



U.S. Department
of Transportation

1200 New Jersey Avenue SE
Washington, DC 20590

**Pipeline and Hazardous
Materials Safety
Administration**

AUG 29 2011

Mr. David Brongiel
Applications Engineering Manager
ICC Nexergy
4 Westbrook Corporate Center, Suite 900
Westchester, IL 60154

Ref. No.: 11-0143

Dear Mr. Brongiel:

This responds to your June 9, 2011 letter and subsequent telephone conversation with a member of my staff regarding the requirements in the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to a lithium battery pack. In your letter you describe a device that uses three 95 Watt-hour lithium ion battery packs, each of which consists of 24, 1.1 Ah cells in a 4S6P configuration. The three lithium ion batteries described in your letter are electrically connected within the device but utilize a microcontroller to ensure that the battery pack will not activate during transportation. Specifically, you ask if the configuration described in your letter may be considered separate lithium ion batteries under the HMR.

No. Since the three battery packs are electrically connected, the configuration described in your letter meets the definition of a battery as defined in section 38.3 of the United Nations Manual of Tests and Criteria. The definition states that a battery means one or more cells which are electrically connected together by a permanent means, including case, terminals and markings.

The lithium battery described in your letter exceeds the size requirements outlined in § 172.102, Special Provision 188. This battery pack may be transported in conformance with requirements in § 172.102, Special Provision 189 by highway or rail only and § 173.185 as Class 9 by highway, rail, vessel and aircraft.

I hope this answers your inquiry. If you need additional assistance, please contact the Standards and Rulemaking Division at (202) 366-8553.

Sincerely,

Ben Supko
Acting Chief, Standards Development
Standards and Rulemaking Division

Leary
§172.102
§173.185
Batteries
11-0143

Ben Supko
Office of Hazardous Material Standards
Pipeline and Hazardous Materials Safety Administration
U.S. Department of Transportation
1200 New Jersey Avenue, SE
Washington, DC 20590

June 9, 2011

Re: SPMU Lithium Ion Battery Design

Dear Mr. Supko:

I am writing this letter in regards to our lithium ion battery configuration in a power unit for portable ultrasound stand, known as the SPMU (Stand Power Management Unit). We would like confirmation from PHMSA that our current understanding of the battery configuration meets the requirements for the small battery exception in 49 CFR § 171.102, Special Provision 188 of the U.S. Hazardous Materials Regulations (HMR) and thus is exempt from the requirements of the HMR. Our current understanding is based primarily on the battery definitions in the UN Manual of Tests and Criteria, the regulatory requirements for lithium ion batteries found at 49 CFR § 173.185.

SPMU

The SPMU is a medical grade Stand Power Management Unit with universal AC input and provides +24VDC output, rated at 275W. The SPMU can be fitted with three optional lithium ion batteries. The SPMU charges the batteries while plugged into AC power. If AC power is removed from the SPMU, the SPMU automatically runs the system off of the battery packs.

Lithium Ion Batteries Designed for SPMU

ICCNexergy uses three 95Wh lithium ion batteries that consist of 24 1.1Ah cells in a 4S6P configuration. The batteries are still under development; however, they are being designed to be certified in accordance with the requirements of UN Manual of Tests and Criteria.

ICCNexergy will ship the batteries in a carton of three units to the customer, who would like to install the batteries in the SPMU prior to shipping the SPMU.

The batteries are installed in the SPMU by securely fastening them to an aluminum plate and held in place with a set of M5 screws.

The batteries ship from ICCNexergy in "shut-down" mode, which means the charge and discharge FETs are "off", and the battery is electrically isolated at its connector contacts. The batteries can "wake up" only when all three batteries have been installed in an SPMU, and the SPMU is connected to AC power.

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Phone: 708-836-3800 | Fax: 708-836-3801

If the SPMU is connected to AC power, the SPMU microcontroller will be active and can detect that all three batteries have been installed. Only after the SPMU microcontroller detects that all three batteries have been installed that the SPMU will apply a 12VDC charge voltage to the batteries to “wake” them up. At this time, the battery microcontrollers are now active, but the charge and discharge FETs remain “off”. The SPMU and batteries can now communicate via SMBus.

The battery charge and discharge FETs remain “off” until the SPMU provides an operational SMBus command to the batteries.

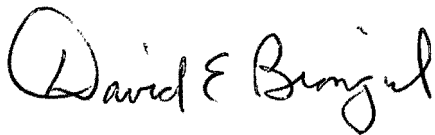
During preparation for shipment, the SPMU will not have AC power applied so that the batteries will always remain in the “shut-down” mode.

The three batteries are electrically connected together within the SPMU. That is, within the SPMU, all three batteries have the battery positive terminal connected together, and all three batteries have the battery negative terminal connected together. The batteries are isolated from each other via the batteries being in shut-down mode and their charge and discharge FETs being “off”. A diagram illustrating the SPMU battery system is enclosed with this letter.

In summary, we understand our battery design consists of three individual batteries that meet the requirements of the small battery exception found in 49 CFR § 171.102, Special Provision 188 of the U.S. HMR, and, when these batteries are installed in the SPMU and offered for transport, the SPMU also qualifies for the exceptions found in Special Provision 188 (provided the SPMU has not been plugged into AC power). We would appreciate written confirmation from PHMSA that our understanding of these lithium ion battery regulatory requirements is consistent with previous interpretation letters issued by PHMSA on this issue.

Thank you very much for taking the time to respond to our letter. Please feel free to contact me with any questions.

Sincerely,



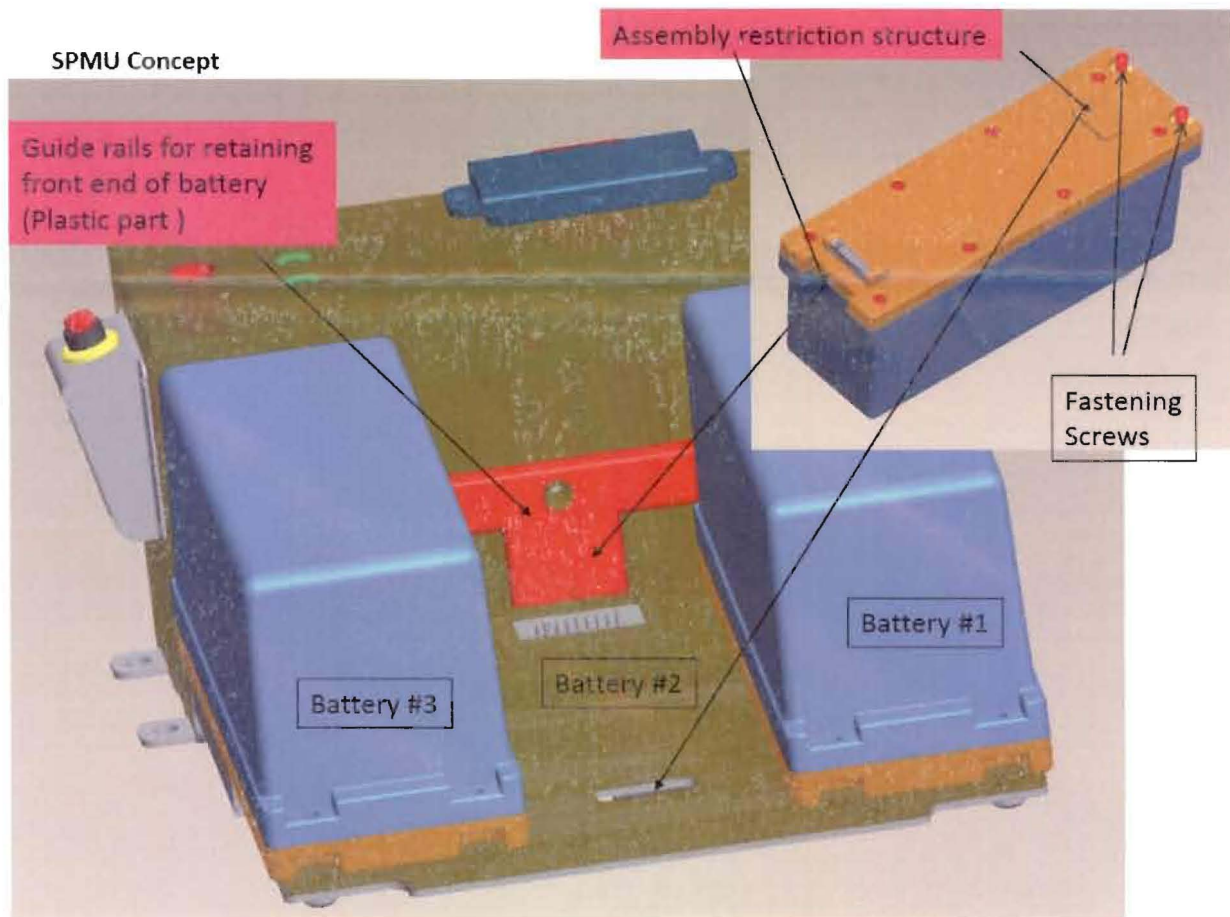
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China

Germany

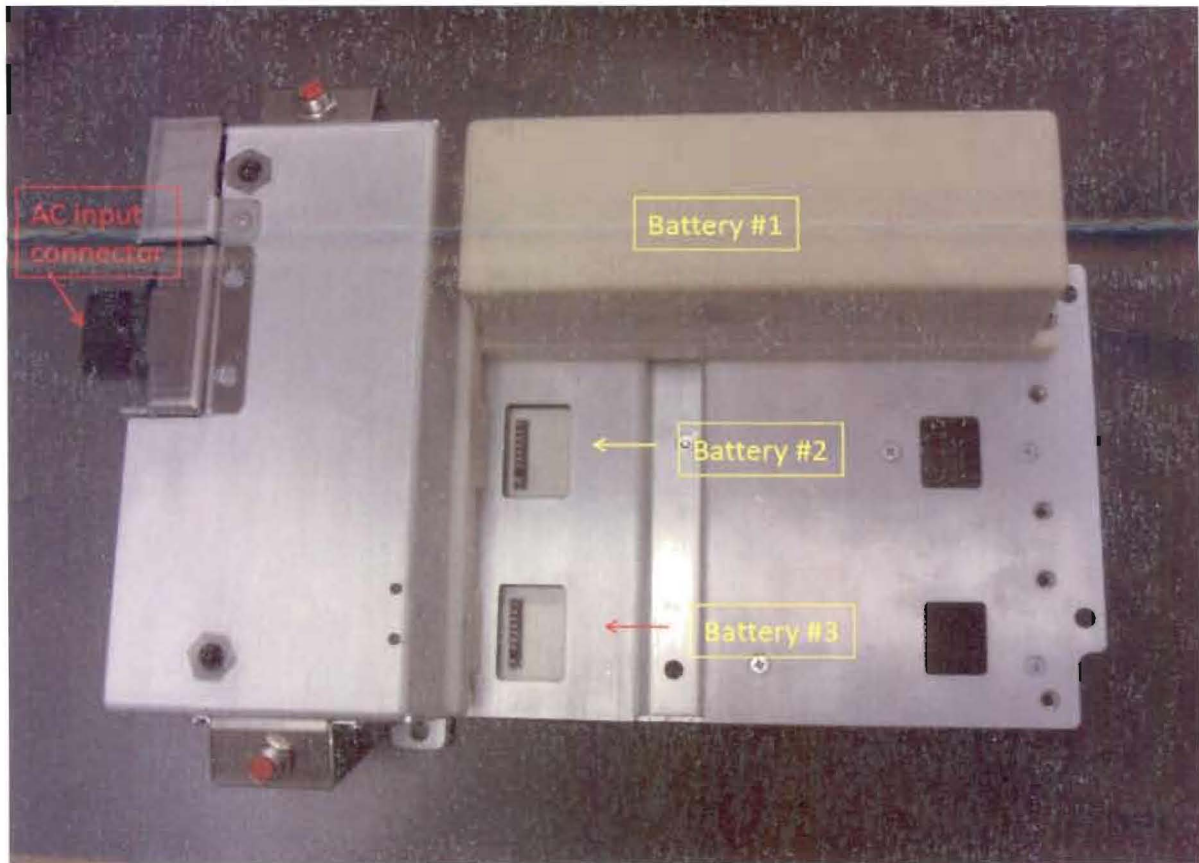
USA

Mexico

Hong Kong

United Kingdom

SPMU dummy sample with 1 battery installed



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China

Germany

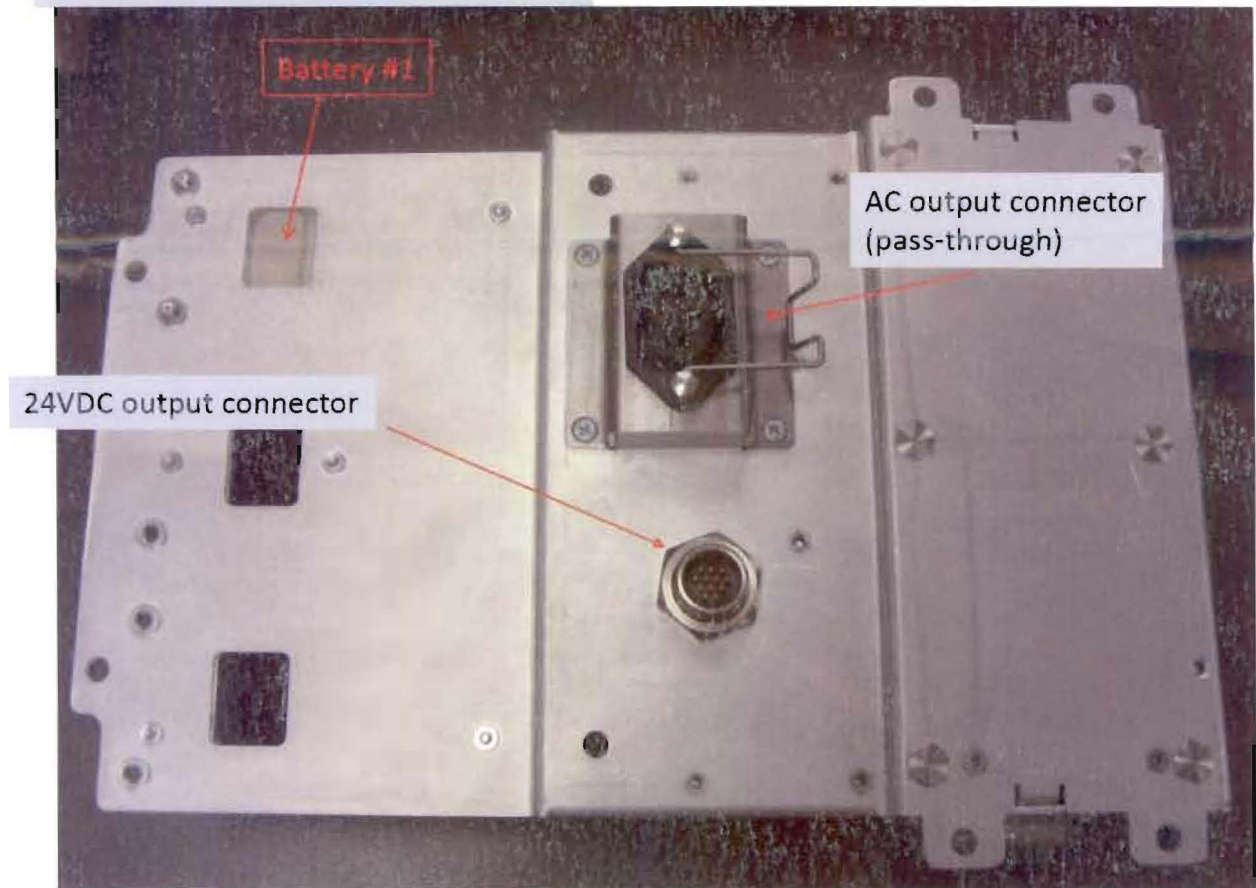
USA

Mexico

Hong Kong

United Kingdom

SPMU underside view:



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China

Germany

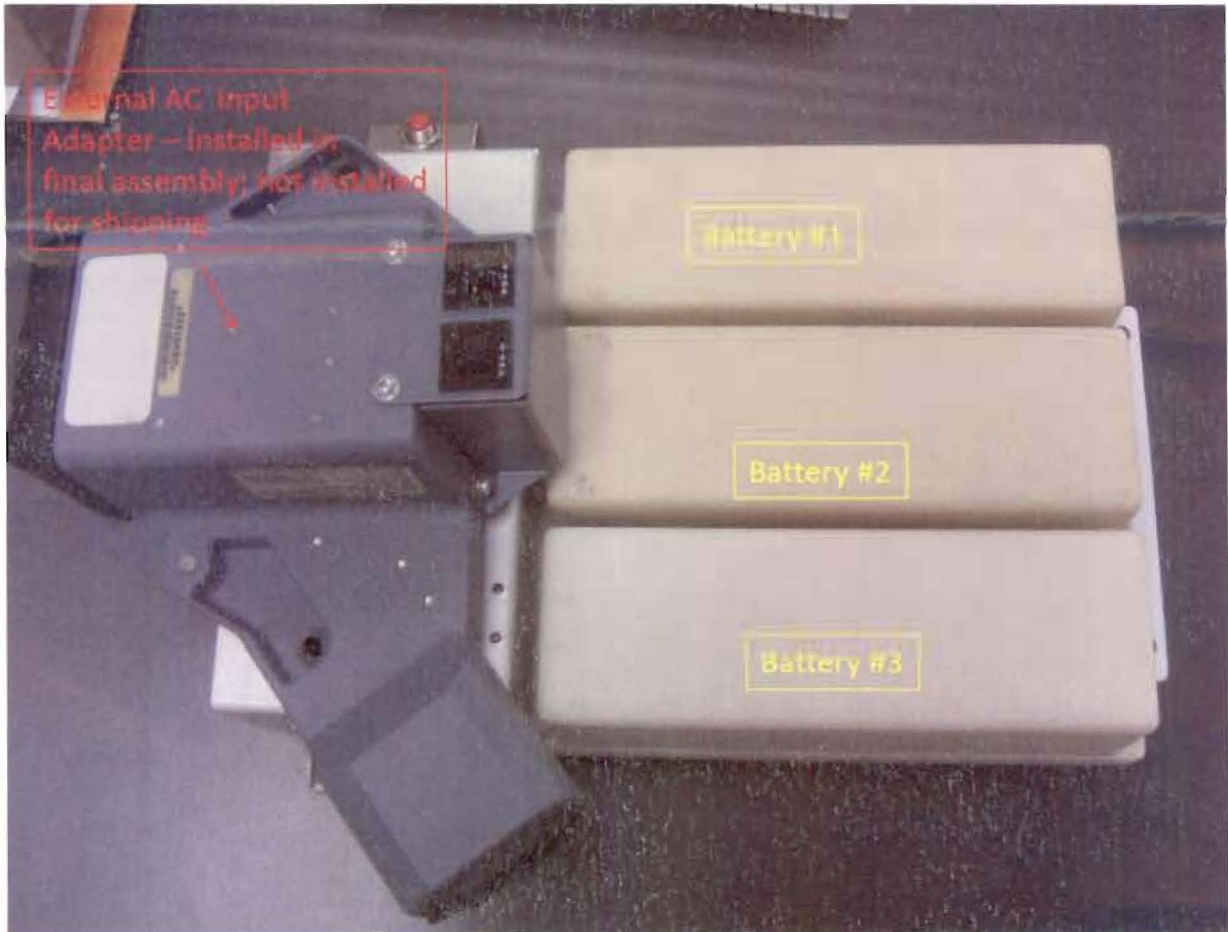
USA

Mexico

Hong Kong

United Kingdom

SPMU with all three batteries installed



End.