

ENERGY STAR® for UPSs Draft 2

APC by Schneider Electric Comments

Jim Spitaels – August 11, 2011

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 Eligibility Criteria Draft 2 Version 1.0 and the corresponding Test Method. In general our comments follow and elaborate on the points we made during the stakeholder meetings held on August 1 & 8, 2011. We look forward to continued productive dialog with EPA on the specification.

Comments

1. Not all UPSs rated $\leq 1500W$ are consumer products

We feel that the class definitions need to be reworded as follows to recognize the existence of business class UPSs rated $\leq 1500W$ and to better reflect data center class boundaries.

- Consumer UPS – A UPS that is Pluggable Type A Equipment (as defined by IEC 60950-1), with an input rating of less than or equal to 16A, with a VFD or VI Input Dependency Characteristic and complying with Class B emissions limits (per 47 CFR 15 or EN 55022).
- Commercial UPS - A UPS that does not meet the consumer definition and has an input rating of less than or equal to 63A.
- Data Center UPS - A UPS with an input rating of greater 63A.
 - Note that we believe that the 63A boundary more accurately reflects the starting power level of a data center and is consistent with European connector ratings and boundaries established in other IEC standards. If an output kW rating is preferable to EPA, we suggest 1.5kW and 50kW boundaries.

2. Average loading formulas depend only on the application or class, not on UPS output power rating

Therefore we recommend that the output power column should be removed from Table 1.

3. Maximum achievable efficiencies depend only on the UPS's input dependency and output power rating

Therefore we recommend that the UPS class column be removed from Table 2.

4. The efficiency requirements are still too high for certain types and sizes of UPSs

- No VFI UPSs rated $\leq 1.5kW$ meet the 97% efficiency requirement in Draft 2. Consequently we suggest the use of a formula for VFI UPSs of all sizes.
- VFI rated $\leq 1.5kW$ would still have trouble meeting the requirements of the existing formula (used at higher power levels). Consequently we suggest lowering the fixed portion of the formula by 0.005 to 0.80.
- VFD and VI UPSs rated $\leq 1.5kW$ need more margin (at least 0.5%) to cover unit to unit variations and test site to site variations. Consequently we suggest lowering the requirement for these UPSs to 96.5%.
- Our recommendations are summarized in this table:

Input Dependency	Output Power		
	≤ 1.5 kW	1.5 to ≤ 10 kW	> 10 kW
VFD	96.5%	97%	
VI	96.5%	96%	95%
VFI	$0.0099 \times \ln(P) + 0.80$		

5. We need definitive guidance for testing UPSs with multiple normal modes, each having the same input dependency

We suggest that such UPSs be tested in the highest efficiency variant of each normal mode that they are required to test.

- For example, a UPS with 2 or more VI modes must be tested in the highest efficiency VI mode
 - Only 1 test would be required
 - No averaging would be performed
 - The tested sub mode would be noted on the PPDS
- As a second example, a UPS with 2 VFD and 2 VFI modes must be tested in the highest efficiency VFD mode and the highest efficiency VFI mode
 - Only 2 tests
 - Equation 2 averaging applies
 - Tested sub modes would be noted on the PPDS

6. Not all UPSs comply, even by exemption, with RoHS

We therefore suggest that RoHS compliance should not be a requirement and should instead be declared on the PPDS.

- Small UPSs are not subject to RoHS in Europe until 2014
- Very large UPSs are considered to be part of the building and are therefore exempt
- Those UPSs that do comply do so largely via numerous exemptions
- EPA doesn't know how many UPSs will be categorically excluded if RoHS is required
- Sometimes the same UPS model is built in RoHS and non-RoHS variants which makes tracking difficult
- In no case should the CB be empowered to audit compliance
- EPA should wait for release and adoption of IEC 62040-4 before implementing potentially divergent or even conflicting environmental requirements

7. Deviating from the IEC 62040-3 Ed. 2 test method will increase regulatory complexity and the test burden on manufacturers

We therefore suggest that testing must exactly follow IEC 62040-3 Ed. 2. Specifically:

- Thermal stability time must initially be determined by the manufacturer via thermocouple temperature rise testing
- Subsequent testing can use thermocouples or 125% of manufacturer declared thermal stability time
- The manufacturer informs the CB whether the battery is to be disconnected during testing and of all necessary configurations and methods to prevent energy transfer to/from the energy storage system during testing
- After stability is reached 3 measurements are made, no more than 15 minutes apart (not continuous samples every second for 15 minutes)
- The CB is always free to question configuration changes made by the manufacturer and reject suspiciously selected or unstable data
- The IEC procedure was never meant to be performed without the participation of the manufacturer

8. We need additional guidance for testing internally redundant UPSs

We suggest that all redundant components can be removed or disabled during testing of internally redundant UPSs. Specifically:

- In addition to redundant power converters/modules, redundant controllers, redundant cooling devices, redundant static switches and other redundant components can be removed or disabled during testing, provided that the tested configuration remains a fully functional UPS, able to charge the energy storage system and operate in all of the same modes as it does with these redundant components installed and active.

9. Very few UPSs provide output energy metering

We therefore suggest that such metering not be required by EPA in Version 1, even for data center class UPSs.

- Installing meters in output distribution panel boards allows the use of fewer meters, simplifies meter reading and improves accuracy
- Stand alone meters are more easily and safely read, are simpler to install and typically provide revenue grade metering capabilities and additional functionality that customers expect
- Please see our presentation dated August 8, 2011 for details

10. Refurbished UPSs should be treated like all other ENERGY STAR IT products

We therefore suggest removing all refurbishing related requirements from the specification, to align with other IT related ENERGY STAR specifications.

11. We support the Draft 2 proposal regarding qualification of UPSs with multiple normal modes

We caution against changing the coefficients in Equation 2 until more field data is available on the actual usage of high efficiency modes.

12. We believe that a Draft 3 Specification and Test Procedure are required

Significant changes to the specification and the test procedure are ongoing and the final draft should only be published when the changes are only editorial in nature.

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.