



U.S. Department  
of Transportation

**Pipeline and Hazardous  
Materials Safety  
Administration**

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

FEB 25 2014

Mr. Andrew N. Romach  
Regulatory Compliance Manager  
URS Corporation  
1600 Perimeter Park Drive  
Suite 400  
Morrisville, NC 27560

Reference No.: 13-0124

Dear Mr. Romach:

This is in response to your June 14, 2013 letter requesting clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). You ask several questions pertaining to § 173.189, concerning the requirements that apply when shipping UN3292, Batteries containing sodium.

Your questions are paraphrased and answered as follows:

Q1. Section 173.189(d) provides the requirements for batteries containing liquid sodium and paragraph (d)(4)(iii) states that no other hazardous materials, with the exception of cells containing sodium, may be loaded in the same transport vehicle or freight container. Can batteries containing liquid sodium be shipped together in the same transport vehicle or freight container with batteries containing sodium in solid form?

A1. The answer is yes. Batteries containing liquid sodium and batteries containing solid sodium are assigned the same identification number and proper shipping name.

Q2. Section 173.189(e) states vehicles, machinery and equipment powered by sodium batteries must be consigned under the entry "Battery-powered vehicle or Battery-powered equipment." The requirements for "Battery-powered vehicle" or "Battery-powered equipment" are provided in § 173.220. Would a vehicle, machinery, or equipment powered by a battery containing liquid sodium (where the battery is the only power source) be eligible for the exception in § 173.220(c) and shipped as "not-restricted" when transported by rail, highway or vessel?

A2. Yes, if all of the requirements described in § 173.220(c) are satisfied, the vehicle, machinery, or equipment powered by a battery containing liquid sodium is not subject to the requirements of the HMR except for those described in § 173.21.

Q3. May vehicles, machinery, or equipment powered by batteries containing liquid sodium that are excepted from further requirements of the HMR in accordance with § 173.220(c) be

transported in the same transport vehicle or freight container as disconnected or uninstalled batteries containing liquid sodium?

A3. Yes, provided the vehicles, machinery, or equipment powered by batteries containing liquid sodium contain no additional materials meeting the definition of a hazardous material.

Q4. If a sodium battery installed in a vehicle, machinery, or equipment where the sodium battery is not the only power source (the vehicle, machinery, or equipment is also powered by liquid or gas fuel in a hybrid application), what is the proper shipping name?

A4. As stated in § 172.102(c), Special Provision 134, the following proper shipping names would most appropriately describe a sodium battery installed in a hybrid application: "Vehicle, flammable gas powered", "Vehicle, flammable liquid powered", "Engine, internal combustion, *flammable gas powered*", or "Engine, internal combustion, *flammable liquid powered*."

Q5. Could a sodium battery contained in a battery/fuel powered hybrid application be shipped as "not restricted" for transportation by motor vehicle or rail car if the requirements of the exception in § 173.220(c) are met, as well as the requirements under § 173.220 (h)(1) for the fuel, even though such a scenario is not listed in § 173.189(e)?

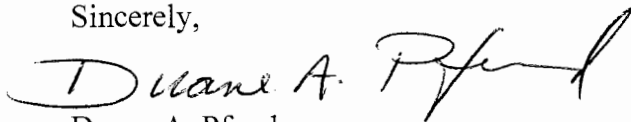
A5. The answer is yes. The proper shipping names described in (A4) above, applicable to sodium batteries installed in hybrid applications reference § 173.220 for packaging exceptions.

Q6. When shipping batteries containing liquid sodium; if § 173.189(d)(2) states that no battery may be offered for transportation if the temperature at any point on the external surface of the battery exceeds 55 °C (130 °F), then why is there a separate less restrictive limit described in § 173.189(d)(4)(ii) stating that adequate ventilation and/or separation between batteries must be provided to ensure that the temperature at any point on the external surface of the battery casing will not exceed 240 °C (464 °F) during transportation?

A6. Section 173.189(d)(2) addresses the surface temperature of a battery when offered for transportation. Section 173.189(d)(4)(ii) addresses the concern of multiple batteries containing liquid sodium transported in close proximity with each other which could result in one battery heating another to an even higher temperature. In this case, paragraph (d)(4)(ii) requires ventilation and/or separation to prevent heat generated from multiple batteries from reaching a dangerous temperature.

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

Sincerely,



Duane A. Pfund  
International Standards Coordinator  
Standards and Rulemaking Division



June 14, 2013

Wiener  
§ 173.189  
§ 173.220  
Batteries  
13-0124

Mr. Charles Betts, Division Director  
Standards and Rulemaking (PHH-10)  
U.S. Department of Transportation  
Pipeline and Hazardous Materials Safety Administration  
East Building, 2nd Floor  
1200 New Jersey Ave., SE  
Washington, DC 20590

Dear Mr. Betts:

I am writing to request written regulatory clarification concerning the requirements that apply when shipping “hot” sodium batteries (batteries that contain liquid sodium). My questions are summarized below:

Q1. Batteries containing liquid sodium (“hot” batteries) are required to meet the requirements set out in 49 CFR 173.189(d)(4)(iii): *“When loaded into a transport vehicle or freight container: No other hazardous materials, with the exception of cells containing sodium, may be loaded in the same transport vehicle.”* Do the Hazardous Material Regulations (HMR) allow “hot” sodium batteries to be shipped together in the same transport vehicle or freight container with sodium batteries that are cold [batteries sufficiently cooled such that they are not subject to paragraph (d)]? As both hot and cold sodium batteries are assigned the same UN number and proper shipping name, it would appear that both of these hazardous materials would be allowed to be transported together. As hot sodium batteries are expected to cool during transport, if several hot batteries are transported in a transport vehicle or freight container, there is the potential that upon reaching the destination, some batteries may be hot and some may be cold.

Q2. A set out in 49 CFR 173.189(e): *“Vehicles, machinery, and equipment powered by sodium batteries must be consigned under the entry “Battery-powered vehicle or Battery powered equipment.”* The requirements in 49 CFR 173.220 (which are referenced in the Hazardous Material Table (HMT) for the proper shipping name *“Battery-powered vehicle or Battery powered equipment”*) do not set out separate requirements for sodium batteries containing liquid sodium (“hot” batteries). Would a vehicle, machinery, or equipment powered by a “hot” battery (where the battery is the only power source) be able to take advantage of the exception set out in 49 CFR 173.220(c); and, if all of the applicable requirements are met, be shipped as Not Restricted by rail, highway, or vessel?

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DOT interpretation letter request  
June 14, 2013

Because the “hot” sodium battery is contained in the vehicle, machinery, or equipment, would the requirements set out in 49 CFR 173.189(d) be applicable to this shipping scenario?

Q3. If a “hot” sodium battery is allowed to be shipped contained in a vehicle, machinery, or equipment (where the battery is the only power source) as Not Restricted (Question #2 above), would a vehicle, machinery, or equipment powered by a “hot” sodium battery be allowed to be transported in the same transport vehicle or freight container as “hot” sodium batteries? It would appear that the vehicle, machinery, or equipment containing a “hot” sodium battery could be shipped in the same freight container or transport vehicle as the “hot” batteries, because the vehicle, machinery, equipment is not subject to the HMR and, therefore, does not meet the definition of a “hazardous material.”

Q4. If a “hot” or cold sodium battery is contained inside of a vehicle, equipment, or machinery where the battery is not the only power source (the vehicle, equipment, or machinery is also powered by liquid or gas fuel in a hybrid application), that scenario is not addressed in 49 CFR 173.189(e). However, shipment of sodium batteries contained in a vehicle, equipment, or machinery is addressed in 49 CFR 173.220.

Considering the vehicle, equipment or machinery in which the battery is installed and the type of fuel present, it appears that the appropriate proper shipping name would be selected from one of the following:

- Vehicle, flammable gas powered
- Vehicle, flammable liquid powered
- Engines, internal combustion, *flammable gas powered*
- Engines, internal combustion, *flammable liquid powered*

These proper shipping names also reference 49 CFR 173.220 for shipping requirements. Could a sodium battery contained in a battery/fuel powered hybrid application be shipped as Not Restricted for transportation by motor vehicle or rail car if the requirements of the exception in 49 CFR 173.220(c) are met, as well as the requirements of 49 CFR 173.220(h)(1) for the fuel, even though such scenario is not listed in 49 CFR 173.189(e)?

Q5. When shipping “hot” sodium batteries: If there is a limit set out in 49 CFR 173.189(d)(2) whereby “No battery may be offered for transportation if the temperature at any point on the external surface of the battery exceeds 55°C (130°F),” why is there a separate, less restrictive limit in 49 CFR 173.189(d)(4)(ii) which requires “Adequate ventilation and/or separation between batteries must be provided to ensure that the



DOT interpretation letter request  
June 14, 2013

temperature at any point on the external surface of the battery casing will not exceed 240°C (464°F) during transportation”?

I would appreciate your assistance with these questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew N. Romach".

Andrew N. Romach  
Regulatory Compliance Manager  
URS Corporation