INTERPRETATION IC 90.1-2004-30 OF
ANSI/ASHRAE/IESNA STANDARD 90.1-2004
Energy Standard for Buildings Except Low-Rise Residential Buildings

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Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE/IESNA Standard 90.1-2004, Section G3.1.3.7, regarding type and number of chillers used in the baseline building.

Background: For the energy model of the baseline case, Table G3.1.3.7 states that "for building-conditioned floor area ≥ 22,296 m^2 (240,000 ft^2)", the number and type of chiller(s) should be "2 centrifugal chillers minimum with chillers added so that no chiller is larger than 2813 kW (800 tons), all sized equally". However, there is no clear guidance on the number of chillers used. It may greatly affect the result of energy cost saving since the COP requirements for the chiller (Table 6.8.1C) varies from 5 [for water cooled, electrically operated, centrifugal chiller with a capacity <528 kW (150 tons)] to 6.1 [for the same equipment type with a capacity ≥1055 kW (300 tons)].

Interpretation: For a baseline case with cooling load of 10,000 kW, four cases listed below can be used to meet the requirements of Section G3.1.3.7 for a water cooled, electrically operated, centrifugal chiller (defined in Table 6.8.1C):

1) 4 chillers (each with 2500 kW capacity and COP 6.1 under ARI 550/590 conditions)
2) 10 chillers (each with 1000 kW capacity and COP 5.55 under ARI 550/590 conditions)
3) 20 chillers (each with 500 kW capacity and COP 5.0 under ARI 550/590 conditions)
4) number of chillers same as the proposed building and capacities sized proportionally to the capacities in the proposed case

Question: Is this interpretation correct?

Answer: No.

Comments: In Standard 90.1-2004, Table G3.1.3.7 , for Building-Conditioned Floor Area greater than or equal to 240,000 ft^2 (22,296 m^2), requires the modeling of "2 centrifugal chillers minimum with chillers added so that no chiller is larger than 2813 kW (800 tons), all sized equally." The phrase "with chillers added" means that as the required tonnage of the chillers increases, additional chillers are added so that no chiller is greater than 2813 kW (800 tons). The proper interpretation is to minimize the number of chillers used in the modeling. Therefore number (1) in your example above (4 chillers of 800 tons (2500 kW) capacity each) is the only permissible option for the baseline building design.