

**INTERPRETATION IC 189.1-2011-1 OF
ANSI/ASHRAE/USGBC/IES STANDARD 189.1-2011
Standard for the Design of High-Performance Green Buildings
Except Low-Rise Residential Buildings**

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Request from: Charles R Foster, III (cfoster20187@yahoo.com), Foster and Jamison, 410 Rosedale Ct, Ste 170, Warrenton, VA 20186-4373.

Reference: This request for interpretation refers to the requirements presented in ANSI/ASHRAE/USGBC/IES Standard 189.1-2011, Sections 7.4.3.1.b.2, 7.4.5.1 and 7.5.4, relating to reducing building project electrical peak loads.

Background No.1: Electric peak load reduction in Standard 189.1-2011 is referenced in 3 locations; § 7.4.3.1.b.2, § 7.4.5.1, and § 7.5.4.

§ 7.4.5.1 requires “Building projects” to have the capability of reducing the peak electric demand of the building being considered by 10%.

§ 7.4.3.1.b.2 references the requirements of § 7.4.5.1 but reduces the peak shedding requirement from 10% to 5%.

§ 7.5.4 requires a building to comply with § 7.4 which would include both § 7.4.3.1.b.2 and § 7.4.5.1 (as applicable).

Buildings generally experience peak electric demands in either the summer or, alternatively, the winter. Summer building peak electric demands are generally driven by air conditioning and winter building peaks are generally driven by heating.

Separately, electric utilities experience system peaks that, like building peak demands, are generally seasonal. Thus, electric utilities are typically described as either “summer peaking” or “winter peaking.”

“Coincident peak” refers to that circumstance where a building’s peak electric demand coincides with the serving electric utility’s peak demand. Reducing a building’s peak electric demand when that demand is coincident with the utility’s peak is generally considered more valuable than reducing the building demand at other times when the utility has excess capacity. To that end, there is growing interest in use of dynamic (*i.e.*, time of use) pricing.

Std. 189.1-2011 is silent about the serving electric utility’s peak demand.

Interpretation No.1: Steffes Corporation interprets Standard 189.1-2011’s various references to reducing peak electric demand to be referring *only* to the building’s peak and not to the coincident utility’ peak.

Question No.1: Is this interpretation correct?

Answer No.1: Yes

Comments: Sections 7.4.5.1 and 7.4.3.1.b.2 require a system or systems that have the capability to reduce building electric peak demand. The Standard does not contain requirements related to when these systems are to be operated, for instance, in response to an on-site predicted peak or a coincident utility peak or both.

Background No.2: Steffes Corporation (and other companies) manufactures a number of electric heating products including

- 1) off-peak electric space heaters that incorporate thermal storage, and
- 2) grid-interactive electric space and water heating systems that incorporate thermal storage *and* are dispatched by serving electric utilities.

Both the off-peak electric space heater product and the grid-interactive electric space and water heating systems serve as thermal batteries, charging during periods when prices are low (reflecting excess capacity on the part of the serving electric utility) and discharging (heating) as the building needs heat.

The grid-interactive product goes further to incorporate smart grid technology by allowing the serving electric utility to dispatch the system in a manner that tends to reduce the utility's peak electric demands and, thereby, reduces customer costs.

Off-peak and grid-interactive systems are a good complement to the production of electricity from renewable energy resources like wind, solar and hydro, and many systems have been installed and are operational presently.

Buildings that employ electric thermal storage tend to be in heating dominated climates.

Buildings in heating dominated climates often experience their peak electric demand in the winter.

Likewise, although there are exceptions, utilities serving heating dominated climates tend to be winter peaking utilities.

Interpretation No.2: Steffes Corporation interprets Standard 189.1-2011 to allow the use of off-peak electric space heating products and grid-interactive electric space and water heating products to satisfy the capabilities required by §'s 7.4.3.1.b.2, 7.4.5.1, and 7.5.4.

Question No.2: Is this interpretation correct?

Answer No.2: Yes

Comments: Automatic thermal storage systems that are capable of reducing the building electric peak demand by the required percentage and that are contained entirely within the *building project* provide one method, but not the only method, to meet the requirements in Sections 7.4.3.1.b.2 and 7.4.5.1.

Section 7.5.4 does not contain any requirements for demand limiting or load shifting capability, only a requirement that the peak electric demand of the proposed design not exceed the peak electric demand of the baseline building design.