U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

February 26, 2020

The Honorable Roger Wicker
Chairman, Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Mr. Chairman:

This letter transmits the Federal Aviation Administration's (FAA) report to Congress on the progress in meeting the requirements of Section 333(e) of the FAA Reauthorization Act of 2018 (Public Law 115-254).

Section 333(e)(3) of the FAA Reauthorization Act of 2018 requires providing an initial report and two subsequent annual updates to Congress describing efforts to improve interagency and international cooperation to ensure compliance with safety regulations for air transport of lithium batteries.

We look forward to continued collaboration with your staff, and would be happy to schedule time to brief you further.

We have sent identical letters to Chairman DeFazio, Senator Cantwell, and Congressman Graves.

Sincerely,

Steve Dickson
Administrator

Enclosure

U.S. Department
of Transportation

**Federal Aviation
Administration**

Office of the Administrator

800 Independence Ave., S.W.
Washington, D.C. 20591

February 26, 2020

The Honorable Peter A. DeFazio
Chairman, Committee on Transportation
and Infrastructure
House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

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February 26, 2020

The Honorable Sam Graves
Committee on Transportation
and Infrastructure
House of Representatives
Washington, DC 20515

Dear Congressman Graves:

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February 26, 2020

The Honorable Maria Cantwell
Committee on Commerce, Science,
and Transportation
United States Senate
Washington, DC 20510

Dear Senator Cantwell:

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Steve Dickson
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Federal Aviation Administration

Initial Report to Congress on Cooperative Efforts to Ensure Compliance with Aviation Safety Regulations for Lithium Batteries

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Background

Modern economies require fast and efficient transportation of lithium batteries that can only be provided by air cargo. More than 53.7 million lithium batteries, comprising 50,208 shipments, were projected to have been transported by air in calendar year (CY) 2018.[1] These numbers reflect the value inherent in the shipping and carrying of lithium batteries and their associated electronics. For example, according to U.S. Census Bureau Trade Data, 73 percent of electronics powered by lithium batteries imported to the United States are transported by air—and these electronics were worth more than $120 billion for CY 2018 alone.

In aviation, the concerns with lithium batteries in cargo cannot be managed flight by flight, battery by battery, package by package, or manufacturer by manufacturer. The aviation and lithium battery industries are too extensive to manage risk this way. In order for air carriers to have confidence in the transport of lithium batteries in cargo by air, the level of risk needs to be controlled with accountability and transparency. Furthermore, efforts have to be implemented and accepted on both a national and worldwide level. Improving the safety of lithium battery transportation is in the global interest, and a global solution is necessary.

Lithium batteries have the potential to contribute to fires and potentially affect the airworthiness of an aircraft. The Federal Aviation Administration (FAA) is aware of 49 air incidents in CY 2018 involving lithium batteries carried as cargo or baggage resulting in smoke, fire, extreme heat, or explosion.[2] In addition to the safety risks, these incidents disrupt commerce. For example, passenger incidents with lithium batteries and electronics can result in emergency landings or a return to gate. In 2018, four passenger air incidents involving lithium batteries resulted in disruptions requiring an emergency landing or return to gate. An emergency landing of a domestic flight may cost an airline about $30,000, while international diversion costs can be approximately $70,000 to $230,000.[3] As global trade increases, manufacturers will ship more and more electronics and lithium batteries, leading to further risk to the system.

An approach that works at every level of transportation is key to addressing the risk to aviation. Every product that touches an aircraft represents the cumulative effort of multiple organizations in the supply chain (e.g., supplier, manufacturer, distributor, retailer, and consumer). In this process, any single action can impact aviation safety. For example, if the highway community has a greater awareness of shipping requirements for lithium batteries, fewer noncompliant shipments would enter the other modes. Everyone in the supply chain is responsible for aviation safety, and must do all that they can do to prevent risks that could exceed the capability of the aircraft to handle them.

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[1] https://www.regulations.gov/document?D=PHMSA-2016-0014-0009

[2] https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf;

[3] https://www.iata.org/whatwedo/workgroups/Documents/ACC-2014-GVA/occ-5-diversion.pdf; https://www.theatlantic.com/health/archive/2013/04/medical-emergencies-at-40-000-feet/274623/; https://www.bloomberg.com/news/articles/2018-05-29/airlines-count-costs-of-unplanned-landings-when-flyers-fall-ill

FAA Reauthorization Act of 2018

Section 333 of the FAA Reauthorization Act of 2018 (Public Law No. 115-254) directs the Secretary of Transportation to carry out a wide range of activities related to lithium batteries, from revising regulations to harmonize with international standards, to evaluating packaging standards, to providing fora to enhance stakeholder input.

Section 333(e)(1) directs the Secretary to improve interagency and international cooperative efforts to ensure compliance with safety regulations for air transport of lithium batteries. More specifically, Section 333(e)(2) directs the Secretary to conduct the following activities:

- Encouraging training programs at locations outside the United States from which substantial cargo shipments of lithium ion or lithium metal batteries originate. See Sec. 333(e)(2)(A).
- Working with Federal, regional, and international transportation agencies to ensure enforcement of safety regulations with respect to shippers who offer noncompliant shipments of lithium ion and lithium metal batteries. See Sec. 333(e)(2)(B).
- Sharing information, as appropriate, with Federal, regional, and international transportation agencies regarding noncompliant shipments. See Sec. 333(e)(2)(C).
- Pursuing a joint effort with the international aviation community to develop a process to obtain assurances that appropriate enforcement actions are taken to reduce the likelihood of noncompliant shipments. See Sec. 333(e)(2)(D).
- Providing information in brochures and on the internet in appropriate foreign languages and dialects that describes the actions required to comply with safety regulations. See Sec. 333(e)(2)(E).
- Developing joint efforts with the international aviation community to promote a better understanding of the requirements of, and methods of compliance with, safety regulations. See Sec. 333(e)(2)(F).

Section 333(e)(3) sets out the requirement for this report: "Not later than 120 days after the date of enactment of this Act, and annually thereafter for 2 years, the Secretary shall submit to the appropriate committees of Congress a report on compliance with the policy set forth in subsection (e) and the cooperative efforts carried out, or planned to be carried out, under this subsection."

This report provides the initial update, required by Section 333(e)(3), related to stakeholder engagement and enforcement activities being taken to reduce noncompliance with battery transport requirements. The following information will identify the domestic and international efforts currently underway by the Department of Transportation (the Department).

DOT's Approach to Lithium Battery Safety

The safe transportation of lithium batteries by air is a priority for the Department. Both the Pipeline and Hazardous Materials Safety Administration (PHMSA) and FAA have taken a

comprehensive approach to enhance safety in air transport of lithium batteries. PHMSA and FAA have also worked with international organizations to enhance safety.

This comprehensive approach includes supporting lithium battery harmonization between domestic and international regulations; promoting battery safety with shippers of batteries and battery powered devices; communicating information with our international partners on the hazards associated with the transportation of batteries; and working with and encouraging the battery industry to assist in promoting battery safety. PHMSA and FAA have employed many tools, such as education, outreach, collaboration, and, when required, various enforcement techniques to focus on this significant transportation sector issue.

PHMSA's Role in Lithium Battery Safety

PHMSA's role as the authority for the Hazardous Materials Transportation Law (49 U.S.C. 5101 et seq.) and the Hazardous Materials Regulations (49 CFR parts 171-180) provide the core requirements to classify, package, and communicate the transportation hazards of lithium batteries. This safety foundation serves as the basis for many of the decisions made throughout the supply chain. Non-compliance with PHMSA's classification, packaging, or communication requirements impacts safe transport in all modes, but has a potentially larger impact on aviation safety due to the increased possibility of high-consequence events. PHMSA regulations apply to persons and organizations that perform pre-transportation functions (i.e., product manufacturer, package manufacturer, shipper/offerors, freight forwarder, etc.) who are critical to compliance and risk management. PHMSA also regulates multi-modal transportation of hazardous materials (known as "dangerous goods" globally) in commerce.

In addition, PHMSA leads multiple interagency and global fora to discuss all hazardous material risks, including lithium batteries, as well as international harmonization issues. PHMSA is leading many of the efforts required by Section 333 of the FAA Reauthorization Act of 2018. For example, PHMSA has established a federal advisory committee to facilitate communication between lithium battery and cell manufacturers, shippers, end users, transporters, and the Federal Government, to provide a forum for the Secretary to discuss the activities of the Department, and seek stakeholder input relating to lithium battery transportation safety, including input that helps the government develop positions to advocate in international fora. The first meeting was held January 22-23, 2020.

FAA's Role in Lithium Battery Safety

The aviation landscape has changed dramatically over the past decade, and several factors in particular are increasing the complexity of the industry and introducing different sources of safety risk into the aerospace system. These factors include concerns with lithium batteries and other emerging technologies that are being transported more and more as aircraft cargo and/or passenger carry-on luggage. The FAA takes any risks to aviation safety very seriously, and lithium battery safety remains one of the highest priorities for FAA. To fulfill FAA's role in promoting safety, the FAA monitors and manages safety risk in the aerospace system through Safety Policy, Safety Risk Management (SRM), Safety Assurance, and Safety Promotion. The

FAA initiates education and outreach campaigns, responds to lithium battery noncompliance, and collaborates with air carriers to ensure compliance.

In meeting its oversight responsibilities, the FAA utilizes risk-based surveillance to study system data, look for emerging trends, identify the emerging safety risk, and mitigate the risk before incidents or accidents occur. The FAA's role in managing risks to the aviation system also includes developing processes and implementing the use of newly developed equipment and information to determine how to mitigate both current and future risks. If air carriers have the ability to implement solutions reducing the likelihood of a catastrophic outcome, the overall level of safety and confidence in the aviation system will increase. The goal is for air commerce not only to be equipped for the continued advancement and evolution of lithium batteries, but also to be prepared for future emerging technology and energy sources.

DOT's Role in International Transportation of Lithium Batteries

Safety transcends borders; this concept applies at all levels—from the collaboration among organizations within the Department, to interactions with industry and the international community. To promote safety regulations and foster an integrated approach to oversight, PHMSA and FAA participate in the International Civil Aviation Organization (ICAO) Dangerous Goods Panel (DGP), and conduct outreach with internal and external stakeholders. Member States[4] collaborate through the ICAO DGP to develop overarching regulations, standards, and best practices that help to ensure the safe, secure, and efficient transportation of dangerous goods, internationally and domestically. This collaboration promotes better understanding of the requirements and methods of compliance among the international aviation community.

PHMSA and FAA are involved in a number of international cooperative efforts that are focused on managing the possible safety risks posed by the carriage of lithium batteries by air. For example, the ICAO DGP will consider how to use the lithium battery package standard, under development by the SAE (formerly known as Society of Automotive Engineers) Lithium Battery Performance Packaging (G-27) Committee (AS6413), for risk mitigation. The SAE G-27 Lithium Battery Performance Packaging Committee is a technical committee in SAE's General Projects Systems Group with the responsibility for the development and maintenance of minimum performance package standards that support the safe shipment of lithium batteries as cargo on aircraft. PHMSA and FAA are providing technical expertise to this effort.

There is also an international effort to review the classification system of lithium batteries, developed through coordination with the United Nations (UN) Economic and Social Council's (ECOSOC) Sub-Committee of Experts on the Transport of Dangerous Goods (SCOE TDG) under PHMSA's leadership. The SCOE TDG develop and update the UN Model Regulations on the Transport of Dangerous Goods. The UN Model Regulations present a basic scheme of provisions that allow uniform development of national and international regulations governing various modes of transport, leading to increased harmonization of global dangerous goods transportation requirements. This lithium battery classification initiative would classify lithium batteries relative to the risk they pose in transportation, rather than a one-size-fits-all approach.

[4] A list of ICAO Member States can be found at https://www.icao.int/about-icao/Pages/member-states.aspx.

Improving the risk-based approach for manufacturers also provides the air carriers with increased reliability in determining what measures and equipment are needed to maintain safe flight. Improving classification of lithium batteries can help control risks at the aircraft level.

Stakeholders' Role in Lithium Battery Safety

The safe transportation of lithium batteries by air is a priority for stakeholders as well. More and more, stakeholders take a systems safety approach to enhance safety in air transport of lithium batteries, often working together to address risks before the batteries enter air transport.

Stakeholders include the international community, lithium battery manufacturers, device manufacturers, the aviation community, and everyone in the supply chain. Many stakeholders understand the risks that lithium batteries pose for civil aviation. Some stakeholders have even initiated voluntary efforts to address existing safety concerns, and evaluate future technologies for safe use and transport in aviation. For example, Operation Safe2Fly is an initiative from UL (formerly known as Underwriters Laboratories) and the Independent Pilots Association to develop a voluntary industry auditing program for lithium battery safety.[5] On November 13-14, 2019, FAA participated as a panelist in two sessions at the UL Aviation Safety Summit held in Singapore that focused on the intersection of aviation safety and battery science. Stakeholders are engaging in dialogues to foster collaboration and cooperation to address battery risks before they enter the supply chain. Stakeholders are taking action to promote safer methods of testing, packaging, and manufacturing quality control for lithium batteries.

Voluntary efforts by stakeholders are a critical step in advancing battery transportation safety globally. The Department is encouraged by these voluntary efforts and supports working collaboratively with stakeholders on this shared aviation safety goal.

Education Campaigns and Stakeholder Engagement Activities

The Department works towards continuously improving an organizational culture that fosters the development and implementation of effective and efficient safety measures and processes. This includes the engagement of stakeholders to raise awareness of safety concerns. PHMSA and FAA have implemented, and are continuously expanding, a significant stakeholder engagement preventive program, in collaboration with all entities in the supply chain, to include manufacturers, shippers, air and ground carriers, industry organizations, government representatives, and the public. All of the campaigns are contributing to promoting safety in the transportation system. Different audiences require different messages, media, and fora.

PHMSA is engaged in several activities and initiatives for lithium battery safety, focusing on a multi-modal approach, including highway, rail, air, and vessel transportation. FAA is engaged in similar activities and initiatives that focus specifically on the air transport mode. These targeted stakeholder engagement awareness activities provide messaging appropriate to the audience to address risk at the source, and optimize value and efficiency. Knowing the specific audience is key to the success of these efforts.

[5] http://www.ipapilot.org/batteries/OperationSafe2FlyHandout.pdf

Both PHMSA and FAA make lithium battery safety information materials available to the industry, and communicate safety information through various methods and media, including: State and industry conferences/seminars; Congressional briefings and fact sheets; presentations, workshops and panel discussions; video messages; content on public websites; social media; print materials (posters, flyers, brochures); and publications for external audiences. The following sections of this report provide examples of these activities.

The activities covered by the education campaigns and stakeholder engagement activities section of this report address paragraphs (e)(2)(A), (E), and (F) of Section 333 of the FAA Reauthorization Act of 2018.

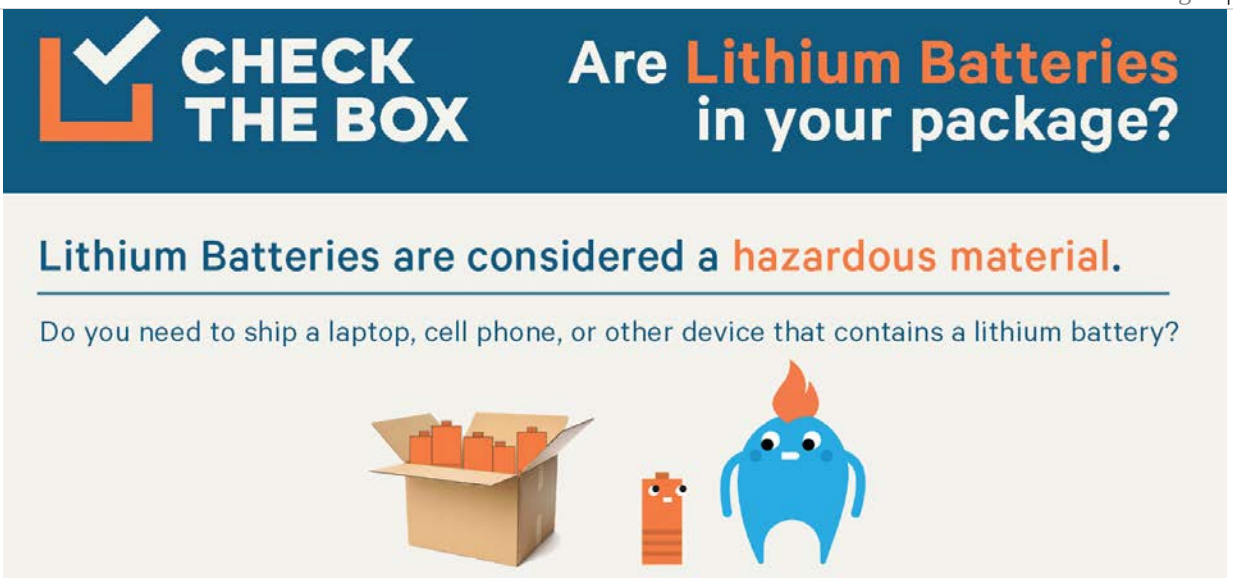
PHMSA Outreach and Engagement Initiatives

PHMSA is engaged in several activities and initiatives for lithium battery safety, focusing on a multi-modal approach, including highway, rail, air, and vessel transportation. The "Check the Box" campaign is an example of PHMSA's multimodal campaign. "Check the Box" is a public awareness campaign that seeks to prevent serious incidents by increasing the public's awareness of everyday items that are considered hazardous materials (hazmat), including lithium batteries. The Department launched the "Check the Box" campaign in August 2018 at the Air Line Pilots Association, International (ALPA) Air Safety Forum. The first goal of the campaign is to raise public awareness of the risks of hazmat in transportation. The second goal of the campaign is to connect the public to resources that describe the actions required to comply with hazardous materials regulations. PHMSA leads this Department-wide and multi-modal initiative, with support from the FAA, Federal Motor Carrier Safety Administration (FMCSA), Federal Railroad Administration (FRA), and United States Coast Guard (USCG). Stakeholders, such as ALPA, the Association of Mail and Business Centers (AMBC), and the United States Postal Service (USPS), have expressed support for this campaign.[6] PHMSA has also promoted the "Check the Box" campaign internationally, through ICAO.

In support of the campaign goals, the Department hosts a dedicated "Check the Box" website[7] to serve as the central source of campaign messaging and resources. PHMSA has also developed a social media presence around the campaign via the Twitter platform to direct the public to the website. The website hosts resources such as brochures, fact sheets, and videos that increase awareness of the risks of hazardous materials and promote a better understanding of hazardous materials regulations. PHMSA has also promoted the campaign through informational webinars, as well as a physical presence at industry events such as conferences, fora, and trainings.

The campaign is also supported by a video series, the first of which introduces potential shippers to the concept of dangerous goods hiding in everyday, household items, with a call to action to visit the campaign website for more information on regulatory compliance. The "Check the Box" campaign provides a unique platform to direct potential shippers to specific engagement materials, tailored for various modes of transport, and developed by modal partners of the campaign, such as FAA's "SafeCargo" for air shipments.

[6] http://www.alpa.org/news-and-events/air-line-pilot-magazine/the-landing-check-the-box
[7] https://checkthebox.dot.gov/



This campaign provides PHMSA with a unique opportunity to develop targeted messaging around holidays and other special events that could increase the likelihood of undeclared hazmat shipments. An example of this is the holiday-themed campaign video released via the Twitter platform and the Check the Box campaign's website. PHMSA has also used the campaign to reach stakeholders that are not traditional hazmat shippers, and therefore more likely to mistake common materials, including lithium batteries, as non-hazardous shipments. PHMSA has promoted this initiative within the beauty industry at the International Beauty Show, with plans to expand to home improvement, auto, and ecommerce/startup industries at similar events. These are all new markets that PHMSA has not previously engaged with in this capacity.

PHMSA will continue to release videos, public service announcements, news articles, and programmatic display promotions informed by incident data and other situational conditions. PHMSA is also exploring opportunities for increased promotion through modal and industry partners as well as other Federal agencies. Further information and promotional material can be found at: https://checkthebox.dot.gov/.

PHMSA has also developed a website[8] to host content and resources, including publications that aid compliance with the U.S. Hazardous Materials Regulations (49 CFR parts 171-180) and ICAO Technical Instructions. These lithium battery-specific resources aim to promote a better understanding of the requirements and the methods of compliance, as well as describe the actions required to comply.

In 2018, PHMSA, in coordination with the FAA, led two targeted outreach operations, one in New Jersey and one in Florida, which targeted air carriers and freight forwarders, to provide engagement materials and informal guidance on shipping lithium batteries and other dangerous goods. The efforts were focused on ensuring compliance, and providing stakeholder engagement and points of contact to hazardous material shippers. PHMSA employees provided hazardous

[8] https://www.phmsa.dot.gov/lithiumbatteries

materials outreach to more than 340 companies, including air carriers, shippers, and freight forwarders. Additionally, PHMSA held a separate event for ALPA, where it provided ALPA with the same information that was provided to industry and an overview of PHMSA's efforts to provide industry with a higher level of awareness of hazardous materials and the threats they pose while in transportation.

Additionally, PHMSA has developed and distributed multiple job-aid publications[9] regarding the safe transportation of lithium batteries. Examples include "How to Safely Send Batteries and Battery Powered Devices by Mail." PHMSA is currently updating and expanding its guidance material on shipping lithium batteries, and plans on increasing its global impact by translating certain finished products into other languages, such as Standard Chinese. The documents are made available on PHMSA's website, and distributed at various stakeholder outreach events, such as conferences, fora, and training seminars.

Internationally, PHMSA has engaged in discussions with the International Air Transport Association (IATA) to participate in lithium battery safety outreach initiatives. In 2019, PHMSA participated in a safety workshop in the Netherlands and a lithium battery safety webinar including over 200 global participants. These engagement efforts brought together representatives from lithium battery manufacturers, freight forwarders, ground handling agents, airlines, trainers, and regulators, to discuss existing and planned requirements for shipping lithium batteries by air, and leveraged existing meeting infrastructures and contacts provided by IATA. PHMSA plans to continue engaging with international shippers, carriers and regulatory counterparts on lithium battery safety issues at every opportunity. The next lithium battery workshop is scheduled to be held from October 6-8, 2020 in Manchester, United Kingdom and additional IATA hosted webinars are planned for 2020.[10]

Additionally, PHMSA has begun discussions with the U.S. Department of State to initiate an Asia-Pacific Economic Cooperation (APEC) concept to conduct a workshop addressing capacity building in the safe transport of lithium batteries by air within the Transportation Working Group. This workshop would bring together APEC member governments to discuss training and outreach to shippers and carriers of lithium batteries.

Lastly, in June 2019, PHMSA and the FAA jointly participated in a lithium battery workshop, in collaboration with the United Kingdom Civil Aviation Authority, discussing all segments in the lifecycle of a battery to promote compliance with existing regulations. The meeting provided a forum for the exchange of technical information between experts from manufacturing, testing, logistics, airlines, and regulators, related to methods to mitigate lithium battery hazards, within and outside the aviation system.[11]

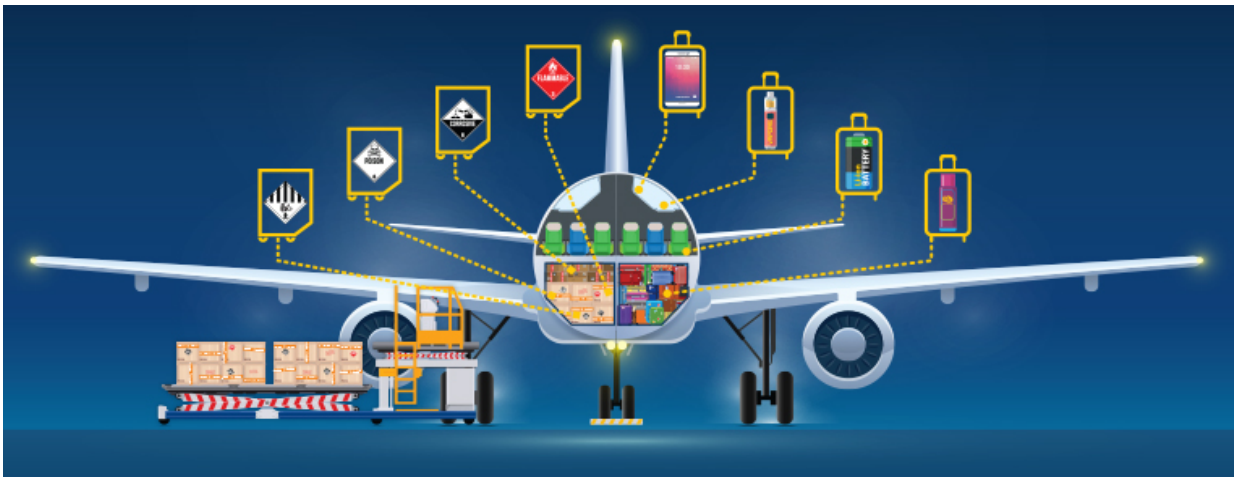
[9] https://www.phmsa.dot.gov/lithiumbatteries
[10] https://www.iata.org/events/cargo-events/Pages/lb-workshop.aspx
[11] https://www.icao.int/safety/DangerousGoods/DGP27/DGP.27.IP.012.3.en.pdf

FAA Outreach and Engagement Initiatives

Because the public naturally associates the FAA with air transportation, FAA provides public awareness and educational campaigns for the air transportation of common dangerous goods, such as lithium batteries, that specifically target air passengers, air cargo shippers, and air carriers. Since 2017, FAA has been dedicated to providing innovative, multimedia, cross-platform resources to reduce undeclared dangerous goods shipments by air. The FAA has implemented three initiatives (SafeCargo for air cargo shippers, PackSafe for passengers, and OperateSafe for air carriers) that provide targeted aviation-related messaging and interactive resources.

SafeCargo	PackSafe	OperateSafe
Shippers & Start-Ups • Interactive shipping guides for most frequently undeclared items. • Videos	**Passengers** • Check the chart for safe start! • Interactive tool and videos to help passengers pack for flights.	**Air Carriers** • Resources to better identify undeclared shipments and report discrepancies.

To further reduce the amount of undeclared dangerous goods in air transportation, FAA launched a new dangerous goods website on January 8, 2018.[12] This innovative website is designed to further raise the awareness of undeclared dangerous goods by providing interactive, targeted content and resources that stakeholders can easily access to find answers to their questions. The website consolidates the videos, interactive guides, and content used throughout various FAA dangerous goods campaigns.



FAA has developed several videos to support the SafeCargo and PackSafe campaigns. In December 2018, FAA and Amazon collaborated on four videos to target undeclared dangerous

[12] https://www.faa.gov/hazmat/

goods shipments. One video directly addresses lithium battery basics. Another video on Common Dangerous Goods highlights batteries in multiple household scenarios. These videos were shared on FAA's website, social media, and at national stakeholder engagement events attended by FAA. Amazon is also currently promoting the video with shippers on their "Seller's University" website, increasing the visibility of the messaging.

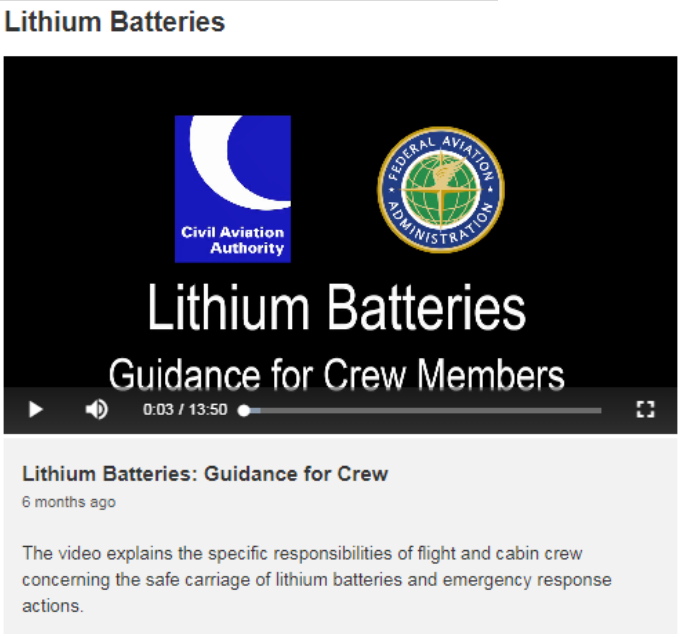
Additionally, for the PackSafe campaign, FAA developed a 90-second animated video to explain what items, including lithium batteries, are permitted to be in checked versus carry-on baggage, or not allowed at all, on most commercial flights. The video connects passengers to the FAA PackSafe website for additional products and details.

In addition to general educational campaigns, FAA also uses stakeholder engagement to provide targeted outreach. Stakeholder engagement is the commitment to collaborate with aviation dangerous goods stakeholders to reduce risk to the National Airspace System (NAS) through collaborative education and communication efforts. FAA continuously attends high-impact national stakeholder engagement events to reach stakeholders with the highest risk of undeclared dangerous goods. The aviation supply chain also includes agents that perform pre-transportation functions (product manufacturer, package manufacturer, shipper, freight forwarder, and offeror).

One such event is the Consumer Electronics Show (CES). To focus risk reduction of both declared and undeclared lithium batteries in the aviation system, FAA utilizes the significant opportunities that CES provides. CES allows FAA to directly engage lithium battery manufacturers, electronic device manufacturers, and shippers of both, to raise awareness of the risks posed by batteries, and provide web-based educational tools to enhance aviation safety. Many of the attendees are not familiar with the regulations pertaining to the safe transportation of lithium batteries and dangerous goods. The main goal of this engagement is to establish the FAA as a one-stop shop for information on the safe transportation of dangerous goods in the airspace, and empower manufacturers to transport these materials safely. CES provides a platform for the FAA to engage stakeholders representing all lithium battery technologies. Roughly 90 percent of the exhibitors are expected to transport their products by air. CES attracted representatives from 160 countries, more than 150 government officials, more than 6,600 media representatives, and more than 182,000 attendees. More than 63,700 of the people attending were from international locations.

The FAA utilizes social media, not only for CES, but also all year long for various events, safety concerns, and awareness information relating to the safe transport of dangerous goods by air. Social media provides an opportunity to push timely messaging and amplify the reach of new content or events. The FAA engages stakeholders through Twitter, Facebook, Instagram, YouTube, LinkedIn, and the FAA Dangerous Goods website. FAA develops messages on specific dangerous goods and lithium battery safety topics that are then posted on the various social media platforms. FAA also supports SafeCargo and PackSafe campaign for undeclared dangerous goods through the use of hashtags on Twitter (#SafeCargo and #PackSafe). FAA's integration of social media platforms in disseminating the aviation safety message and concerns on lithium batteries has allowed it to have a larger impact and presence informing passengers and businesses engaging in air transportation. FAA will continue to promote lithium battery safety and compliance with its ongoing stakeholder engagement efforts.

Additionally, since a major lithium metal battery incident in Los Angeles in 1999, the FAA has been investigating incidents and implementing specific research on lithium batteries and their unique safety concerns to aviation. Research activities by the FAA Fire Safety Branch located at the FAA William J. Hughes Technical Center in Atlantic City, New Jersey, provided a more complete understanding regarding the potential hazards of lithium batteries, and identified gaps where safety controls were ineffective.[13] The FAA Technical Center's research data, and the potential hazards of lithium batteries in aviation it identified, have been reported, and influenced the safety discussion and priorities within FAA and the Department. It also has influenced U.S. industry, other U.S. agencies, worldwide industry, and worldwide governments. For example, as a result, the FAA Technical Center and United Kingdom Civil Aviation Authority collaborated on lithium battery safety videos to provide information for air operators.



FAA supports voluntary compliance efforts that are part of the aviation safety system. The FAA provides safety information to all air carriers by way of dissemination of notices, such as Advisory Circulars (AC); Information for Operators (InFO), Safety Alerts for Operators (SAFO), Notices to Airmen (NOTAM), General Notices (GENOT), and Temporary Flight Restrictions (TFR). FAA has published more than 20 of these varied notices directly addressing lithium battery safety.[14] FAA will continue to publish notices to address specific risks, as needed. FAA will also continue to promote the observance of all applicable notices.

In addition, FAA participates in industry standards development organizations, such as the Radio Technical Commission for Aeronautics (RTCA); SAE; ASTM International (formerly known as the American Society for Testing and Materials); and the International Organization for Standardization (ISO), to provide consistency of information and ease of incorporation, if possible. All of these efforts are ongoing.

Continued Outreach and Engagement Efforts

Stakeholders have varying levels of understanding regarding their responsibilities related to the safe transportation of dangerous goods. Targeted communication, based on stakeholder understanding, roles, and responsibilities, is critical and ever-evolving. As a result, the Department will continue to develop new initiatives and campaigns to educate the public on risks associated with air transport of dangerous goods, such as lithium batteries. In support of this, the Department will continue to target industries that can be more susceptible to undeclared lithium battery shipments (e.g., auto, e-commerce/startups). National and international safety promotion

[13] https://www.fire.tc.faa.gov/
[14] https://www.faa.gov/hazmat/resources/lithium_batteries/; https://www.faa.gov/hazmat/resources/guidelines/

provides critical safety messaging to shippers, air carriers, and travelers, to increase their awareness and interest in dangerous goods safety.

Compliance Initiatives for Global Lithium Battery Safety

In addition to stakeholder engagement activities and training, the Department supports collaborative efforts with the international aviation community to support compliance with lithium battery safety regulations. In March 2019, PHMSA published an interim final rule adopting ICAO Technical Instructions addressing the safe air transportation of lithium batteries,[15] and PHMSA's and FAA's continued participation in the international aviation community has resulted in new proposals to promote the safe transportation of lithium batteries both domestically and internationally.[16]

The activities covered by this section of the report address paragraphs (e)(2)(B)-(C) and (F) of Section 333 of the FAA Reauthorization Act of 2018.

Lithium Battery Inter-Agency Coordination Group

In the interest of working together and reducing lithium battery noncompliance, PHMSA leads the Lithium Battery Inter-Agency Coordination Group, which includes members representing 15 Federal agencies, including the FAA, FMCSA, Customs and Border Protection (CBP), and the Consumer Product Safety Commission (CPSC). This Group provides a resource to bring together Federal agencies with a shared interest in the safe transport and use of lithium batteries by creating and instituting lithium battery enforcement strategies across Federal agencies and jurisdictions, and operating as a forum for group members to coordinate information sharing and education. The Lithium Battery Inter-Agency Coordination Group also provides participating agencies a unique forum for the sharing of information on noncompliant dangerous goods shipments. Through this effort, PHMSA has shared, and continues to share, incident and undeclared shipment data with group members to help focus on shippers that have experienced frequent issues during the shipment of lithium batteries and equipment packed with, or containing, lithium batteries.

An example of coordination with other governmental agencies is the work done concerning imported self-balancing hoverboards. In 2015, there were approximately 100 instances of fires and injuries resulting from the use of these hoverboards, which were bound to have both safety and trademark infringement issues. Many of the members of the Lithium Battery Inter-Agency Coordination Group (e.g., PHMSA, CPSC, and CBP) worked to inspect incoming shipments and to verify batteries utilized in hoverboards were from a reputable source. The work resulted in the recall of more than half-a-million hoverboards, and highlighted to product manufacturers and distributors the importance of using batteries of a tested and approved type.

Another example of coordinated compliance on lithium battery safety is the Department's response to the Samsung Galaxy Note 7 battery fires and subsequent recall. In October 2016, the Department, in coordination with CPSC, issued an Emergency Order to ban all Samsung Galaxy

[15] 84 Fed. Reg. 8006 (Mar. 6, 2019).
[16] 83 Fed. Reg. 60970 (November 27, 2018).

Note 7 smartphone devices from air transportation in the United States. Individuals who owned or possessed a Samsung Galaxy Note 7 device were not permitted to transport the device on their person, in carry-on baggage, or in checked baggage on flights to, from, or within the United States. PHMSA and the FAA also worked with Samsung to develop practices to facilitate the safe shipment of phones being returned. To ensure success, PHMSA, FAA, and CPSC held follow-up meetings with Samsung representatives to monitor the progress of the recall effort. As result of the actions taken, the recall resulted in over 92 percent of the 1.9 million affected phones being successfully recalled.

Many of the Federal Government partners from the Lithium Battery Inter-Agency Coordination Group now participate in the Lithium Battery Safety Working Group mandated by Section 333(c), which promotes and coordinates efforts related to promotion of safe manufacture, use and transportation of lithium batteries and cells. The working group has been holding bi-weekly meetings since September 9, 2019.

Safety Compliance and Enforcement

Even with the significant effort to identify all hazards, and engaging the various stakeholders involved in the transport of lithium batteries in air transport, incidents and noncompliance will, and do, still occur. The activities covered by the safety compliance and enforcement section of this report address paragraphs (e)(2)(B)-(D) of Section 333 of the FAA Reauthorization Act of 2018.

DOT's Compliance and Enforcement

The Department provides an essential component to the safety resolution process.

PHMSA has oversight of entities that offer hazardous materials for transportation; and that manufacture, requalify, rebuild, repair, recondition, or retest packaging (other than cargo tanks and tank cars) used to transport hazardous materials. PHMSA's Office of Hazardous Materials Safety Field Operations division serves to ensure transportation safety and security by conducting compliance, incident, and accident response and investigations; performing safety, performance, and regulatory adequacy and fitness determinations; executing outreach, education, and training activities; and providing feedback, information, and intelligence through its nationwide operations. PHMSA also works to address reports of lithium battery incidents, as lithium battery incidents occur in all modes of transportation.

The FAA has oversight of the NAS. The authority to carry out the investigations and enforcement relating to the transportation or shipment of hazardous materials by air has been delegated to the FAA Administrator under 49 CFR § 1.183(d)(1). FAA's Office of Security and Hazardous Materials Safety is evolving oversight to a risk-based management approach that embraces many interdependent principles, including Risk Based Decision Making, Safety Management Systems,[17] FAA's Compliance Program,[18] and voluntary safety reporting

[17] https://www.faa.gov/about/initiatives/sms/
[18] https://www.faa.gov/about/initiatives/cp/

programs.[19] This enables a proactive approach to safety, intended to prevent aviation accidents. However, the FAA also reacts to, and investigates, if appropriate, all reported lithium battery incidents. For example, in CY 2018 there were 50 air/airport incidents with smoke, fire, or extreme heat involving lithium batteries.[20] The FAA initiates civil penalty action against persons who offer, for transportation by air, lithium battery shipments that fail to comply with the Hazardous Materials Regulations. The civil penalties sought for noncompliant lithium battery shipments are generally higher because of their significant safety risk. The Lithium Batteries Severity Level table assigns severity levels for lithium battery shipments given the nature and quantity of the batteries involved (e.g., number of cells or batteries, Watt-hour rating, and mass) and the packaging of the shipment.[21] The FAA also has authority under 49 C.F.R. part 109 to issue emergency orders to prevent the shipment of lithium batteries by air transportation if the Administrator determines that such shipment is causing an imminent hazard.[22]

Both agencies' compliance and enforcement programs are designed to promote compliance with the statutory and regulatory requirements, and are applicable to all activities regulated or enforced by the respective agency. The programs provide a wide range of options for addressing noncompliance. These options include: Administrative Action in the form of either a warning notice or letter of correction; Informal Action; Civil Penalties; and referrals for criminal prosecution. The impact and risk to the transportation system are always evaluated to determine the appropriate actions when a violation or noncompliance occurs. The agencies take the action most appropriate to promote safety and compliance with the standards and regulations, with the focus always on the root cause of the noncompliance. The initial priority of the agencies is to correct any ongoing noncompliance. Both agencies provide public reporting on civil penalties and certain enforcement cases, but this reporting does not include the number of actions involving a specific hazardous material commodity, such as lithium batteries.[23]

International Compliance and Enforcement

International enforcement poses special challenges. Due to the extensive supply chain in some countries, identifying the responsible person or organization for a noncompliance can be very difficult, and necessitates enlisting the appropriate foreign civil aviation authorities. Coming to a resolution with a foreign party can be complicated, especially if it does not have a presence in the United States, or the U.S. standards differ from international standards. To use every available tool to promote the most effective way to correct ongoing noncompliance, the agencies share information on noncompliance of dangerous goods shipments with Federal, regional, and international partners during investigations, as appropriate. To that end, the FAA and PHMSA support ICAO Annex 18, Section 11.2, which establishes that States should participate in cooperative efforts with other States concerning violations or noncompliance with the dangerous goods requirements, with the aim of eliminating such violations or noncompliance. Dangerous goods incidents in air transportation and noncompliance that are determined to have originated

[19] https://www.faa.gov/hazmat/air_carriers/compliance_enforcement/
[20] https://www.faa.gov/hazmat/resources/lithium_batteries/media/Battery_incident_chart.pdf
[21] See FAA Order 2150.3C, Chapter 10, which provides specific sanction guidance for lithium battery shipments.
[22] See Emergency Restriction/Prohibition Order issued to Braille Battery, Inc. on September 16, 2016.
[23] PHMSA Hazmat Enforcement Actions, https://www.phmsa.dot.gov/regulatory-compliance/hazmat/enforcement-decisions; FAA Enforcement Reports, https://www.faa.gov/about/office_org/headquarters_offices/agc/practice_areas/enforcement/reports/

from an international location will be considered for referral to that State for appropriate action to correct any ongoing noncompliance. The State referrals on dangerous goods incidents will contain information the FAA has gathered about the incident, so the State can investigate further and take any appropriate action. In CY19 FAA updated internal processes for international referrals to support organizational changes to the FAA Hazardous Materials Safety Program and implementation of updated database tools.[24] This collaboration between States continues to grow, and will be further developed by FAA outreach. As the lithium battery industry continues to grow, this will continue to be a key component of a safety resolution program.

Summary

The Department has taken, and continues to take, a comprehensive, cooperative approach to improve compliance with safety regulations for air transport of lithium batteries through stakeholder engagement and enforcement activities. As detailed in this report, there are many ongoing activities to provide an international, systems- and risk-based approach to manage the risk of transporting lithium batteries and other dangerous goods via air transport. The Department is working in collaboration with stakeholders and international fora to further develop these efforts. We look forward to providing annual updates on our progress.

[24] https://www.faa.gov/hazmat/air_carriers/compliance_enforcement/