

New PHMSA Lithium Ion Battery Rule Seeks Harmony in the Safe Skies

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I. INTRODUCTION Safety hazards presented by the air transportation of lithium ion batteries are once again the subject of regulatory action in the United States. The U.S. DOT's Pipeline and Hazardous Materials Safety Administration (PHMSA) recently issued an Interim Final Rule (IFR) seeking to revise the Hazardous Materials Regulations for lithium cells and batteries transported by aircraft. The IFR sets forth three distinct provisions. Specifically, it would: (1) prohibit the transportation of lithium ion cells and batteries as cargo on passenger aircraft; (2) require lithium ion cells and batteries to be tendered at not more than a 30 percent charge not shipped with or contained in equipment; and (3) limit the use of alternative measures for small lithium cell or battery shipments to only one package per consignment.

Domestically within the United States, there have been over 200 reported incidents involving lithium batteries and air transport.^[1] The majority of these incidents have occurred in the past three years. The historic trend line is a stark reality to those tasked with transportation safety and supply chain security, and certainly for airline passengers. As more consumer products use lithium batteries, and as manufacturers continue to push the envelope of battery performance, the rate of incidents and frequency of alarming headlines can be reasonably expected to rise.^[2]

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In fairness, the danger of fire and explosion associated with air transportation of lithium ion batteries has been known to the air transportation community for decades.^[4] However, the present regulatory environment continues to be unique in its speed of change. This article examines the current regulatory regime as an emerging trend in hazardous materials compliance for the air transport of lithium batteries.

II. SUMMARY OF REGULATIONS GOVERNING AIR CARRIAGE OF LITHIUM BATTERIES

The PHMSA is tasked with regulating the transportation of hazardous materials. The term "hazardous materials" is defined broadly as any "substance or material that the Secretary of Transportation has determined is capable of posing an unreasonable risk to health, safety and property when transported in commerce...."^[5] Lithium batteries are regulated hazardous materials due to the risk of the batteries overheating and causing a fire.^[6]

Lithium batteries are specifically regulated as Class 9 hazardous materials under the Hazardous Materials Regulations (HMR).^[7] The hazardous materials classification applies to the lithium ion batteries and cells that power consumer electrical devices as well as disposable lithium metal

batteries. Under the HMR, lithium batteries are subject to complex inspection, testing, packaging, labeling, recordkeeping and notification requirements.^[8] The practical application of these rules differs depending on the quantity of lithium and whether the batteries are contained in equipment carried aboard by passengers and crew or tendered as air cargo.

Air transportation of lithium batteries is a serious matter for all parties involved. The FAA, as a sister DOT division with PHMSA, holds authority to designate, and regulate the transportation of, hazardous materials to promote safe flight of civil aircraft.^[9] Despite the risk of fire and explosion, there are limited exceptions. Lithium batteries may be carried by air crew/passengers for personal use subject to the following conditions:

- Lithium batteries installed in portable electronic devices may be in carry-on or checked baggage.
- Spare lithium batteries may be in carry-on baggage only (not checked or gate-checked baggage), provided that the spare batteries are protected from damage or short circuit by being placed in secure packaging with the terminals protected from contacting other metal.
- Whether installed in portable electronic devices or carried as a spare: (1) lithium metal batteries may not have a lithium content of more than 2 grams per battery; and (2) lithium ion batteries may not have a Watt-hour rating exceeding 100 Wh (lithium ion batteries with Watt-hour rating between 101-160 Wh may be carried subject to limited exceptions with air operator approval).^[10]

However, the ability to carry lithium batteries and lithium powered devices on aircraft is not unlimited and is subject to reasonable restrictions for potentially unsafe devices. Under the HMR, carriage of batteries or battery-powered devices is not permitted if the batteries or devices “are likely to create sparks or generate a dangerous evolution of heat, unless packaged in a manner which precludes such an occurrence.”^[11] Further, lithium cells or batteries that have been “identified by the manufacturer as being defective for safety reasons [and] have the potential of producing a dangerous evolution of heat [or] fire,” are prohibited from air transportation.^[12]

The broader regime governing transportation of lithium batteries as air cargo is significantly more complex than the typical airline passenger experiences. The general approach manages risk by prescribing net quantity per package guidelines based upon the lithium content of each cell or battery.^[13] Lithium batteries packed with or contained in equipment are limited to the number required to power the equipment plus two spares, provided that the total net mass of the lithium cells or batteries in the package transported does not exceed 5 kg.^[14] When packages of lithium metal cells or batteries exceed 5 kg, the packaging may not be transported by air carrier and must be marked with one of the following warnings: “PRIMARY LITHIUM BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT” or “LITHIUM METAL BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT,” or labeled “CARGO AIRCRAFT ONLY.”^[15]

III. PHMSA INTERIM FINAL RULE AND A LOOK TO HARMONIZATION

The regulatory regime is quickly evolving as one would expect based upon headlines and reported incidents. Agencies and trade associations across the globe are trending toward harmonized international rules and best practices for shipments containing lithium batteries. In 2016, the U.N.’s

International Civil Aviation Authority put restrictions similar to the IFR in place for all member countries in an effort to prevent the risk of in-flight cargo hold fires.^[16] The air transportation industry in the United States is no exception in its alignment with international trends. Two central themes have emerged. First, the carriage of lithium batteries as cargo on passenger aircraft is quickly falling into disfavor. Those batteries that are carried will face strict quantity, packaging and charge restrictions. Second, all parties involved in the air transportation of lithium ion batteries are increasingly encouraged to adopt compliance measures tailored to their particular roles in the supply chain. Manufacturers and shippers who seek to avoid compliance with international norms will face increasing scrutiny—even in the form of self-policing among legitimate industry.

In an effort to harmonize U.S. regulation with the International Civil Aviation Organization's (ICAO's) Technical Instructions for the Safe Transport of Dangerous Goods by Air, PHMSA has issued the IFR to address the "serious public safety hazards associated with lithium battery transportation."^[17] ICAO amended its Technical Instructions for the Safe Transportation of Dangerous Goods by Air to include: (1) the prohibition of transporting lithium batteries aboard passenger aircraft unless contained in carry-on personal electronic devices; (2) a requirement that all lithium batteries transported aboard cargo aircraft carry a charge no greater than 30% of their rated capacity; and (3) a limitation of one package of lithium batteries per overpack.^[18] Due to the safety concerns and the statutory deadline found within the FAA Reauthorization Act of 2018, the IFR will go into effect without advance notice and opportunity for public comment.

The IFR, if finalized, will thus amend the HMR to mirror the amendments to the ICAO Technical Instructions. The key HMR amendments will: (1) prohibit the transport of lithium ion cells and batteries as cargo on passenger aircraft; (2) require all lithium ion cells and batteries to be shipped at not more than a 30 percent state of charge on cargo-only aircraft; and (3) limit the use of alternative provisions for small lithium cell or battery to one package per consignment. Despite these restrictions, it is important to bear in mind that these rules will not restrict passengers or crew members from bringing personal items or electronic devices containing lithium-ion cells or batteries, even if charged above 30 percent, since they will be packed with or contained in equipment. Additionally, the IFR provides a limited exception for medical devices to accommodate persons in areas potentially not serviced daily by cargo aircraft.

These rules may seem burdensome to some, but adoption is likely whether or not it is required. According to PHMSA, several large U.S. carriers have already voluntarily complied with the ICAO amendments, thus reducing any additional regulatory hurdle they would have to satisfy.^[19]

IV. LITHIUM BATTERIES AND HAZARDOUS MATERIALS COMPLIANCE

The far-reaching impact of coming changes will influence consumers, manufacturers, forwarders and carriers who employ aircraft to transport this increasingly prominent means of powering modern life. However, regulatory changes alone are insufficient to ensure air safety. The PHMSA and Federal Aviation Administration (FAA) advisories correctly suggest that operational best practices are essential to keeping individuals safe and companies out of headlines. Compliance with this changing world of lithium transportation requires vigilant awareness, assessment, training and process improvement.

All transportation participants must recognize that lithium compliance is not new, although certain aspects are changing in real time. Ultimately, lithium is just one hazardous material among all those

regulated as part of the HMR. The FAA correctly does not prescribe specific guidelines, instead it emphasizes best practices of conducting broad assessments of shippers, cargo requirements, communications, and safety and operating procedures in developing effective responses to each participant's risk profile. There is no one-size-fits-all solution to hazardous materials compliance, in part because of the innumerable (and often invisible) ways in which lithium batteries are infiltrating our everyday lives. Every shipper, forwarder or carrier must closely analyze operations and develop appropriate standard operating procedures to manage risk. It would be appropriate for corporate compliance professionals to review these standard operating procedures at least once annually due to the increasing speed of change.

Compliance with all HMR is the responsibility of every shipper, forwarder and carrier. Each is subject to investigations and inspections that carry civil and criminal penalties for violations of the HMR. Civil penalties increased in 2016 to \$77,114 per violation, or \$179,933 per violation in cases involving death or serious bodily injury.^[20] The civil penalty for training violations is now \$463.^[21] Criminal penalties may include imprisonment for up to 5 years, or 10 years in cases involving death or bodily injury.^[22] Of course, the potential for loss of life and damage to reputation are immeasurable.

REMEMBER: SAFETY INCIDENTS INVOLVING THE AIR TRANSPORTATION OF LITHIUM BATTERIES MUST BE REPORTED TO THE NATIONAL RESPONSE CENTER (1-800-424-8802) AS SOON AS PRACTICAL BUT NO LATER THAN 12 HOURS AFTER THE OCCURRENCE.^[23] A WRITTEN INCIDENT REPORT IS ALSO REQUIRED.^[24]

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^[1] See FAA Lithium Batteries & Lithium Battery-Powered Devices Report, FAA (Feb. 1, 2019).

^[2] *Id.*

^[3] Chart compiled from data available at *id.*

^[4] See, e.g., FAA SAFO 10017 (Oct. 8, 2010); see also "The FAA Is Freaked Out About Lithium-Ion Batteries on Planes," Popular Mechanics (Oct. 19, 2015); "New FAA rules limit batteries in checked and carry-on baggage," ARS Technica (Dec. 31, 2007).

^[5] 49 C.F.R. § 171.8.

^[6] See, e.g., 49 C.F.R. § 173.185; FAA SAFO 15010 (Oct. 8, 2015); FAA SAFO 10017 (Oct. 8, 2010).

^[7] 49 C.F.R. Parts 100 to 185.

^[8] See 49 C.F.R. §§ 175.30, 175.33, 175.75, and 173.185.

^[9] 49 U.S.C. §§ 5101, *et seq.*; 49 U.S.C. § 44701.

[10] 49 C.F.R. § 175.10(a)(18).

[11] 49 C.F.R. § 173.21(c).

[12] See 49 C.F.R. § 173.185(f).

[13] 49 C.F.R. § 173.185(c)(4).

[14] *Id.*

[15] 49 C.F.R. § 173.185(c)(1)(iii). Additional packing, marking, and air waybill completion requirements are also provided in 49 C.F.R. § 173.185(c)(4).

[16] See *Lithium-ion batteries banned as cargo on passenger planes*, CNN Business, <https://money.cnn.com/2016/02/23/news/companies/lithium-ion-battery-ban-airplanes/index.html>.

[17] IFR at Page 5.

[18] ICAO Addendum No. 3 (January 15, 2016); ICAO Addendum No. 4 (February 23, 2016).

[19] See *U.S. bars lithium batteries as cargo on passenger aircraft*, Reuters, <https://www.reuters.com/article/us-usa-airlines-safety/u-s-bars-lithium-batteries-as-cargo-on-passenger-aircraft>.

[20] 49 C.F.R. § 107.329.

[21] *Id.*

[22] 49 C.F.R. § 107.333.

[23] 49 C.F.R. § 171.15

[24] 49 C.F.R. § 171.16.