CLIENT ALERTS & INSIGHTS

Hot Pocket: Samsung Galaxy Note 7 Recall Highlights Risk of Lithium Batteries During Air Transportation

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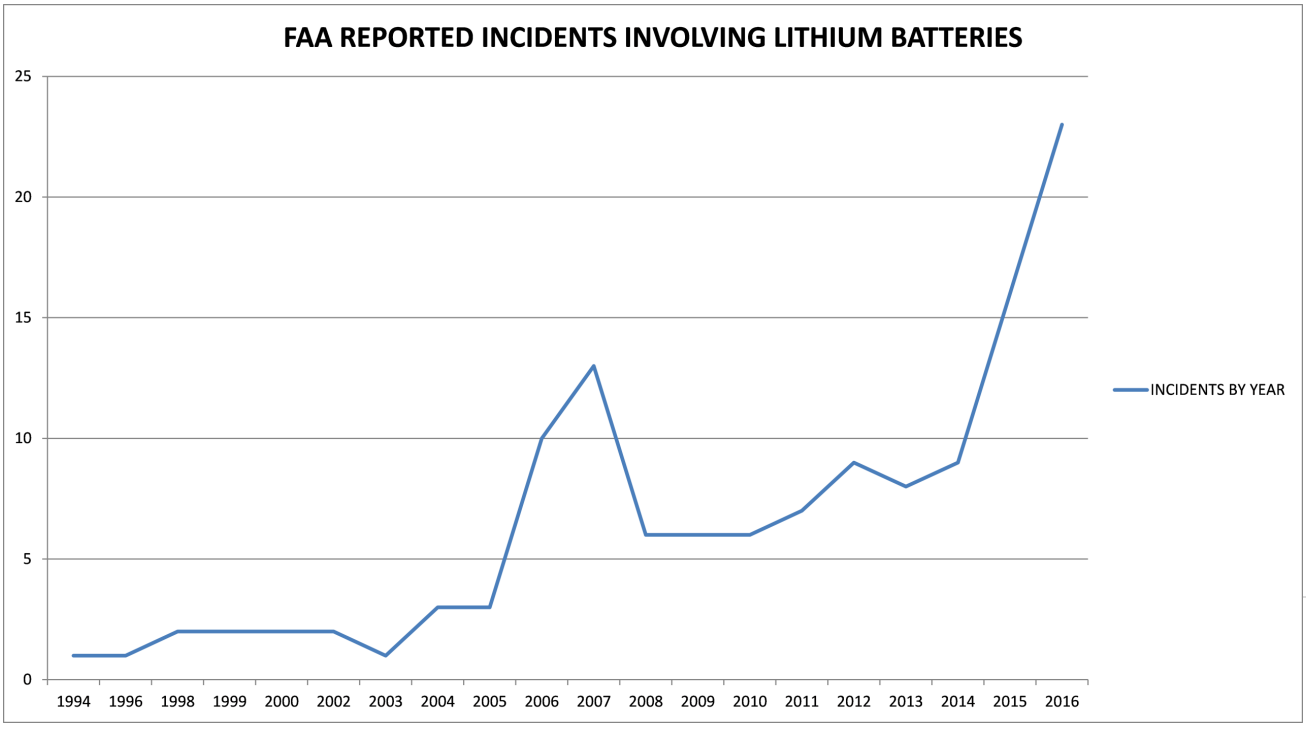
I. INTRODUCTION

Air transportation of lithium ion batteries recently garnered significant attention due to events following reports of the Samsung Galaxy Note 7's batteries overheating, catching fire, and even exploding. *See* Samsung Recalls Galaxy Note7 Smartphones Due to Serious Fire and Burn Hazards, Consumer Product Safety Commission, (Sept. 15, 2016). Samsung responded by recalling the Galaxy Note 7 and ceasing production, which subsequently led the Federal Aviation Administration ("FAA") to issue a Safety Alert For Operators ("SAFO") prohibiting air transportation of recalled lithium batteries and lithium battery powered and limiting its carriage by air crew and passengers. See FAA SAFO 16011 (Sept. 16, 2016). On October 15, 2016, the U.S. Department of Transportation ("DOT"), with the FAA and the Pipeline and Hazardous Materials Safety Administration ("PHMSA"), announced a complete ban on the Galaxy Note 7 for both on-person carriage and as air cargo. Samsung's recall and the FAA's corresponding SAFO, culminating with a complete ban on the device, highlight the increasing hazards posed by transportation of lithium batteries as air cargo.

Serious lithium battery incidents, including those causing catastrophic failure during flight, are not a new concern. Domestically, there have been a total of 129 reported incidents involving lithium batteries. *See* FAA Lithium Batteries & Lithium Battery-Powered Devices Report, FAA (Sept. 15, 2016). However, the trendline is a stark reality to those in government and industry tasked with the safety and security of air freight. As more consumer products use lithium batteries, and as manufacturers continue to push the envelope of these batteries' capabilities, the rate of incidents and frequency of alarming headlines can be reasonably expected to rise. *See id.*



(Chart compiled from data available at *id.*)

The danger of fire and explosion associated with air transportation of lithium ion batteries has been known to the air transportation community for decades. *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). However, the present regulatory environment is unique in its collective vision, collaboration, and speed of change. This article examines the current regulatory regime, the forces shaping is future, and the emerging trends in hazardous materials compliance as it relates to the air transport of lithium batteries.

II. SUMMARY OF REGULATIONS GOVERNING AIR CARRIAGE OF LITHIUM BATTERIES

The PHMSA is the division of the DOT 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…." 49 C.F.R. § 171.8. Lithium batteries are regulated hazardous materials due to the risk of the batteries overheating and causing a fire. *See, e.g.* , 49 C.F.R. § 173.185; FAA SAFO 15010 (Oct. 8, 2015); FAA SAFO 10017 (Oct. 8, 2010).

Lithium batteries are specifically regulated as Class 9 hazardous materials under the Hazardous Materials Regulations ("HMR"). 49 C.F.R Parts 100 to 185. 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. *See* 49 C.F.R. §§ 175.30, 175.33, 175.75, and 173.185. The practical application of these rules differ depending on whether the batteries are contained in equipment carried aboard by passengers and crew, such as the Galaxy Note 7, or instead tendered as air cargo. One of the key differences under the HMR is the quantity of lithium and its containment in equipment.

Air transportation of lithium batteries is a serious matter for all parties involved. The FAA, as a sister DOT division with PHMSA, does indeed hold authority to designate, and regulate the transportation of, hazardous materials to promote safe flight of civil aircraft. 49 U.S.C. §§ 5101, *et seq.*; 49 U.S.C. § 44701. 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).

49 C.F.R. § 175.10(a)(18).

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." 49 C.F.R. § 173.21(c). 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," such as the Galaxy Note 7, are prohibited from air transportation. *See* 49 C.F.R. § 173.185(f).

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. 49 C.F.R. § 173.185(c)(4). 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. *Id.* When packages of lithium metal cells or batteries exceed 5kg, 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." 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).

III. A VIEW TO THE FUTURE OF REGULATING LITHIUM BATTERY AIR TRANSPORTATION

As one would expect based upon headlines and reported incidents, the regulatory regime is quickly evolving. Agencies and trade associations across the globe are trending toward harmonized international rules and best practices for shipments containing lithium batteries. The air transportation industry in the United States is no exception in its alignment with international trends. Two central themes are emerging. 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.

The most recent significant change came when PHMSA issued a Notice of Proposed Rulemaking titled Hazardous Materials: Harmonization With International Standards. 81 FR 61741 (September 7, 2016). Chief among the material proposed amendments is to prohibit transporting lithium cells and batteries as cargo on passenger aircraft. When transporting on cargo aircraft, lithium cells and batteries must hold a charge not greater than 30 percent. PHMSA also proposes limiting or eliminating certain exceptions for small shipments. Finally, PHMSA seeks to update the hazard communication requirements, such as the adoption of a standard lithium battery mark for use across all modes and requiring that hazard markings are applied to each package or container of more than four cells or batteries in equipment or where there are more than two packages in any consignment.

The substance of many of these proposed amendments were also found in a PHMSA Safety Advisory Notice issued to increase awareness among domestic shippers, carriers, and forwarders of

actions taken by the International Civil Aviation Organization ("ICAO"). PHMSA Notice No. 2016-5 (April 1, 2016). In an ominous warning, PHMSA drew attention to the determination among aircraft manufacturers and regulatory agencies that aircraft fire suppression technologies are not capable of containing the flames and heat generated by packages of lithium batteries. 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. ICAO Addendum No. 3 (January 15, 2016); ICAO Addendum No. 4 (February 23, 2016).

In similar ominous tone, the FAA also issued another SAFO warning of "the potential for catastrophic hull loss" resulting from the fire and explosion risk associated with transporting lithium batteries. SAFO 16001 (January 19, 2016). The FAA supports recommendations by ICAO and aircraft manufacturers that operators conduct safety risk assessments in order to manage the risks associated with lithium batteries. ICAO identified seven criteria for such a safety risk assessment: (1) capabilities of the operator; (2) overall capability of the aircraft and its systems; (3) packing and packaging; (4) quantity of batteries and cells; (5) containment characteristics of unit load devices; (6) specific hazards and safety risks associated with each battery and cell type to be carried alone or in combination; and (7) chemical composition of the batteries and cells. ICOA Supplement Addendum (February 23, 2016).

IV. LITHIUM BATTERIES AND HAZARDOUS MATERIALS COMPLIANCE

The far-reaching impact of coming changes will influence not only the way consumers handle cellular phones when boarding aircraft, but the wider range of 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 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, as well as 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 are 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. 49 C.F.R. § 107.329. The civil penalty for training violations is now $463. *Id.* Criminal penalties may include imprisonment for up to 5 years, or 10 years in cases involving death or bodily injury. 49 C.F.R. § 107.333. Of course, the potential for loss of life and damage to reputation are immeasureable.

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. (49 C.F.R. § 171.15) A WRITTEN INCIDENT REPORT IS ALSO REQUIRED. 49 C.F.R. § 171.16.

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