INTERPRETATION IC-90.1-1989-3 OF
ASHRAE/IES STANDARD 90.1-1989
ENERGY EFFICIENT DESIGN OF NEW BUILDINGS
EXCEPT LOW-RISE RESIDENTIAL BUILDINGS

February 20, 1990

Request from: Elena Schmid, Manager, Building and Appliance Efficiency Office, California Energy Commission, 1516 Ninth Street, Sacramento, CA 95814-5512

Reference: This request refers to ASHRAE/IES 90.1-1989, Table 11-1.

Background: The California Energy Commission requested interpretation of the electric storage water heater requirements in ASHRAE/IES Standard 90.1-1989.

In Table 11-1 "Standard Rating Conditions and Minimum Performance of Water Heating Equipment," the applicable test procedure listed for electric water heaters $\leq$ 120 gal. storage capacity is DOE Test Procedure 1988 CFR Title 10 Part 430 and for > 120 gal. storage capacity is ANSI C72.1-1972. The reference surface area for the standby loss (SL) requirement in the DOE Test Procedure is the tank surface and in the ANSI Test Procedure is the jacket (outer case) surface area.

The current and 1992 SL requirements for electric water heaters of > 120 gal. storage capacity are listed in Table 11-1 as <4 and <1.9 W/ft^2 respectively.

Question 1: For all sizes of electric storage water heaters, what is the reference surface area for complying with the standby loss requirements of 90.1-1989?

Answer 2: The tank surface area.

Comment: This interpretation for non-DOE-covered electric water heaters is consistent with the surface area referenced in subsection 7.3.1.1 of ANSI/ASHRAE/IES Standard 90A-1980 with respect to both the DOE water heater test procedure (re 7.3.1.1.1) and the ANSI C 72.1-72 test procedure (re 7.3.1.1.2). The project committee is considering issuing errata or other means of clarifying the intended reference surface area for Table 11-1 in 90.1-1989.

Question 2: Would standby losses of precisely 4 and 1.9 W/ft^2 respectively comply with the current and the 1992 SL requirements in Table 11-1 of 90.1-1989 for electric storage water heaters >120 gal. storage capacity?

Answer 2: No.

Comment: The mathematical symbol < means "less than." By definition the quantity 4 cannot be equal to a quantity less than 4. Likewise, the quantity 1.9 cannot be equal to a quantity less than 1.9.