U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

OCT 15 2018

Judah Prero
Counsel
Sidley Austin LLP
1501 K Street NW
Washington, DC 20005

Reference No. 18-0105

Dear Mr. Prero:

This letter is in response to your July 11, 2018, email requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the classification of a lithium ion battery contained in a computer server power converter. You describe a power converter that functions to convert externally supplied electricity from an alternating current to direct current for the operation of a computer server. The power converter also contains a 32-volt (V) lithium ion battery to supply emergency power to the computer server in the event of external power failure. You ask whether the power converter with a lithium ion battery installed should be classified as "UN3480, Lithium ion battery" or "UN3481, Lithium ion battery contained in equipment" when it is shipped to the server assembler.

The power converter must be classified as "UN3480, Lithium ion battery" when shipped to the server assembler. For the purposes of lithium batteries, "equipment" is defined in § 173.185 as "the device or apparatus for which the lithium cells or batteries will provide electrical power for its operation." The battery's purpose in the converter is to supply emergency power to the computer server; thus, it must be transported using a proper shipping name that most appropriately describes the battery type housed in the power converter. However, once the power converter is installed into the computer server, the completed device, when transported, would be classified as "UN3481, Lithium ion battery contained in equipment."

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

Dirk Der Kinderen
Chief, Standards Development Branch
Standards and Rulemaking Division

Patrick
18-0105

January, Ikeya CTR (PHMSA)

From: Patrick, Eamonn (PHMSA)
Sent: Friday, July 13, 2018 9:00 AM
To: January, Ikeya CTR (PHMSA)
Subject: FW: Request for Interpretation
Attachments: PHMSA Letter 07112018.pdf

Hi Ikeya,
Please check in this attachment as a letter of interpretation and assign it to me. Thanks!

Eamonn

From: Prero, Judah [mailto:jprero@sidley.com]
Sent: Wednesday, July 11, 2018 11:52 AM
To: Patrick, Eamonn (PHMSA) <eamonn.patrick@dot.gov>
Subject: Request for Interpretation

Eamonn – got a better understanding of this equipment – but my client decided it wanted to submit a formal request for an interpretation. Attached, please find that letter. Can you please forward it to the appropriate individuals?

Thank you again!

Judah

JUDAH PRERO
Counsel

SIDLEY AUSTIN LLP
+1 202 736 8451
jprero@sidley.com

> **From:** Patrick, Eamonn (PHMSA) <eamonn.patrick@dot.gov>
> **Sent:** Monday, June 25, 2018 10:58 AM
> **To:** Prero, Judah <jprero@sidley.com>
> **Subject:** RE: Follow up
>
> Judah,
> I should be available most of the day.
>
> Eamonn

U.S. Department
of Transportation

**Pipeline and Hazardous
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Administration**

1200 New Jersey Avenue, SE
Washington, D.C. 20590

NOV 1 1 2012

Mr. Kendall Wilcox
Data Domain, BRS Division of EMC Corporation
2421 Mission College Blvd.
Santa Clara, CA 95054

Ref. No.: 12-0137

Dear Mr. Wilcox:

This responds to your June 24, 2012 letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the requirements for lithium batteries. In your letter, you describe a 7.2V battery pack that consists of two United Nations (UN) Manual of Tests and Criteria (UN 38.3) tested lithium ion cells connected in series. The battery pack itself has been tested under section 38.3 of the UN Manual of Tests and Criteria and incorporates protective circuitry. You install these battery packs in your systems, which incorporate a charging circuit. You state that there are between 3 and 6 battery packs on each system, each with its own identical charging circuit. The packs are connected in parallel to provide 7.2V power and are protected via fusing and diodes to prevent reverse currents between packs. In addition, the packs and charging circuits have been evaluated for compliance with UL2054 battery regulations. You ask if the final connected system, as shown in your attached diagram, must be evaluated to the UN 38.3 transportation test. If so, you ask whether every system needs to be tested or can a single system be used to represent all of them, assuming all of the protection circuitry is identical.

It is the opinion of this Office that in your scenario, each battery assembly, with different numbers of battery packs, would not require additional testing under UN 38.3. Based on your scenario, the final connected system you describe does not appear to be a battery assembly as described in UN 38.3(f). Under this section, the battery assembly is not required to undergo tests 3, 4, 5 and, in addition, test 7 in the case of a rechargeable battery assembly.

I hope this satisfies your inquiry. Please contact us if we can be of further assistance.

Sincerely,

T. Glenn Foster

T. Glenn Foster
Chief, Regulatory Review and Reinvention Branch
Standards and Rulemaking Division

SIDLEY

SIDLEY AUSTIN LLP
1501 K STREET, N.W.
WASHINGTON, D.C. 20005
+1 202 736 8000
+1 202 736 8711 FAX

AMERICA • ASIA PACIFIC • EUROPE

JPRERO@SIDLEY.COM
+1 202 736 8451

July 11, 2018

Mr. Dirk Der Kinderen
Chief, Standards Development Branch
Standards and Rulemaking Division
Pipeline and Hazardous Materials Safety Administration
United States Department of Transportation
1200 New Jersey Avenue
Washington, DC 20590

Re: Classification of power conversion equipment that contains batteries

Dear Mr. Der Kinderen:

I write to you on behalf of my client seeking clarification as to the Hazardous Materials Regulations ("HMR") classification of their product as "UN 3481, Lithium Ion Batteries contained in equipment."

My client manufactures what is essentially a power converter (the "Equipment") that is used in conjunction with computer servers. The Equipment functions to convert AC electrical charge provided by the electrical utility into a DC charge that is utilized to power the computer server. By itself, the Equipment provides no power; it merely functions to convert the power input to a usable current for the attached computer server. However, in order to address the circumstance where there may be a power failure and to ensure that the server may continue to operate, the Equipment also contains an emergency back-up battery. This battery is also connected to a converter. When the AC current provided by the electrical utility stops flowing due to a power failure, the emergency battery backup in the Equipment will be activated and its power will be converted and power the server until the regular power supply is restored. As mentioned, the Equipment is not intended to be a power source.

The enclosed attachment illustrates what the Equipment is and how it functions. In Figure 1, the small metal box in the rear left corner is the Equipment. The power source is connected to the back of this box. This box, which is approximately 12 in. x 7 in. x 1.5 in., is placed on the rear of a "tray." In the front of the tray is the server, comprised of processors and the printed circuit board. The box, which is the Equipment, is connected to the server. Approximately 30-40 of these server "trays" are placed in a cabinet, and these trays are connected to a computer network from the front of each tray.

Figure 2 illustrates how the Equipment functions. An AC electrical charge, as indicated by the solid black arrows, comes in through the rear of the Equipment (black box on lower left), then proceeds

through the converter, and then flows out as DC charge via a connector to the server. As discussed, there is also the emergency back-up battery, labelled as "8 Cell 32 V Battery," which is connected to a converter as well, and provides DC charge only when the regular power source is interrupted.

The Equipment is not a source of power and is not intended to function as a standalone source of power. Accordingly, it appears that, under the HMR, the Equipment could be appropriately classified as "UN 3481, Lithium Ion Batteries Contained in Equipment" as opposed to "UN 3480, Lithium Ion Batteries" when being shipped to the server manufacturer. We seek your clarification on this matter of classification.

Thank you for your assistance. Please let me know if any additional information is needed.

Sincerely,

Judah Prero

Attachment

Figure 1

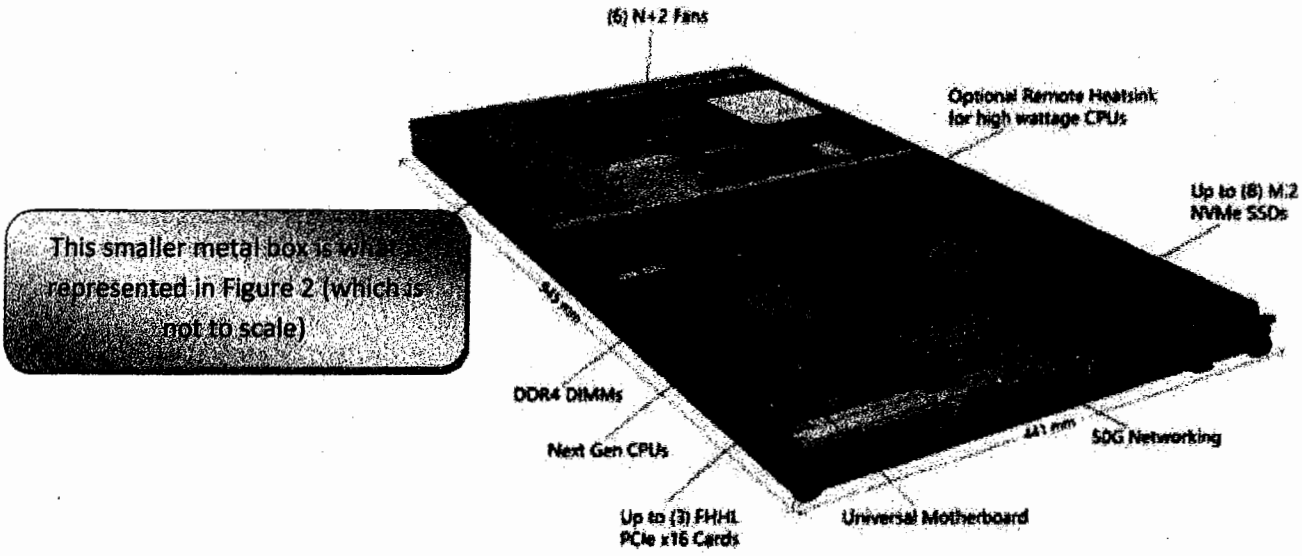
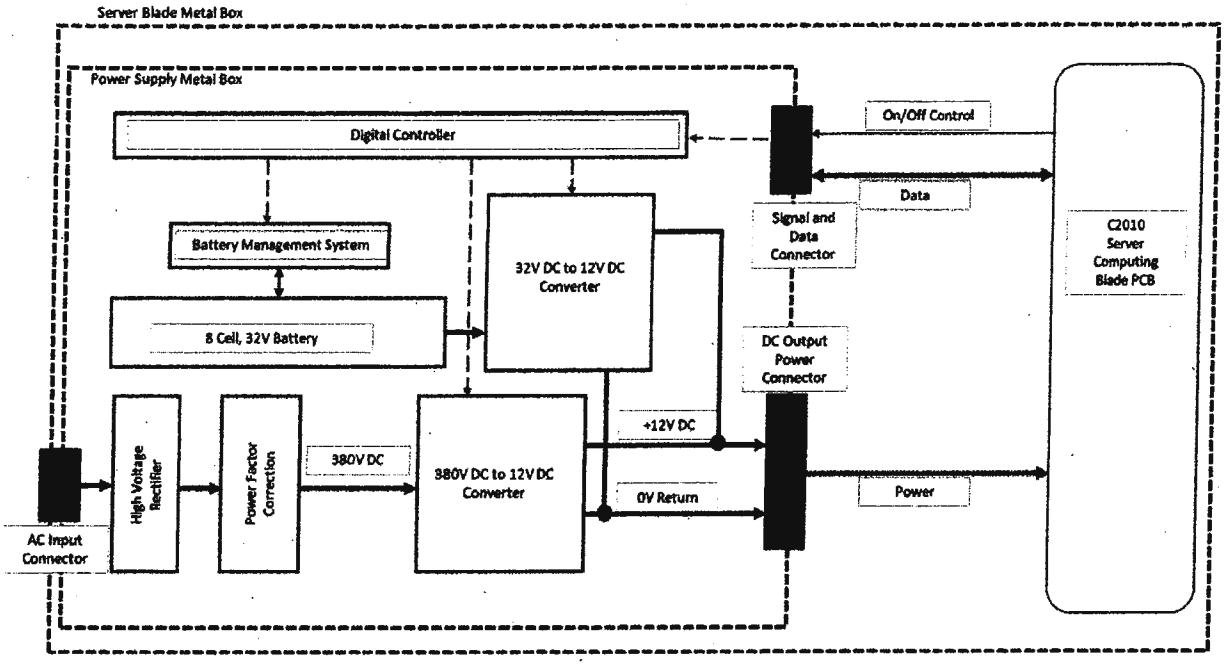

(6) N+2 Fans
Optional Remote Heatsink for high wattage CPUs
Up to (8) M.2 NVMe SSDs
This smaller metal box is what is represented in Figure 2 (which is not to scale)
DDR4 DIMMs
Next Gen CPUs
Up to (3) FHHL PCIe x16 Cards
Universal Motherboard
SDG Networking

Figure 2


Server Blade Metal Box
Power Supply Metal Box
Digital Controller
On/Off Control
Data
Battery Management System
32V DC to 12V DC Converter
Signal and Data Connector
C2010 Server Computing Blade PCB
8 Cell, 32V Battery
DC Output Power Connector
+12V DC
High Voltage Rectifier
Power Factor Correction
380V DC
380V DC to 12V DC Converter
0V Return
Power
AC Input Connector