



August 27, 2020

VIA EMAIL

Mr. Howard "Skip" Elliott
Administrator
U.S. Department of Transportation
Pipeline and Hazardous Materials Safety Administration
1200 New Jersey Avenue, SE
Washington, DC 20590

Re: NTSB Recommendations A-20-31 and A-20-32

Dear Mr. Elliott:

Our Association is recognized globally as the premier battery trade association with expertise on the transport of lithium batteries by all modes of transport. I write to express our strong opposition to the recently issued National Transportation Safety Board (NTSB) Recommendations A-20-31 and A-20-32 contained in the Agency's *Safety Recommendation Report Standards for Lithium-Ion Battery Shipments by Air*. These NTSB Recommendations purport to address "gaps in the existing [lithium battery air transport] regulations" relating to prototype and low production lithium batteries.

As explained below, this is not correct. The Recommendations mischaracterize the incident that resulted in them and fail to recognize the effectiveness of current requirements, when they are complied with. Furthermore, if implemented by PHMSA and the International Civil Aviation Organization (ICAO), the Recommendations would prevent our members from operating their businesses on a global scale and developing the latest lithium battery technologies; endanger the safety of medical patients who depend on life-saving lithium batteries to power their medical devices; and jeopardize the ability of the United States military from meeting its obligations—domestically and internationally—and protecting men and women in combat who often rely on equipment powered by lithium batteries.

If the Recommendations are adopted by the International Civil Aviation Authority (ICAO) and the U.S. Department of Transportation (DOT), prototype and low production lithium batteries would be prohibited as cargo on aircraft. We respectfully request that you reject these Recommendations and instead share with members of the ICAO Dangerous Goods Panel the technical and regulatory expertise your agency has acquired over the past thirty years about how competent authority approvals can be safely issued to authorize the transport of prototype and low production lithium batteries by air.

BACKGROUND

PRBA was formed in 1991. Today our members manufacture approximately 65% of the rechargeable lithium ion battery cells produced in the world, as well as many non-rechargeable lithium metal and other

types of batteries. PRBA members also include leading manufacturers of consumer, medical, automotive, aerospace, industrial, critical grid support, and military products that are powered by lithium batteries.

Our members have a strong commitment to battery innovation and safety and for decades have played a leadership role in addressing these issues domestically and internationally. Simply put, the number one priority for all our members is the safe transport of lithium batteries. PRBA thus has consultative status as a non-governmental organization with the United Nations Sub-Committee of Experts on the Transport of Dangerous Goods, and we often participate in meetings of the ICAO Dangerous Goods Panel Working Group. Furthermore, our members have safely shipped billions of lithium batteries and equipment powered by lithium batteries. Some of these shipments included prototype and low production lithium batteries transported by air.

As explained below, innovation and the ability to ship new battery designs by air for evaluation and testing is a critical component of all successful lithium battery manufacturers, especially small U.S. businesses who are competing with off-shore, low-cost battery manufacturers.

NTSB Recommendations and the June 3, 2016 Battery Incident

The NTSB's Recommendations A-20-31 and A-20-32 were issued after that agency investigated an incident involving a shipment of prototype or low production lithium ion batteries that had been shipped by a battery manufacturer who failed to comply with nearly all of the requirements in the U.S. lithium battery hazardous materials regulations (HMR) and the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air. These requirements include applying for and securing a written approval or special permit from PHMSA to authorize the air transport of prototype and low production lithium batteries. ("Prototype" and "low production" lithium batteries are generally recognized as batteries that have not been tested in accordance with Sub-section 38.3 of the UN Manual of Tests and Criteria.)

Had the battery manufacturer involved in the June 3, 2016 incident secured the necessary special permit, it would have been subject to the following packaging, testing, FAA inspection, and reporting requirements:

- 30% state of charge limit on the batteries
- Non-combustible, Packing Group I metal outer packaging
- Non-combustible, non-conductive cushioning material inside the outer packaging
- An external short circuit test on the battery design
- FAA inspection of their facility and hazardous materials program
- Biannual reporting on shipments

These requirements are mandated by PHMSA's special permits and approvals and provide the equivalent level of safety to ensure prototype and low production lithium batteries are safe for transport. It is also likely the external short circuit test mandated by PHMSA would have revealed the manufacturing defects in the battery design involved in the June 3, 2016 incident and prevented it from being transported in the first place.

The NTSB's Hazardous Materials Accident Brief on the June 3, 2016 incident provides a detailed post-accident examination and testing data on the battery design that was involved in the incident. The Brief shows the battery design did not include the most basic of safety features, such as a battery management system. Such systems play a critical role in keeping cells within the battery balanced during charging and

discharging, preventing cell overvoltage and short circuits, and maximizing battery safety performance. The NTSB concluded in its Brief that the probable cause of the incident was an electrical short circuit between the battery terminal bolt and the upper cells of the lithium ion battery, causing a thermal runaway event that ignited the battery and its packaging. In addition, the NTSB noted the battery design did not protect against short circuiting utilizing a battery management system, and the use of combustible packaging material contributed to the incident.

In short, the battery manufacturer's failure to comply with the U.S. HMR and ICAO Technical Instructions, combined with the poor design of the battery, led to this incident.

Shipments of Prototype and Low Production Lithium Batteries by Air

Prototype and low production lithium batteries are often shipped by motor vehicle or cargo vessel because of the costs associated with air transport and the challenges of securing the required regulatory approvals needed for air shipments. However, battery manufacturers and their customers sometimes ship prototype and low production lithium batteries by air to meet time-sensitive deadlines. This has been particularly true during the current COVID-19 pandemic when prototype lithium batteries have been needed for testing in new ventilator designs.

There are many other reasons for shipping prototype and low production lithium batteries by air:

- It is very common for battery manufacturers to ship new lithium battery designs to their customers (and potential customers) before conducting the mandated UN38.3 lithium battery tests. This enables a customer to evaluate the performance and quality of the new battery design. This is particularly relevant for U.S. battery manufacturers who often compete for business overseas. The only practical way to ship prototype lithium batteries to these potential customers is via air transport.
- Prototypes are shipped to third-party labs for abuse and performance testing to meet industry, military, aerospace, or medical standards. The labs that conduct these tests may be located in a different country from the one in which the cells or batteries are manufactured.
- Global battery manufacturers with facilities in different countries often produce prototype lithium cells at one location and ship them for assembly into a prototype lithium battery at their facility located in another country. This frequent scenario reflects the fact that different manufacturing locations may each specialize in different lithium chemistries or cell and battery designs.
- Lithium batteries are used in many types of military equipment such as bomb-detecting robots, radios, and military vehicles. New lithium battery designs are always being developed to improve on the operation of the equipment and vehicles and therefore prototype lithium batteries are frequently shipped to the military for testing.
- Field testing of prototypes is very common. For example, prototype lithium batteries installed in military equipment, medical devices, portable electronic devices, and automobiles are often shipped for field testing to evaluate the performance of the battery in real-world conditions.

All of this prototype and low production lithium battery testing must be conducted before a company commits to the battery design and mandatory UN38.3 testing. This testing can take 6 to 12 weeks to complete at a cost of up to \$50,000, depending on the size and design of the cells and batteries.

U.S. DOT Special Permit 20323

One of the Findings in the NTSB’s Safety Recommendation Report states that PHMSA’s special permit SP 20323 process “does not require sufficient testing and evaluation of low-production or prototype batteries for thermal hazards compared to that which is provided under United Nations Manual of Tests and Criteria, Part III, Sub-section 38.3 testing, which simulates transportation conditions and, therefore, does not provide an equivalent level of safety.” We must respectfully disagree with this statement.

According to data collected and compiled by PHMSA, 136 prototype or low production lithium battery shipments have been made under SP 20323 without incident since the permit was first issued in January 2017. There are many approvals (*e.g.*, CA2011020014, CA2010060082, CA2012060011, CA2009040006, CA2011020022, CA2010060090, CA2010060093, CA2011020030, CA2010060089, CA2013040015, CA2003100024) issued by PHMSA that also include the same packaging, testing, and shipping requirements as SP 20323. **We are not aware of a single incident involving any shipments made under these similar approvals.**

We are confident other countries, who have issued approvals for prototype and low production lithium batteries, such as the United Kingdom and Germany, have had similar experiences. That is, the approvals they have issued that authorize the transport of prototype and low production lithium batteries by air have not resulted in any incidents in transport. We strongly encourage PHMSA to request data from these other countries to evaluate their safety records.

We share NTSB’s concern that the transport of lithium batteries by air be safe. We must, however, emphasize our strong opposition to NTSB’s Recommendations A-20-31 and A-20-32. One company’s failure to comply with the U.S. and international lithium battery air transport regulations and its poor battery manufacturing and design capabilities does not justify amending the regulations or claiming there is a “gap” in the existing lithium battery regulatory structure. Such actions would unfairly punish companies who continue to take all the necessary steps to comply with U.S. and international lithium battery air transport regulations and ensure their prototype and low production lithium batteries are safe for transport.

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We very much appreciate this opportunity to share our concerns with you regarding these NTSB Recommendations and look forward to your response. I can be reached at 202.719.4109 or gkerchner@wiley.law.

Thank you.

Sincerely,

George Kerchner
Executive Director

cc: Stephen Dickson, FAA Administrator
Elaine Chao, Secretary of Transportation