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NEMA Comments on Energy Star Specification Draft #1 and Test Method Draft #2 for UPS Units
June 3, 2011

Thank you for the opportunity to provide the following comments on behalf of the UPS Committee of the NEMA Power Electronics Section. The Committee and Section include many of the U.S. manufacturers of UPS units. Thanks also for the May 12 stakeholder meeting, which provided for a constructive discussion of your progress so far and some if the proposals you have put forward for comment.

Data Collection

In general, NEMA endorses the suggestion made at the May 12 meeting that EPA and ICF contact any manufacturers for which there are questions regarding data submitted in response to EPA's request. The Agency's analysis should not rest on assumptions, but on solid facts. We appreciate that shortly after the May 12 meeting EPA issued the database for review and comment by manufacturers.
As noted during the meeting, there is support for EPA to use Power in the x axis of its data plots rather than output power (VA) since manufacturers test their units to watts, not VA.

Test Method Issues

Thermal Stability and Thermocouple Placement: As noted by Energy Star at the May 12 meeting, IEC 62040-3, Section J.2.2 (c) specifies that

> *the UPS and the load shall have been operated for a sufficient length of time to reach steady state conditions. The length of time determined during temperature rise type tests plus 25% is considered sufficient. Alternatively, trend variation of less than 2◦C temperature variation over not less than three consecutive readings with no less than 10 min interval may be considered steady-state for the purpose of this annex;*

NEMA agrees that Energy Star should adopt the following approach: If the vendor and EPA-approved Certification Body publish a time on the Energy Star Power and Performance Data Sheet (PPDS) at which the unit reaches thermal stability, then any testing organization should use 125% of that time and should not thermocouple the unit.

Moreover, as discussed on May 12, NEMA members recommend that Energy Star not specify precise thermocouple placement for thermal stability determinations. Instead, Energy Star approved labs and certification bodies should receive information from each manufacturer for whom they are testing and/or certifying product about where on the unit the thermocouples should be placed. This information should be conveyed from the manufacturer to the lab/CB as part of the request for testing/certification services.

Instrument Precision: As noted on May 12, the Test Method should include specific text on this issue rather than just a reference to the IEC standard.

Draft Specification

The following comments are organized based on the structure of the draft specification.

Definitions

We appreciate the efforts Energy Star has made to specify definitions used in the IEC 62040-3 Final Draft Standard. We recommend that Energy Star definitions, test methods and reporting formats remain identical to those specified in IEC 62040-3, Edition 2. This includes the definition of parallel UPS, which should be carried over to achieve clarity and differentiation from modular UPS

Regarding Redundancy, we heard from EPA on May 12 that it wants to make sure that UPS units qualified under Energy Star are tested and labeled as they are offered and sent to the customer ("as they are shipped"). As was discussed then, manufacturers work closely with their customers to provide what is requested, but once the unit has been purchased in many cases the manufacturer has no information on whether the UPS is deployed as a part of a redundant system.

Scope

Refurbished UPS: In general, NEMA supports EPA's proposal to include refurbished UPSs in the specification. However, we believe the practical implications of such a proposal must be examined very closely by EPA based on responses from individual manufacturers regarding their refurbishment programs. In addition, a remanufactured unit must be refurbished to the same specifications as when it was new and the date of original manufacture should still be present on the product.

Qualification Criteria

Energy Efficiency Requirements for AC-Output UPSs: The loading profiles embedded in the equations must be reflective of actual use cases for the wide variety of UPSs on the market. Specifically, three different weighted averages are needed for the three different UPS deployment scenarios (consumer, server and data center). See Table A.

Table A

	Weighting - EPA Proposal in Draft 1	**NEMA Proposal**
Consumer	25/50/25/0%	20/20/30/30%
Server	25/50/25/0%	0/30/40/30%
Data Center	25/50/25/0%	20/30/30/20%

Energy Star has tentatively drawn a line across the data that would result in 20 percent or less of the units being eligible for initial qualification. As discussed, manufacturers are concerned that this allowance would be too small and would unfairly penalize models whose performance is very near to but under the line – models that would still produce energy savings as compared to many units in the field today.

To achieve a better result, Energy Star should lower the proposed requirements in Table 1 of the draft specification and adopt the requirements and allowances shown in Table B below:

Table B

	Consumer (≤1.5kVA)	**Commercial** (1.5kVA-10kVA)	**Data Center** (≥10kVA)
VFD Eff_{AVG}	97%		
VI Eff_{AVG}	96%		95%
VFI Eff_{AVG}	0.0099 x ln (S) + 0.80		
Isolation Transformer Duty Allowance	3.65%		2.89%
Isolation Transformer Standby Allowance	1.95%		1.59%
Harmonic Filter Duty Allowance	3.32%		3.50%
Harmonic Filter Standby Allowance	1.98%		2.25%

Notes on Table B:

1) These proposed allowances are derived from Tables I.7 and I.8 of IEC 62040-3, Ed.2.

2) Some units include two isolation transformers in the active power path. These units should be granted/credited for two duty transformer allowances.

We would welcome further dialogue with Energy Star on this specific proposal.

Multi-Mode UPSs: The UPS industry is currently discussing this issue and has not yet reached consensus. We look forward to further dialogue within the industry and with Energy Star.

Power Factor Requirements: There should be no power factor requirements in Version 1.0 of the specification.

Standard Information Reporting Requirements:

- Power and Performance Data Sheet (PPDS): The PPDS should be an efficiency related subset of IEC 62040-3, Table D-1

  NEMA supports declaration on the PPDS of a unit's availability of multiple normal modes, but its must be obvious to the reader what normal mode was used for qualification. Every declared normal mode must have measured efficiency data on the PPDS.

- LCA: Requirements related to life-cycle analysis that are not directly related to energy efficiency should not be included in Version 1.0 A later version might include LCA once IEC 62040-4 is completed and in common usage in the industry.

Battery Recycling and Best Practices in Data Center Operation: Recycling requirements should not be included in the Energy Star specification, but NEMA supports EPA providing information on its website about battery recycling and/or UPS take-back programs.

Data Measurement and Output Requirements:

- Communications: As discussed at the stakeholder meeting, there is little to no support among NEMA UPS companies at this time to agree to a requirement that Energy Star UPSs would include an on-board energy meter with specific communications capabilities. High quality metering is available but in most cases it would be better deployed outside the UPS unit. We appreciated the opportunity to discuss the broader issue at length with Michael Zatz of the Energy Star Buildings Program.

Testing

Test Method: There should be no overlap between DOE Battery Charger regulations and Energy Star. The test procedures are different and the DOE regulation only applies to products made available for sale in the U.S.

Number of Units Required for Testing: See above comments.

Effective Date

Given Energy Star's intent to deliberately undertake two more draft-and-comment cycles for this specification and undertake further work on the test method, we believe that the September 1, 2011 effective date may too aggressive to allow for adequate consensus-building around the technical issues discussed above and to allow full preparation of the third-party certification process. We look forward to EPA's effective date proposal in the second draft.

Conclusion

Thank you for your consideration of these comments. We look forward to working with you further on this important project. If you have any questions on these comments, please contact Craig Updyke of NEMA at 703 841 3294 or cra_updyke@nema.org.