



October 8, 2008

Ms. Jackalyne Pfannenstiel
Chairman and Associate Member, Efficiency Committee

Mr. Arthur Rosenfeld
Commissioner and Presiding Member, Efficiency Committee

California Energy Commission
Buildings and Appliances Office
1516 Ninth Street, MS-25
Sacramento, CA 95814-5512

DOCKET

08-AAER-1B

DATE OCT 08 2008

RECD. OCT 09 2008

**Subject: PG&E Comments on Title 20 45-Day Language for Portable
Electric Spas;**

**RE: 2008 Rulemaking on Appliance Efficiency Regulations;
Docket No. 08-AAER-1-B; Portable Electric Spas**

Dear Ms. Pfannenstiel and Mr. Rosenfeld:

These comments are divided into two parts:

Part 1: Background supporting PG&E's portable electric spa recommendations

Part 2: Specific recommended changes to Title 20 45-day language for portable
electric spas

We appreciate your consideration.

Sincerely,

Patrick Eilert
Program Manager, Codes and Standards
Pacific Gas & Electric Company

PART 1: BACKGROUND SUPPORTING PG&E'S PORTABLE ELECTRIC SPA RECOMMENDATIONS

Portable Electric Spas were first included in the 2005 Title 20 appliance standards (Title 20, Cal. Code Regs., §§ 1601 – 1608) that were adopted at the end of 2005. The 2005 Title 20 standards required testing and listing of portable electric spas and set minimum efficiency levels for portable electric spas effective January 1st, 2006.

Since the implementation of the standards, there have been ongoing discussions between PG&E and the spa industry (principally the Association of Pool and Spa Professionals, APSP) in regards to revising the spa test method based on results of industry testing. Discussions have been focused on the problems the manufacturers are having complying with the current spa test method and the need for a consistently repeatable test method. To address this, APSP developed a draft ANSI spa test method based on the CEC test method and, as part of this work, tested a variety of spas at a new test facility at Cal Poly San Luis Obispo.

Results from the Cal Poly spa testing and discussions between PG&E, APSP, and individual spa manufacturers revealed three main areas in the August 2008 Title 20 45-Day Language that need to be addressed related to portable electric spas: (1) the definition of spa volume, (2) the operation of ancillary equipment, and (3) temperature normalization of the measured standby power.

- (1) Spa Volume: The spa volume is not clearly defined in the current Title 20 standards. Because it is the primary input to the spa efficiency level (calculated as $5(V^{2/3})$), its value is critical to an unbiased and representative standard. Spa manufacturers generally list the spa volume as part of their specifications, but there is no industry standard as to how it should be measured. APSP and PG&E worked together to develop the definition shown in Part 2, which aims to represent the volume under normal operation and is not based on manufacturer specifications which may be exaggerated.
- (2) Ancillary Equipment: The spa industry and PG&E recognize that ancillary equipment, such as lights, audio systems and water treatment devices, and the associated power draw can vary greatly depending on manufacturer design and user behavior. The aim of the test method and regulation is to limit standby power. Ancillary equipment that can be switched off by the user will most likely be switched off when the spa is not in use and therefore should be allowed to be switched off during the test, as described in the recommended changes in Part 2.
- (3) Normalization of Standby Power: The testing at Cal Poly revealed that the ability to maintain strict control of ambient air temperature and water temperature have a significant influence on the measured standby power. Heat loss is a function of the temperature difference between the ambient air and the water. Normalization of the measured standby power based on the temperature

difference will provide more equitable test results. PG&E and APSP determined that the results should be normalized to a temperature difference of 37°F, which is derived from the test method in the Title 20 45-Day Language. A temperature difference of 37°F occurs at the limits of the temperature tolerances as defined in the test method ($100^{\circ}\text{F} - 63^{\circ}\text{F} = 37^{\circ}\text{F}$), which if achieved would give a manufacturer the most favorable results. Introducing normalization establishes an equal and consistent basis for reporting of spa testing results and enforcement of regulations. This clarification aims to make energy efficiency and Title 20 compliance a challenge for the design engineer, not the laboratory technician. The details of the normalization are shown in Part 2 below.

The recommended changes in Part 2 below also reflect the deletion of the requirement to report average relative humidity from the test method (1604(g)(2)). Average relative humidity is not required to be submitted according to Table X. Deleting this requirement from the test method will make the language consistent.

PART 2: SPECIFIC RECOMMENDED CHANGES TO TITLE 20 45-DAY LANGUAGE FOR PORTABLE ELECTRIC SPAS

The following revisions to the August 2008 Title 20 45-Day Language are recommended to clarify the spa volume and the test method.

1602(g)

“Spa volume” means the actual fill volume of the spa, under normal use, in gallons, as defined in the test method in Section 1604(g)(2)(B).

1604(g)

(2) Test Method for Portable Electric Spas

The test method for portable electric spas is as follows:

(A) Minimum continuous testing time shall be 72 hours.

(B) The spa shall be filled with water to the halfway point between the bottom of the skimmer basket opening and the top of the spa. If there is no skimmer basket, the spa shall be filled with water to six inches below the top of the spa.

~~(B) (C)~~ (C) The water temperature shall ~~remain at or above the test temperature of~~ be 102°F , $\pm 2^{\circ}\text{F}$ for the duration of the test.

~~(C) (D)~~ (D) The ambient air temperature shall ~~remain at or below the test temperature of~~ be 60°F , $\pm 3^{\circ}\text{F}$ for the duration of the test.

~~(D) (E)~~ (E) The standard cover that comes with the unit shall be used during the test.

~~(E) (F)~~ (F) The test shall start when the water temperature has been at 102°F , $\pm 2^{\circ}\text{F}$ for at least four hours.

~~(F) (G)~~ (G) Record the total energy use for the period of test, starting at the end of the first heating cycle after the ~~four-hour~~ stabilization period specified in Section 1604(g)(2)(E)(F), and finishing at the end of the first heating cycle after 72 hours has elapsed.

~~(G)~~ (H) The unit shall remain covered and in the default operation mode during the test. Energy-conserving circulation functions, if present, must not be enabled if not appropriate for continuous, long-term use. Ancillary equipment including, but not limited to lights, audio systems, and water treatment devices, shall remain connected to the mains but may be turned off during the test if their controls are user accessible. (I) The measured standby power shall be normalized to a temperature difference of 37°F

using the equation, $P_{norm} = P_{meas} \frac{\Delta T_{ideal}}{\Delta T_{meas}}$.

Where:

P_{meas} = measured standby power during test (E/t)

ΔT_{ideal} = 37°F

ΔT_{meas} = $T_{water\ avg} - T_{air\ avg}$

$T_{water\ avg}$ = Average water temperature during test

$T_{air\ avg}$ = Average air temperature during test

~~(H)~~ (J) Data reported shall include: spa identification (make, model, S/N, specifications); volume of the unit in gallons; ~~cover R-value~~; supply voltage; ~~average relative humidity during test~~; minimum, maximum, and average water temperatures during test; minimum, maximum, and average ambient air temperatures during test; date of test; length of test (t, in hours); total energy use during the test (~~P/E~~, in Wh); and normalized standby power (~~P/t~~, P_{norm}, in watts).

1605.3(g)

(6) **Portable Electric Spas.** The normalized standby power, as defined in Section 1604(g)(2)(I), of portable electric spas manufactured on or after January 1, 2006, shall be not greater than $5(V^{2/3})$ watts where V = the fill ~~total~~ volume, in gallons.

Table ~~VX~~ Continued - Data Submittal Requirements

Portable ElectricSpas

*Voltage

Volume (gallons)

Rated Capacity (number of people)

~~Insulation R-value of Spa Cover Provided with the Spa~~

Normalized Standby Power (watts)

Spa Enclosure is Fully Insulated Yes, no

~~If Spa is Fully Insulated, R-value of Insulation~~

REFERENCES

CEC 2008. California Energy Commission, *Proposed Amendments to Appliance Efficiency Regulations (Express Terms) California Code of Regulations, Title 20, Sections 1601 through 1608, 45-Day Language*, Docket Number 08-AAER-1B, Publication Number CEC-400-2008-021, August 29, 2008.