



U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety  
Administration**

1200 New Jersey Avenue, SE  
Washington, DC 20590

**JUN 15 2018**

James Powell  
Transportation Development Group LLC  
2023 Sims Way, Suite 372  
Port Townsend, WA 98368

Reference No. 17-0080

Dear Mr. Powell:

This letter is in response to your July 27, 2017, letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to the transportation of lithium batteries contained in equipment. You describe several scenarios in which you ask whether a material would be classified as "UN3481, Lithium ion batteries contained in equipment."

We have paraphrased and answered your questions as follows:

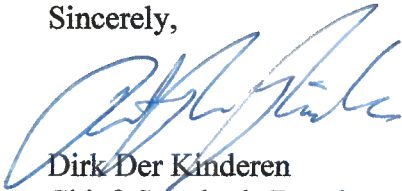
- Q1. You ask if a portable Wi-Fi router with a self-contained battery would be considered a lithium battery contained in equipment.
- A1. The answer is yes. The lithium battery installed in the router is for the primary purpose of providing electrical power for its operation; therefore, for the purposes of the HMR, it would be considered a lithium battery contained in equipment.
- Q2. A portable GPS, lamp, radio, and strobe-light are installed in the same metal casing and powered by a single lithium battery. You ask if this would be considered a lithium battery contained in equipment.
- A2. The answer is yes. See A1.
- Q3. A portable GPS, lamp, radio, and strobe-light are installed in a piece of hard-sided luggage and powered by a single lithium battery. You ask if this would be considered a lithium battery contained in equipment.
- A3. The answer is yes. See A1. The battery's primary purpose is still to provide electrical power to the devices; therefore, the piece of luggage containing the battery would be considered "equipment" for the purposes of the HMR.
- Q4. You ask if the piece of luggage referenced in Q3 (i.e., "smart luggage") can be considered, "UN3481, Lithium Ion batteries contained in equipment" when shipped as

cargo (regardless of power level) if it meets the applicable requirements of § 173.185. Furthermore, you ask if the addition of external USB ports changes that determination.

- A4. The answer is yes. See A1. The addition of external USB ports does not affect the classification of the material, provided the primary purpose of the luggage is not exclusively to provide electric power to another device.
- Q5. You describe a product called a "lithium generator" which consists of multiple lithium ion cells and an AC inverter with charging capability. You ask whether this product would be considered a lithium battery contained in equipment.
- A5. The answer is no. Based on your description, the product would not meet the definition of "equipment" because the primary purpose of the lithium generator is to provide electrical power to another device.
- Q6. You ask if a "lithium generator" equipped with solar panels that provide power to the generator would be considered a lithium battery contained in equipment.
- A6. The answer is no. See A4.

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

Ciccarone  
§ 173.185  
Definitions  
17-0080

**Dodd, Alice (PHMSA)**

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**From:** INFOCNTR (PHMSA)  
**Sent:** Tuesday, August 01, 2017 10:53 AM  
**To:** Hazmat Interps  
**Subject:** FW: Emailing - InterpretationRequestfor173185\_Equipment\_TDGLLC.pdf  
**Attachments:** InterpretationRequestfor173185\_Equipment\_TDGLLC.pdf

Hi Alice,

Please submit this as a letter of interpretation. Please let me know if you have any questions.

Thanks,  
Jodi

**From:** Powell, Jim [mailto:jim@dgtraining.com]  
**Sent:** Friday, July 28, 2017 8:43 PM  
**To:** PHMSA HM InfoCenter <PHMSAHMInfoCenter@dot.gov>  
**Cc:** support <support@dgtraining.com>  
**Subject:** Emailing - InterpretationRequestfor173185\_Equipment\_TDGLLC.pdf

July 28, 2017

Hello,

Attached is a request for a letter of interpretation seeking additional clarification on lithium battery issues.

Please let me know if there is anything else I need to do to submit this correctly.

Thanks

James Powell, DGSA, CDGP  
Transportation Development Group LLC  
1-808-280-6047 | 1-800-949-4834  
[jim@dgtraining.com](mailto:jim@dgtraining.com)



Transportation Development Group LLC  
2023 Sims Way, Ste 372  
Port Townsend, WA 98368-6905  
dgtraining.com 1-800-949-4834

July 27, 2017

Attn: PHMSA Interpretations Dept, [phmsa.hm-infocenter@dot.gov](mailto:phmsa.hm-infocenter@dot.gov)

My company provides training and consulting for Dangerous Goods Transport. We have had ongoing requests for clarification from our clients on certain lithium battery issues, and it seems that writing for an interpretation request is appropriate. I'm sure there are other requests out there that are similar in many ways to this one.

#### **Interpretation Request for 173.185 Definition of Equipment**

This request is for an interpretation of the scope of the word "equipment" as in the shipping description for UN3481, "Lithium Ion Batteries Packed with Equipment" or "Lithium Ion Batteries Contained in Equipment".

The second line of 173.185 offers this definition:

- *Equipment means the device or apparatus for which the lithium cells or batteries will provide electrical power for its operation.*

I would like you to consider these scenarios to determine if UN3481 is still appropriate in a couple of different examples.

✓ **Scenario 1: A portable wifi-router with a self-contained battery to power it. It seems clear that this should be considered "equipment".** Equipment could also include these examples:

- A portable GPS, a lamp, a radio, a strobe-light, all with self-contained lithium ion batteries, or maybe (in the case of a LED strobe light, a lithium metal battery).

We believe all of these items above would be construed as "equipment" containing a lithium battery required to provide power to those devices.

✓ **Scenario 1A: Now, what if all of these devices are installed in the same small metal casing and we use one 99.999 Wh lithium battery (so that we do not exceed the 100 Wh limit for "small" batteries), to provide a power-source for *all* these devices together at the same time and they no longer use a discrete power source for each. So it seems that this is still defined as a piece of "equipment" with a wi-fi, radio, lamp, strobe and GPS, under UN3481.**

✓ **Scenario 1B:** What if instead of a metal casing all these devices are properly installed in a piece of hard-sided luggage. While we know that “luggage” is performing a non-electric function, it still seems to be UN3481, Lithium Ion Batteries Contained in Equipment.

**Scenario 1C:** Does adding USB external power ports to the “equipment” change anything? The luggage still has the radios and the lights that require one lithium battery. With a 99.999 Wh battery we may have enough power to run for days, but it’s still the minimum number of batteries required to run at all. Plugging devices into the equipment’s USB port doesn’t change the *number* of batteries needed, only the length of runtime of the electronics within.

**Question 1 for the DOT:**

Question 1A: Does it matter whether the electronic devices (GPS, Wi-Fi, Strobe Light, Lamp) are installed in a housing containing just those devices to be considered “equipment?” Or as long as the equipment meets the packaging requirements of 173.185 and any general packing requirements, it wouldn’t matter from a transport perspective whether these are housed in a metal cabinet or a piece of luggage.

Question 1B: Assuming the answer to 1A is “no” it doesn’t matter that properly installed electronic devices and the battery that powers them are installed in something else that serves another purpose (i.e luggage). Does the power rating of the battery matter as long as it’s at or below the 100 Wh limit of “small” batteries?

49 CFR [173.185(c)(4)(iv)] requires: *For lithium batteries packed with, or contained in, equipment, the number of batteries in each package is limited to the minimum number required to power the piece of equipment, plus two spares...*

The HMR doesn’t say anything about the power level (if 100 Wh or less) in equipment, only the number of batteries. One battery could run the devices contained within for seconds, minutes, hours or days just depending upon the power-rating of that one battery which is always going to be 100 Wh or less.

**Scenario 2: Different Product. A “Lithium Generator”.**

**What if we have a fifty-pound, 1,000 Wh “lithium generator?”**

The lithium generator is really just multiple lithium ion cells and an AC inverter with charging capability. So it seems clear that this would be UN3480, Lithium Ion Batteries, and not “equipment”. Some have argued that no, a lithium generator is actually “equipment” because in addition to the DC batteries, there’s AC inverter equipment installed, and then we could start adding additional devices to it. So two questions come up:

Question 2A: Is a one-thousand (1000) watt-hour lithium battery with an onboard inverter still considered to be a battery and not “equipment”.

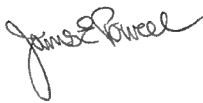
Question 2B: What if this lithium generator were shipped with solar panels that provide power to the generator? This would still seem to be a *battery* under UN3480 because the “generator” isn’t providing power to the panels, it is vice-versa. The battery is receiving power FROM the panels. So that would still seem to be a battery and not “equipment”.

Question 2C: **Is there anything in the HMR or elsewhere that addresses the issue of “function” or “primary function”.** A giant battery with a five-cent LED light doesn’t really change its primary function from UN3480 to UN3481 but there is no shortage of examples that could rapidly blur the lines between “batteries” and “equipment”. We could start adding additional functionality that takes the battery beyond its power-supplying function. What if we added radios (GPS transceiver, Bluetooth, Wi-fi, an emergency-alert weather-radio, and emergency locator beacon) to the generator and maybe even a heating coil to cook something? When would it become “equipment” and not just a battery?

You can carry this to an absurd extreme, but the question is still the same – **when does a lithium battery that takes on additional functionality transition from UN3480 to UN3481 “Lithium Ion Battery Contained in Equipment?”**

In closing this letter, I’d like to circle-back to the luggage issue, it would seem that so-called “Smart Luggage”, when shipped as cargo (we are **not** talking about Part 175 passenger considerations of carry-on or checked baggage of a passenger or crew), can such cargo be considered “UN3481, Lithium Ion Batteries, Contained in Equipment” regardless of the power-level as long as there are the minimum “Number” of batteries as required by 173.185. If we had external USB ports fitted to the equipment, so that it could, if needed, provide power to other devices, would this change anything? We’re not changing the number of batteries, and it’s still 100 Wh or less.

Sincerely,



James Powell, DGSA, CDGP  
Transportation Development Group LLC  
1-808-280-6047 | 1-800-949-4834

[jim@dgtraining.com](mailto:jim@dgtraining.com)