To: Rebecca Duff, ICF Consulting
1725 Eye Street NW, Suite 1000
Washington, DC 20006

From: The Power Sources Manufacturers Association Energy Committee

Date: March 20, 2009

Re: **Draft 4** ENERGY STAR® Version 1.0 Computer Server specification

This letter is to provide feedback to the EPA on the subject Specification, with respect to the testing of DC input Server Power Supplies. The specification does a very good job in promoting an overall increase in efficiency in a critical and growing energy usage segment of our overall infrastructure. The inclusion of DC input products is a laudable addition, as it recognizes the increasing use of DC distribution type system in the data processing universe. The issue that we would like to draw your attention too is the selection of a test voltage for the evaluation of servers that are operated from a DC power buss.

The use of a "48Vdc" distribution buss is a common practice and is an outgrowth of the 48Vdc systems used in the modern Telecommunications network. The issue is that there is in realty no true "48Vdc" voltage buss. The term "48Vdc" is often used as a short hand description of a DC system with battery back-up. In such systems, commonly a 24 cell battery string is used to provide the back-up buss for fail safe operation in the presence of AC grid failures. The term "48" comes from the fact that the open circuit voltage of lead-acid cells is near 2V and consequently a 24 cell string will show 48V. In the real world, however, the individual cell voltage is typically maintained at 2.25Vdc per cell. This then yields a string voltage of 54V. This voltage is the true voltage presented to the network 98% of time. The only time during the life of the system that the buss voltage is lower is during actual discharge, which in most Data Center applications is measured in minutes.

The input structure of most DC/DC power supplies is typically designed optimized for a specific input voltage. Movement way from that voltage in either

P.O. Box 418, Mendham, NJ, 07945-0418
Tel: 973-543-9660, Fax: 973-543-6207, E-Mail: power@psma.com, Web Site: www.psma.com

a positive or negative direction usually results in a lower operating efficiency. Thus, the announcement that the test point for these supplies is 48Vdc will encourage the design and development of power supplies optimized for operation at something other than the real operation point that the product will see in the field. This will potentially "cost" this application space a great deal in lost real world efficiency due to sub-optimization.

Below are listed several industry standards that correctly deal with the true DC bus levels that can be expected in what is commonly referred to as a 48Vdc system. We would strongly encourage a re-evaluation of this test point voltage determination.

- ANSI ATIS-0600315-2007 defines the typical voltage as 53.0, with the following footnote:
  The value is a compromise between equipment operating with VRLA and flooded technology battery.
- Verizon VZ-TPR-9205 (http://www.verizonnebs.com/TPRs/VZ-TPR-9205.pdf#page=9) defines the voltage as -53.0 +/- 0.25V to be used when measuring energy efficiency.
- The -53 +/- 0.25V value was used in early drafts of the ATIS energy efficiency standard, but that was later widened to -53.0 +/- 1V. This is now reflected in the ANSI family of standards for telecom energy efficiency (ATIS-0600015.2009, ATIS-0600015.01.2009, etc.); see https://www.atis.org/docstore/product.aspx?id=24547 and https://www.atis.org/docstore/product.aspx?id=24548.
- AT&T's energy efficiency requirements are to follow the ANSI/ATIS requirements; this is indicated in AT&T's TP-76200 document (https://ebiznet.sbc.com/sbcnebs/Documents/ATT-TP-76200.pdf#page=99), which indicates the -53V +/-1V test condition.

Thank you for your consideration in this matter.

Regards,

Dustin J Becker
Chairman, PSMA Energy Efficiency Committee

Contact Information:
E-mail: dusty.becker@emerson.com
Phone: 630-240-9906

P.O. Box 418, Mendham, NJ, 07945-0418
Tel: 973-543-9660, Fax: 973-543-6207, E-Mail: power@psma.com, Web Site: www.psma.com