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March 18, 2011

Harinder Singh
California Energy Commission
Buildings and Appliances Office, MS-25
1516 Ninth Street
Sacramento, CA 95814-5512

RE: Docket 09-AAER-2, Proposed Efficiency Regulations for Battery Charger Systems

Dear Mr. Singh:

Thank you for the opportunity to remotely attend the recent Staff Workshop held March 3, 2011 to present the Draft Staff Report on Proposed Efficiency Standards for Battery Chargers and Lighting Controls (Proposed Standards) and subsequently discuss with your colleague Mr. Rider via phone some of the sector-specific issues the Workshop presentations highlighted for us.

The intent of this letter is to provide more detailed comments on some of the information used in the formulation of the Proposed Standards and to request that it be considered in the standards finalization process, particularly with respect to requirements for small battery chargers for low volume, non-consumer equipment.

Tektronix is a medium-sized company that produces professional test and measurement equipment that, in general, is not battery powered. A small number of products optionally capable of running off battery power are included in our portfolio to provide solutions in niche markets that require portability for some testing applications, e.g. on-site power analysis, remote base station testing, interference detection, etc. In many of these applications there are special safety concerns that must be considered in the design phase of the battery charging system to enable customers to collect data via floating or differential measurements safely in a variety of challenging environments. New product designs can take as long as 3 – 5 years to complete, including required certification testing, and battery-powered product platforms can stay in production for over a decade.

Our primary concern with the Proposed Standards is that the underlying data used in their formulation is not representative of the breadth of products the scope intends to cover. Aggregation of implementation costs across all small battery charger types is heavily weighted towards high-volume consumer goods. It does not accurately depict costs for low-volume specialty products and leads to the inappropriate conclusion that Proposed Standards universally meet the legislative criteria that the regulation must not result in any added total costs to the consumer over the designed life of the product.

We are equally concerned that the Proposed Standard is too ambitious – while it purports to be readily achievable using available external power supply (EPS) units, the standby power requirement goes beyond that of International Energy Efficiency Level V and European Energy-related Products Phase 2 levels. Neither of these standards is mandatory at this time but the latter standard will enter force in about a month. However, EPS units newly upgraded at great expense to meet this new standard will already be deemed 'obsolete' by the Proposed Standards. They will have to be redesigned immediately upon release if used to charge a battery. For EPS units rated under 50 W, the 0.3 W standby level of Proposed Standards inherently assume there will be no additional losses in the charging system after the EPS. For units larger than 50 W (51 W in Europe) the situation is worse, as Level V / Phase 2 compliant units meeting the required standby power performance of 0.5 W will be abruptly required to reduce this value *below 0.3 W* to enable any margin for the system as a whole.

Past experience with the expense and difficulty in meeting escalating efficiency standards applicable to external power supplies has revealed some issues that are unique to small volume producers of non-consumer products that are neither exclusively battery powered nor intended for exclusively back-up power scenarios, especially test and measurement equipment. Among these are:

1) *External power supplies must be customized.*
   Due to the specialty markets served, the relatively low volumes of sales in these markets and the subsequent need to provide a single worldwide product to achieve the best available economies of scale, off-the-shelf external power supplies cannot be used for professional test and measurement equipment. Specialized industry-specific connectors, safety-mandated isolation circuitry, import licensing requirements and special labeling requirements are among the factors that enforce usage of customized, product specific external power supplies.

2) *Supply base choice is limited.*
   Combining both the need for customization and the very low volumes required drastically reduces the suppliers who are both willing to meet these conditions and meet other supplier quality requirements. This lack of competition leads to further burdens on the buyer. Unlike manufacturers who can purchase external supplies as a commodity item, any upgrade in the custom market leads to extensive involvement of internal design and test engineers as well as project management resources.

3) *Lengthy design cycles disproportionately impact compliance costs.* Unlike consumer electronics, the same professional test and measurement product design can be sold for over a decade without platform redesign. Some test and measurement customers additionally require availability of products for system level replacement for multiple years as a condition of purchase. Because of the extended nature of the product design's life cycle, there is limited opportunity to absorb efficiency standards' upgrade-related costs into the initial design of the product. This leads to a disproportionate compliance cost impact and resource drain on manufacturers of products with extended redesign cycles as they must expend additional resources to upgrade an existing design rather than specifying compliance in a new design.

4) *Lithium ion battery safety requires special consideration.* Professional and industrial test and measurement equipment is subject to highly demanding environmental conditions globally and must be designed to meet disparate industry needs and sometimes dangerous test conditions. The migration to lithium ion technology has increased energy density and therefore battery life, but has brought heightened safety concerns with it. For companies that don't primarily sell battery-operated equipment, this has led to a need to work with battery systems experts when evaluating new or changed designs, adding significant cost to product modifications involving the battery and related charging system. Changes to lithium-ion battery pack designs also compel costly retesting to meet transportation requirements pertaining to hazardous materials.

Costs for making the upgrades to external power supplies (EPS) are significant in the low-volume custom sector and would be magnified greatly by the impacts of the Proposed Standard. The Proposed Standard would require a *fourth* upgrade of the EPS units used on current products that use batteries, even though these will already be compliant to International Energy Efficiency Level V. In addition, there would likely be necessary changes to the charging circuitry in the charging station, the end product, and in some cases in the battery pack itself. In all cases these changes will require significant additional costs for expert system level design review, internal verification and due diligence testing of efficiency, electromagnetic compliance, safety, reliability and environmental performance as well as 3rd party and agency approvals.

Despite the costing information received by the consultants contributing to the CASE report for mass-produced products, the fixed costs associated with such upgrades to low-volume professional test and measurement equipment will far outweigh any savings to be accrued over the life of the product. Though the CASE report does look at some non-consumer products, the selection is limited. After reviewing the example products, it has been concluded that the closest comparison for product life and duty cycle to portable test equipment is the handheld barcode scanner case. A comparison of some example fixed costs for some actual projects will illustrate the high level of fixed costs associated with

maintaining compliance to evolving efficiency standards which have, on average, not stayed constant for global products for more than two years since 2007.

Case 1: EPS Upgrade Project
Upgrade eight external power supply units from Level IV to Swiss Energy Ordinance Phase 2 efficiency performance and acquire necessary agency approvals. Project duration is ten months, and fixed cost per unit is $10.4 assuming products will be able to stay on the market without upgrade for two years and cost is spread evenly to all sales regions. If costs are distributed to California business customers exclusively, the cost per unit would increase dramatically.

Case 2: Battery Control Redesign Project
Implement additional safety features into battery charging system. Project duration of over six months with fixed cost per unit of approximately $90.8 assuming products stay on the market without modification for two years and cost is spread evenly to all sales regions.

A combination of these case-related costs is representative of what would be required on average to upgrade each low-volume test and measurement battery charger system based on the unique product market, supply chain realities and specialized safety considerations. For these non-consumer products, these costs would not be incurred without the impetus of the Proposed Standards.

Comparing the combined ‘best-case’ per unit fixed costs ($101.2 per unit) to the per-unit lifecycle benefit of the closest comparable product in the study (handheld barcode scanners) yields a Lifecycle Benefit / Cost Ratio of 0.2, demonstrating that the savings do not offset the associated costs. If incremental costs were additionally considered, the ratio would be even smaller.

It should also be noted that, depending on where a low-volume product design is in its life cycle, the sales volumes can be low enough that fixed redesign costs would increase to several hundred dollars per unit. In all likelihood these products would be forced to withdraw from the California market early as the redesign costs could not be justified. This premature withdrawal could impact the ability of California businesses to acquire compliant products in niche markets such as professional test and measurement and may have an effect on their competitiveness.

It is not clear how to determine the date of manufacture of a system when both the battery unit and the charger unit are sold separately from the base product, and each other, as purely optional accessories. In such cases there is no way to determine if a customer is purchasing them to enhance a product that was manufactured before or after the regulatory implementation date and therefore no way to determine if they must be compliant as a system.

Unlike the previous EPS-only legislation, allowing ‘grandfathering’ based on a date of manufacture prior to implementing the Proposed Standard is not a

solution for low-volume products, as the regulation impacts systems consisting of multiple products. Low-volume, high complexity products are not generally kept in inventory, so a ‘battery charging system’ will not be created significantly in advance of the sale date despite the possibility of having a lifetime supply of the EPS element available. Additionally, the predominant lithium-ion battery chemistry has a fairly short shelf-life without maintenance for both safety and performance reasons and would therefore not be suitable for stockpiling.

As demonstrated above, there are significant issues associated with implementing a battery charger standard for low-volume products in the professional and industrial test and measurement sector, and the costs cannot be recovered based on the associated energy savings. We therefore request that you remove these low-volume, non-consumer products from the scope of the Proposed Standard.

Respectfully,

Katt Fretwell
Product Environmental Compliance

Cc: Connie Goffe, Product Compliance Manager