ENERGY STAR® for UPSs Pre-Final Draft - APC by Schneider Electric Comments

Jim Spitaels – February 24, 2012

Introduction

Thank you for allowing APC by Schneider Electric to provide input into the ENERGY STAR for UPS specification development process. This document summarizes our responses to EPA's requests for comments on the proposed changes to the final draft as described in the announcement memo, the stakeholder webinar presentation and the latest Test Method. In general, our comments elaborate on and refine the points we made during the stakeholder meeting held on February 15, 2012. We look forward to continued productive dialog with EPA on the specification, the test method and the PPDS.

Comments

1. **We support the proposed changes to the loading profiles for VI and VFI UPSs rated ≤ 1.5kW**
   We believe that the new loading profiles more accurately reflect the largely commercial usage of these products.

2. **The proposed efficiency requirements are excessive for all UPSs rated ≤ 10kW and for VFI rated > 10 kW**
   - The proposed 1% increase in required efficiency for VI UPSs rated between 1.5 and 10kW and for VFI UPSs of all power levels is too large of a change to make this late in the specification process. It will cause many products not to qualify and erode the safety margins of those that do, often to unacceptable levels. It will particularly disadvantage low voltage units (e.g. 100V, 120V), especially above 1.5kW, as we've commented previously. We suggest that you re-examine your data to see if you agree this high voltage advantage is present. We further suggest that levels be set in 0.5% or perhaps even 0.1% increments as required by the data and the market share targets.

   - We therefore suggest this version of Table 2 for inclusion in the final draft:

Output Power	Input Dependency		
	VFD	VI	VFI
P ≤ 1.5 kW	0.965	0.965	$0.0099 \times \ln(P) + 0.81$
1.5 kW < P ≤ 10 kW	0.97	0.965	$0.0099 \times \ln(P) + 0.81$
P > 10 kW	0.97	0.95	$0.0099 \times \ln(P) + 0.805$

3. **We agree with the proposed change that only UPSs that qualify by use of multi mode averaging should have to ship in their highest input dependency mode**
   We believe that this provides the proper incentive to encourage manufacturers to provide multiple normal modes in their products without requiring that we mandate the use of such modes by our customers.

4. **We agree that manufacturers should be allowed to define the minimum and maximum system configurations for modular UPSs**
   This change will allow subsets of product lines to qualify and avoid testing of configurations that aren't sold.

5. **We agree with the proposed Power Factor requirements and definitions**
   Testing only at full resistive load for VI and VFI UPSs is in keeping with IEC 62040-3 Ed. 2 and avoiding such testing for VFD UPSs seems logical.

6. **Metering requirements need further clarification**
   - We continue to recommend requiring an energy measurement accuracy of ± 5% of the maximum system rating at loads above 10% (inclusive of all meter and transducer errors). Requiring compliance with standards designed for the testing of standalone meters would likely result in only UPSs that bundle such meters qualifying for the credit as it will be too burdensome to prove that a UPS's internal metering circuitry meets the numerous and stringent requirements of such standards.

   - If standards governing meter and transducer accuracy are to be referenced, we suggest that all such requirements be limited to compliance only with the relevant sections of the standards concerning energy measurement accuracy. We also recommend that the requirements for UPS metering and communications be harmonized with the ENERGY STAR for Data Centers requirements. The list of standards that we would like allowed are as follows:

     Meter Accuracy:
     - IEC 60687 Classes 0.2 S or 0.5 S
     - IEC 61036 Classes 1.0 or 2.0
     - IEC 62053-21 Classes 1.0 or 2.0
     - IEC 62053-22 Classes 0.2 S or 0.5 S
     - ANSI C12.1 (some solid state meters are qualified to this standard)
     - ANSI C12.16 Classes 0.5 or 1.0
     - ANSI C12.20 Classes 0.2 or 0.5

     Current Transformer Accuracy:
     - IEC 60044-1 Classes 0.1, 0.2, 0.2 S, 0.5, 0.5 S, 1, 3 or 5
     - IEC 61869-2 Classes 0.1, 0.2, 0.2 S, 0.5, 0.5 S, 1, 3 or 5
     - ANSI /IEEE C57.13 Classes 0.3, 0.6 or 1.2

     Note that some of these standards are no longer current. However an informal survey of the metering market indicates that some products that are currently for sale still claim compliance with these standards and not with their replacements, so in the interest of allowing the broadest selection of standalone meters to qualify, we recommend that they all be referenced in the ENERGY STAR for UPS specification. Similarly, because some meters only comply with either IEC or ANSI standards, we recommend allowing either.

   - Due to the variability of installation when the energy meter is not an integral part of the UPS, we continue to recommend that only the meter itself must be supplied to earn the credit (i.e. voltage and current transducers and other accessories are not required to be supplied with the UPS).

   - We still suggest that the specification be clarified to indicate that metering of the UPS's output energy, in all non-failure modes where the UPS is supplying power to the load (e.g. normal, bypass and stored energy modes), is required to qualify for the credit.

7. **We support the proposed changes to the test method and we suggest the following corrections and enhancements**
   - Table 1 should only allow 415Y/240 V Ac testing at 60 Hz to cover the nascent application of 415Y/240 V Ac in North America. Outside of North America, these products should be tested at 400Y/230 V Ac at 50Hz, as this voltage and frequency combination is far more prevalent.
   - The newly introduced 380Y/220 V Ac should be removed from Table 1 as nearly all products capable of running at this voltage will also be capable of running at 400Y/230 V Ac, and when this is the case they should be tested at that voltage due to its prevalence. If 380Y/220 V Ac is retained, it should only be at 50 Hz, as this is by far the most common frequency for this voltage.
   - Similarly, Table 1 should limit 230 V Ac to 50 Hz as it is very uncommon at 60 Hz
   - Table 1 should permit 200 V Ac 60 Hz for Japan
   - Table 1 should permit 120 V Ac 60 Hz because it is the nominal voltage for USA and to avoid possible issues with the requirements of Section 3.C (small North American UPSs output 120 V Ac so supplying 115 V Ac could cause some products to correct the voltage, thereby lowering their efficiency)
   - Section 3.C should only require that the output have the same nominal voltage and frequency as the input (i.e. it shouldn't mention waveform so as not to exclude non-sinusoidal output UPSs)
   - Section 3.D should only mention output voltage (direct current doesn't have a waveform per se)
   - Section 4.2.F.2 should allow the use of vendor supplied end user software to disable alarms in addition to physical controls on the UPS.
   - Section 4.2.F.3 should more accurately match IEC 62040-3 Ed. 2 Annex J.2.2.b "transfer of energy to and from the energy storage system shall be prevented during the test."
   - Please consider removing all references to Average Power in Section 5 and just calculate Average Efficiency as Output Energy divided by Input Energy over the same 5 or 15 minute period. Defining Average Efficiency should avoid conflict with other standard definitions of Efficiency based on instantaneous power ratios. If this change is not accepted, 5.B.2 needs to be expanded (or repeated) to measure both input power and output power.
   - Section 5.D and foot note 5 should both explicitly mention input power factor as the criterion of interest.
8. **We still believe that further work on the data reporting forms and PPDS is required and support EPA's plans in this regard**
   These documents should continue to evolve until a few products are piloted through the CB test and submittal processes and EPA's proposed electronic comparison tool is at least prototyped.
9. **We continue to support EPA's decision to focus the Version 1 specification primarily on efficiency and use phase energy**
   We believe that other issues such as material content, recycling and embedded carbon will be more comprehensively dealt with by the emerging IEC 62040-4 standard.

Conclusion

Thank you again for allowing APC by Schneider Electric to provide input into the ENERGY STAR UPS specification. We look forward to continuing to working closely with EPA on this important work.

Please contact Jim Spitaels via email at jspitael@apcc.com with any questions or concerns you may have regarding these comments or any of our earlier presentations or correspondence.