



October 14, 2021

Honorable Pete Buttigieg  
Secretary  
U.S. Department of Transportation  
1200 New Jersey Ave, SE  
Washington, DC 20590

Re: Proposed Changes to Dangerous Goods Transport Regulations Impacting Shipments by Air of Portable Electronic Equipment and Electric Vehicles Powered by Lithium ion Batteries

Dear Secretary Buttigieg:

We write today to express our concerns with several proposals that have been filed with the International Civil Aviation Organization Dangerous Goods Panel (“ICAO DGP”) that will significantly impact how lithium ion battery-powered products would need to be shipped by air as early as January 1, 2023. These costly and impractical proposals are neither necessary nor supported by relevant data and fail to account for the negative public health impacts if they are adopted. For the reasons explained below, we respectfully request that the U.S. Department of Transportation (“DOT”) oppose these proposals at the ICAO DGP meeting that is scheduled for the week of November 15 – 20, 2021. As always, our members – many of whom participate in the federal Lithium Battery Air Safety Advisory Committee – stand ready to collaborate with the DOT and other stakeholders on data-based proposals to improve on the safe transport of lithium ion batteries.

## Background

The undersigned manufacturers, retailers, carriers, wholesalers, exporters, importers, and industries who rely on the safe transport of lithium ion batteries strongly support the

promulgation of tough, protective, and internationally consistent regulations governing the air transportation of lithium ion batteries and products powered by these batteries, when it is based on technically sound test data and comprehensive, thorough regulatory analysis. We have been made aware of six proposals that have been filed with the ICAO DGP that would significantly change how lithium ion batteries and products powered by these batteries would need to be packaged and offered for air transport in accordance with the ICAO Technical Instructions on the Safe Transport of Dangerous Goods by Air (“ICAO TI”) – without any corresponding safety benefits and supporting data. These proposals have been filed by the International Federation of Air Line Pilots’ Association (IFALPA), and their inappropriateness is further addressed below.

## **IFALPA Proposals**

IFALPA is proposing to require lithium ion batteries that are packed with or contained in equipment, or installed in vehicles, be shipped at “at the lowest practical state of charge, but not exceeding 30 percent.”

**There is no test data to support a regulation to limit the state of charge for properly packaged air shipments of lithium ion batteries in products or vehicles.** While we recognize the Federal Aviation Administration (“FAA”) conducted tests between 2010 and 2015 on standalone lithium ion batteries – that is, batteries packaged *without* equipment or installed in vehicles – the FAA has not conducted tests on lithium ion batteries packed with or contained in equipment, or installed in vehicles, nor has IFALPA offered any such technical test data to support their proposal.

The packaging of lithium ion batteries contained in equipment is significantly different than for standalone lithium ion batteries. In particular, properly packaged air shipments of the batteries in products includes placing the battery in the product, placing the product in an enclosure, and placing the enclosed product in external packaging, resulting in space and layers that provide protection from a thermal event and, in turn, thermal runaway propagation.

We are aware of one FAA-style published report and test data on lithium ion batteries packed with or contained in equipment. It was commissioned in 2010 by PRBA – The Rechargeable Battery Association in response to a lithium battery rulemaking (HM-224F) from the Pipeline and Hazardous Materials Safety Administration (“PHMSA”). The report, *US FAA-Style Flammability Assessment of Lithium-Ion Batteries Packed With and Contained In Equipment (UN3481)*, was prepared by the widely-respected consulting firm Exponent. The report includes data from fire testing on notebook computers with and without lithium ion batteries. The data show, among other things, that the presence of the lithium ion batteries at approximately 50 percent state of charge had no discernible effect on the overall heat release during the testing period. Additionally, even during battery initiation testing, packages containing lithium ion batteries and equipment did not produce a significant event in the test chamber.

## **IFALPA’s Proposal Would Have a Significant Impact on United States Industries and Global E-Commerce**

To meet the proposed new state of charge requirement, manufacturers and distributors of

portable electronic equipment and electric vehicles would need to both modify manufacturing and shipping processes and completely change how they bring product to market. To fully appreciate the value and quantity of products impacted by IFALPA's proposals and the economic impact it could have on United States industries, we have compiled applicable import and export trade data from the United States Bureau of the Census and our members.

In 2020, portable electronic equipment powered by lithium ion batteries (UN3481) imported into the United States by air were valued at \$126.4 billion. Exports by air were valued at \$26.4 billion.<sup>1</sup> These imports and exports represent approximately 713,000,000 pieces of equipment that could be impacted by these IFALPA proposals.<sup>2</sup> These values and the quantity of products impacted do not include domestic shipments by air within the United States.

The proposed state of charge changes will create monumental operational changes and financial burdens throughout industry supply chains, including but not limited to changing packaging and charging to mitigate product quality and reliability issues. These changes will cause production and shipment delays, as well as an increase in carbon emissions. On a global scale, retail e-commerce was valued at \$3.9 trillion in 2020.<sup>3</sup> Because many consumers and businesses receive e-commerce air shipments consisting of electronic equipment powered by lithium ion batteries (UN3481), it is difficult to quantify on a global scale the number and value e-commerce air shipments that could be impacted by IFALPA's proposal. However, based on our initial research and limited information available to us, we estimate that at least 70 billion shipments of electronic equipment powered by lithium ion batteries (UN3481) could be affected annually by this change in the ICAO TI if IFALPA's proposals are adopted by the ICAO DGP, although this number is likely significantly understated.

Requiring lithium ion batteries in portable electronic equipment to be shipped at "the lowest practical state of charge, but not exceeding 30 percent" will also have a negative impact on product quality and reliability. Equipment can take several weeks or months to journey from the manufacturing facility to the customer. Under the IFALPA proposal, many lithium ion batteries in equipment will end up at a very low state of charge for an extended time, resulting in faster aging and degradation of the battery. In some instances, there may even be permanent battery failure resulting in product returns.

Further, there will be significant impacts to company's asset management, return, warranty and recycling operations. While some devices, such as phones and notebook computers that contain a lithium ion battery do have in-product ability to determine the charge of the battery, most devices do not. And no devices have the ability to easily discharge a battery. For a battery with a 10-hour charge, the only way to discharge the battery is to power the device for at least seven hours, and even then, there is rarely a way to ensure that the device is charged below 30%. In most cases, this will either place onerous requirements on the consumer before a device is returned to a manufacturer, or drive devices that would be sent back to the manufacturer for repair or refurbishment to be disposed of prematurely.

---

<sup>1</sup> Source: U.S. Bureau of the Census trade data and Campbell-Hill Aviation Group.

<sup>2</sup> Source: U.S. Bureau of the Census trade data and Campbell-Hill Aviation Group.

<sup>3</sup> See <https://www.wsj.com/articles/e-commerce-to-total-a-quarter-of-global-retail-by-2024-groupm-forecasts-11608116401>

Backup lithium ion batteries for servers are typically shipped and intended to keep a full charge unless the power to the server is interrupted, in which case the battery will allow for a smooth shut-down or keep the server running until backup power can be established. These batteries do not contain circuitry to determine state of charge, and are typically shipped fully charged, in a fire-resistant safety enclosure.

### **Industry Has a Strong Safety Record on Shipping Lithium ion Battery Powered Equipment**

Manufacturers of lithium ion battery powered equipment have a remarkable record for safely shipping their products by air not only into and from the United States, but also globally. The 2020 United States Bureau of the Census data show that the 713,000,000 pieces of equipment imported and exported from the United States represented a total of 2,569,400 shipments in 2020. Data compiled by the FAA show there were **two incidents involving air cargo in 2020 involving these import and export shipments of lithium ion battery powered equipment, plus domestic shipments by air that are not accounted for in the United States Bureau of the Census data.**<sup>4</sup> The incident data therefore does not support IFALPA's proposals to amend the ICAO TI.

### **Impacts on Shipments of Medical Devices**

Lithium ion batteries are widely used in life-saving medical devices, which are often shipped by air. The lithium ion batteries in these devices need to be shipped at 100 percent state of charge to allow for immediate use when the patient, doctor, or hospital receives it. Portable and/or implantable medical devices containing lithium batteries are not equipped with on/off switches due to well-documented and obvious patient safety concerns, since even minor agitation to the switch could inadvertently shut down the device, resulting in catastrophic failure or death. The off switch requirement is unsuitable and impractical for life-critical devices which are considered safe and essential enough to be accessible on flight decks.

If IFALPA's proposals are adopted, shipments of these life-saving medical devices will be severely impacted, with serious consequences to patient safety and health care costs. For example, wearable defibrillators that protect patients from sudden cardiac arrest are most often shipped by air because it is critical that patients are fitted as soon as possible. For every minute that a patient does not have access to a wearable defibrillator, risk of cardiac arrest increases.

Lastly, medical devices are required aboard passenger carrying aircraft to address circumstances where passengers or crew experience medical emergencies. Airlines not only carry the devices in the passenger cabin but must transport them as cargo to support operational requirements and avoid unnecessarily grounding the aircraft when replacement devices are needed. Requiring these medical devices to be shipped at the lowest state of charge would have serious implications to airlines being able to ship equipment including defibrillators and patient monitoring and communication devices.

---

<sup>4</sup> See [https://www.faa.gov/hazmat/resources/lithium\\_batteries/media/Battery\\_incident\\_chart.pdf](https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf)

## **Electric Vehicles Containing Lithium ion Batteries**

Placing a state of charge limit on lithium ion batteries installed in electric vehicles would create very significant technical and enforcement challenges. In electric vehicles, the actual lithium ion battery state of charge vs. what is displayed in vehicles are not the same. Vehicle displays are calibrated to useable battery capacity and range of the vehicle. But this “usable capacity” is different from “state of charge.” And other than the vehicle manufacturer, it is impossible for shippers of these vehicles to know the actual state of charge of the battery in the vehicle.

Moreover, there is no simple way to discharge a large electric vehicle battery other than to the drive the vehicle. And, if the vehicle arrives for shipment with a higher state of charge (assuming that could be determined, notwithstanding the prior paragraph), it could take hours of driving to reduce the state of charge to 30%. The only alternative – to manually discharge the battery in the vehicle – would require specialized procedures, equipment, and high voltage training and certification, and create potential employee injury risks.

## **United States and International Postal Service**

The United States Postal Service (USPS) and international postal shipping regulations authorize the transport by air of portable electronic equipment containing lithium ion batteries. Many small businesses and consumers ship via the USPS and international post packages of equipment like cellular phones, notebooks, and tablets containing lithium ion batteries. These packages are then offered to cargo and passenger aircraft for domestic and international air transport. IFALPA has failed to explain how these small businesses and consumers, with no experience on issues associated with the transport of lithium ion batteries, hazardous materials regulations, or state of charge would be expected to comply with a 30 percent state of charge or “lowest practical state of charge” requirement that would apply to such shipments.

## **IFALPA Proposal is Not Enforceable**

There is no discernible method to regulate lithium ion batteries based on “the lowest practical state of charge.” The term is not defined in any United States or international regulations or related battery testing standards (e.g., IEC62133, UN38.3). Most battery packs don’t have state of charge meters and ones that have LED light indicators will not have sufficient granularity for a determination of the lowest state of charge. Carriers will not be able to determine the state of charge and may request verification of how the lowest state of charge has been determined. The “lowest practical state of charge” also could change as a battery ages making it impossible to know what is the most “practical” under various transport scenarios. We therefore do not believe such a requirement should even be considered by the ICAO DGP.

\* \* \* \*

For all the reasons noted above, we respectfully request the U.S. DOT oppose IFALPA’s proposal at the upcoming ICAO DGP meeting. These are very complex issues that impact many industries, small businesses, and consumers. We therefore believe a more thoughtful and detailed technical and economic analysis of these impacts should be considered before ICAO takes any

action on these or similar proposals.

Thank you for considering our comments. Please contact George Kerchner with PRBA – The Rechargeable Battery Association at 202.719.4109 or [gkerchner@wiley.law](mailto:gkerchner@wiley.law) with any questions related to the issues addressed in our letter.

Signed,

Advanced Medical Technology Association  
Association of Home Appliance Manufacturers  
Cargo Airline Association  
Cellular Telecommunications Industry Association  
Computer and Communications Industry Association  
Consumer Technology Association  
Council on Safe Transport of Hazardous Materials  
Express Association of America  
Information Technology Industry Council  
Medical Device Manufacturing Association

Medical Device Transport Council  
Motor & Equipment Manufacturers Association  
Outdoor Power Equipment Institute  
National Electrical Manufacturers Association  
National Retail Federation  
NetChoice  
Power Tool Institute  
PRBA–The Rechargeable Battery Association  
Retail Industry Leaders Association  
TechNet

cc:

Tristen Brown, Acting Administrator, PHMSA  
Steve Dickson, Administrator, FAA  
William Schoonover, Associate Administrator, PHMSA  
Duane Pfund, International Coordinator, PHMSA  
Ben Supko, Director, Office of Hazardous Materials Safety, FAA  
Sophie Shulman, Deputy Chief for Policy, DOT  
Moshin Syed, Governmental Affairs, DOT