



KYLE PITSOR

Vice President, Government Relations

December 9, 2011

VIA EMAIL TO: UPS@energystar.gov

Mr. Robert Meyers
Environmental Protection Agency
Energy Star Product Development
1310 L Street, NW
Washington, DC 20005

NEMA Comments on Energy Star Program Requirements Specification for UPS Eligibility Criteria Draft #3 Version 1

Dear Mr. Meyers,

Thank you for the opportunity to provide the following comments on draft 3 of the Energy Star Specification requirement for Uninterruptible Power Supplies (UPS) Version 1.0. These comments are submitted on behalf of the UPS Committee of the NEMA Power Electronics Section.

As you may know, NEMA is the association of electrical equipment manufacturers, founded in 1926 and headquartered in Arlington, Virginia. Its member companies manufacture a diverse set of products including power transmission and distribution equipment, lighting systems, factory automation and control systems, and medical diagnostic imaging systems. Worldwide annual sales of NEMA-scope products exceed \$120 billion.

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 Alex Boesenberg of NEMA at 703 841 3268 or alex.boesenberg@nema.org.

Sincerely,

A handwritten signature in black ink that reads "Kyle Pitsor". The signature is written in a cursive, flowing style.

Kyle Pitsor
Vice President, Government Relations

**National Electrical
Manufacturers Association**

1300 North 17th Street, Suite 1752
Rosslyn, VA 22209
(703) 841-3274
FAX (703) 841-3374
kyl_pitsor@nema.org

NEMA Comments on Energy Star Program Requirements Specification for UPS Eligibility Criteria Draft 3 V1 and Test Method Draft 3 V1

UPS Eligibility Criteria Draft 3 V1

Loading Assumptions

NEMA appreciates EPA’s desire to keep the specification simple and avoid categorizing UPSs into Consumer, Commercial and Data Center segments. However, at power levels below 1.5kW, there are UPSs on the market designed for consumer and commercial applications and these UPSs have differing characteristics, tailored for each application. In general, consumer VFD UPSs are optimized for lower loads, whereas commercial VI and VFI UPSs are optimized for higher loads. Accordingly, NEMA suggests the following changes to Table 1:

Output Power	Input Dependency	Proportion of Time Spent at Specified Proportion of Reference Test Load, t_n %			
		25%	50%	75%	100%
$P \leq 1.5$ kW	VFD	0.2	0.2	0.3	0.3
	VI or VFI	0	0.3	0.4	0.3
1.5 kW < $P \leq 10$ kW	VFD, VI or VFI	0	0.3	0.4	0.3
$P > 10$ kW	VFD, VI or VFI	0.25	0.5	0.25	0

Table 2

NEMA continues to believe that the proposed efficiency requirements are too high for VFD and VI UPS ≤ 1.5 kW. While the percentage of passing UPSs looks acceptable (~25%), the margin of passing is so small that vendors are unlikely to qualify products and risk failing verification tests later. Testing accuracy is only 0.5% which is similar to the margin of the average passing UPS. VFD and VI UPSs need (at least 0.5%) more margin. It is important that Energy Star recognize the need for sufficient margin to allow space for manufacturing variation and testing accuracy.

We propose that the criterion in Table 2 for Input Dependency for VFD/VI devices of Output Power $P \leq 1.5$ kW be 0.965, as shown below.

Output Power	Input Dependency		
	VFD	VI	VFI
$P \leq 1.5$ kW	0.965		$0.0099 \times \ln(P) + 0.805$
1.5 kW < $P \leq 10$ kW	0.97	0.96	
$P > 10$ kW	0.97	0.95	

Metering

Metering Credit

We support the 2% credit for UPS > 10 kW. We believe that there is value in output energy metering for UPSs of all sizes (you can’t minimize what you don’t measure). Therefore we suggest a 1% credit for UPSs ≤ 10 kW as shown in this updated version of Table 3:

Output Power	Input Dependency		
	VFD	VI	VFI
$P \leq 1.5 \text{ kW}$	0.955		$0.0099 \times \ln(P) + 0.795$
$1.5 \text{ kW} < P \leq 10 \text{ kW}$	0.96	0.95	
$P > 10 \text{ kW}$	0.95	0.93	$0.0099 \times \ln(P) + 0.785$

Metering Requirements

Metering requirements are unclear in the specification.

- Accuracy and resolution requirements are not stated. NEMA recommends power accuracy $\pm 5\%$ of system rating for loads above 10%.
- It is unclear if meter must include current and/or voltage transducers, power supply and/or enclosure. Due to variability of installation, we recommend that only the meter is required.
- Lastly, metering specifications should be documented on the PPDS.

Multiple-normal-mode UPSs

NEMA makes the following suggestions:

- Efficiency at each load step, for every tested normal mode, should appear on the PPDS.
- UPSs that can qualify in their lowest input dependency normal mode should not have to ship in their highest input dependency normal mode. For example, a multiple-normal-mode UPS with VFI performance sufficient to qualify by equation 1, should have to test and report both VFI and VFD performance, but should not have to ship in VFD mode.

If the above change is not accepted, some vendors may remove high efficiency normal modes rather than put customers’ business critical systems at risk as a default of product shipment. This will result in a counter effect to which the Energy Star program was developed; to drive higher efficiency products in the market place. We believe an informed user/customer choice to be made regarding the trade-off between efficiency and input dependency.

Modular UPSs

- Manufacturer should be allowed to define min and max system configurations and they should be listed on the PPDS.
 - Manufacturers shouldn’t have to test configurations they don’t sell. Because a system capable of 20 power modules isn’t cost effective with 1 or 2
- It is unreasonable to disqualify an entire product family because some members don’t qualify. This could force manufacturers to block or eliminate slots in order to qualify

Power Factor

- Definition should be added
 - NEMA suggests; Power Factor = $P / S = \text{Watts} / (\text{Volts} \times \text{Amps})$
- The abbreviation PF may also be desirable
 - Section J should be renamed Abbreviations as none of the terms listed are acronyms
- Requirements should be clarified
 - Input power factor with 100% resistive load shall be greater than or equal to 0.90 in every tested normal mode.

Test Method Draft 3 V1

Test Procedure

- The procedure is not identical to IEC 62040-3 but it should be possible to gather IEC and ENERGY STAR data simultaneously
 - Small possibility of different results remains
- To ensure repeatability by third parties, the battery part number(s) and quantities, along with their connection status during testing should be documented on the PPDS
- Average power measurement needs to be defined in step 5A:
 - $P_{avg} = \text{Energy} / \text{Time}$
 - Energy integration rate should be specified
- Efficiency needs to be defined in step 5B:
 - $\text{Efficiency} = \text{Output Average Power} / \text{Input Average Power}$

Power and Performance Data Sheet

In light of EPA's desire to build a web based comparison tool, NEMA suggests that EPA continue to work with stakeholders and CBs to further refine the PPDS, beyond Draft 3 as necessary, to ensure that the document is both simple to complete for partners and useful to EPA and customers.