarily serving *computer rooms*” and is subject to the exception 3 to Table G3.1#4, Proposed Building Performance column HVAC Fans Schedules rule.

**Question No.2:** Is this interpretation correct?

**Answer No.2:** No

**Comments No.2:** While rules of thumb are often used to size HVAC systems from floor area, many assumptions are included in those rules of thumb. HVAC systems are sized for the load they serve. As such, the appropriate method of determining what the system “primarily” serves is based on the dominant heating or cooling load and the floor area is irrelevant.

**Interpretation No.3:** When *computer rooms* account for more than 50% of the cooling load of an HVAC system, such HVAC system is considered “primarily serving *computer rooms*” and is subject to the exception 3 to Table G3.1#4, Proposed Building Performance column HVAC Fans Schedules rule.

**Question No.3:** Is this interpretation correct?

**Answer No.3:** Yes

**Comments No.3:** As noted in Interpretation No.2, HVAC systems serve heating and cooling loads, not floor area. As such, the most significant load will dictate the operation of the HVAC system. The requirements of modeling computer rooms further supports this interpretation by establishing thresholds in terms of heat load generated (kW) or cooling capacity (btu/h) provided.

**Interpretation No.4:** When *computer rooms* account for more than 50% of the design airflow of an HVAC system, such HVAC system is considered “primarily serving *computer rooms*” and is subject to the exception 3 to Table G3.1#4, Proposed Building Performance column HVAC Fans Schedules rule.

**Question No.4:** Is this interpretation correct?

**Answer No.4:** No

**Comments No.4:** HVAC system airflow is not indicative of the load being served and should not be used as an indicator of the primary load. Low sensible heat ratio cooling loads generally require less air movement than high sensible heat ratio cooling loads. Further, manipulating the space temperature setpoints will change the required airflow to satisfy the cooling load (assuming fixed supply air temperature). In both situations it is possible for the “primary” load to occur in a room that does not have the “primary” airflow.