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Pipeline and Hazardous Materials
Safety Administration (PHMSA)

Office of Hazardous Materials Safety

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1. Introduction

This report satisfies the Secretary of Transportation’s obligation to report to the public biennially on six items.¹

The six items required by 49 U.S.C. § 5121(h) are:

- A statistical compilation of accidents and casualties related to the transportation of hazardous material (hazmat);
- A list and summary of applicable Government regulations, criteria, orders, and special permits;
- A summary of the basis for each special permit;
- An evaluation of the effectiveness of enforcement activities relating to a function regulated by the Secretary under 49 U.S.C. § 5103 (b)(1) and the degree of voluntary compliance with regulations;
- A summary of outstanding problems in carrying out this chapter² in order of priority; and
- Recommendations for appropriate legislation.

Table 1.1 pairs each statutory requirement with the report section satisfying that requirement.

Table 1.1 – Statutory Requirements matched with Report Location

Statutory Requirement	Statute	Location
A statistical compilation of accidents and casualties related to the transportation of hazardous material	49 U.S.C. § 5121(h)(1)	Section 3
A list and summary of applicable government regulations, criteria, orders, and special permits	49 U.S.C. § 5121(h)(2)	Section 4, Appendix A, Appendix B
A summary of the basis for each special permit	49 U.S.C. § 5121(h)(3)	Appendix A
An evaluation of the effectiveness of enforcement activities relating to a function regulated by the Secretary under 49 U.S.C. § 5103(b)(1) and the degree of voluntary compliance with regulations	49 U.S.C. § 5121(h)(4)	Section 5
A summary of outstanding problems in carrying out this chapter in order of priority	49 U.S.C. § 5121(h)(5)	Section 6
Recommendations for appropriate legislation	49 U.S.C. § 5121(h)(6)	Section 7

¹ PHMSA published the last report on January 22, 2021, which covered the 2015-2016 and 2017-2018 periods. The previous report is available on PHMSA’s website. <https://www.phmsa.dot.gov/news/report-congress-biennial-report-transportation-hazardous-materials-years-2015-2016-and-2017>

² 49 U.S.C. Chapter 51.

2. About Hazardous Materials Transportation Regulation and PHMSA

Under the Federal Hazardous Materials Transportation Law (Federal hazmat law; 49 U.S.C. § 5101 et seq.), the Secretary of Transportation is charged with protecting against the risks to life, property, and the environment that are inherent in the commercial transportation of hazmat. Federal hazmat law authorizes the Secretary of Transportation to prescribe regulations for the safe and secure transportation of hazmat in intrastate, interstate, and foreign commerce. The Secretary has delegated this authority to the Pipeline and Hazardous Material Safety Administration (PHMSA). 49 CFR 1.96.

PHMSA is an agency within the U.S. Department of Transportation (DOT) whose mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives.³ PHMSA regulates the transport of hazmat by all modes (air, rail, highway, and water) and pipelines transporting natural gas and hazardous liquids, including:⁴

- Over 1.2 million shipments daily,
- 2.97 billion tons shipped annually by all modes,
- Over 12% of all freight ton-miles shipped annually,
- Over 34 million containers entering U.S. ports annually,
- Overseeing the nation's pipeline infrastructure, which accounts for 65% of the energy commodities consumed in the United States.⁵

PHMSA partners with other DOT modal administrations and the Department of Homeland Security (DHS). In particular, PHMSA's Office of Hazardous Materials Safety (OHMS) works with the four agencies listed below to help administer their hazardous materials safety programs. Each of these agencies has authority delegated by the Secretary of Transportation to enforce the provisions of hazardous materials law and the regulations promulgated thereunder in 49 CFR Parts 171-180, known as the Hazardous Materials Regulations (HMR).

³ PHMSA. PHMSA's Mission. <https://www.phmsa.dot.gov/about-phmsa/phmsas-mission>

⁴ United States 2017 Economic Census: Transportation-2017 U.S. Commodity Flow Survey. https://www.bts.gov/sites/bts.dot.gov/files/pictures/2017%20CFS%20Final%20Data%20Report_0.pdf

⁵ Pipes Act of 2016 Implementation: Oversight of Pipeline Safety Programs. Hearing Before the Subcommittee on Railroads, Pipelines, and Hazardous Materials. June 21, 2018. <https://www.govinfo.gov/content/pkg/CHRG-115hhrg31569/pdf/CHRG-115hhrg31569.pdf>



• **Federal Aviation Administration (FAA)** enforces regulations governing the transportation of hazmat by air.



• **Federal Railroad Administration (FRA)** enforces regulations governing the transportation of hazmat by railroad.



• **Federal Motor Carrier Safety Administration (FMCSA)** enforces regulations governing transportation of hazmat by highway.



• **U.S. Coast Guard (USCG)** enforces regulations governing certain transportation of hazmat by water

Within PHMSA, the Office of Pipeline Safety (OPS) oversees the nation’s pipeline system and certain liquefied natural gas (LNG) facilities and OHMS oversees the modal transport of hazmat by air, highway, rail, and water. OPS and OHMS collaborate to jointly achieve PHMSA’s overall safety mission and employ a “one PHMSA” approach; however, this report focuses on OHMS’ oversight due to the statutory requirements.

Specifically, OHMS:

- Evaluates safety risks;
- Develops and enforces standards for transporting hazardous materials in commerce designed to address those risks;
- Investigates incidents and accidents, in particular when they involve hazmat packaging failures;
- Educates shippers, carriers, other members of the regulated community, and the public;
- Conducts and sponsors research; and
- Provides outreach and grants to improve emergency response.

Evaluate Safety Risks

OHMS evaluates safety risks by analyzing incident, commodity flow, and test data. Participating in technical standards and federal advisory committees is part of the analysis along with contributing to and sponsoring research and development (R&D) and studying changes in packaging and transportation technology. In addition, analysis includes reviewing National Transportation Safety Board (NTSB) recommendations, industry petitions, and requests for special permits and approvals from the regulated community.

While many factors contribute to hazmat risk, OHMS has substantial subject matter expertise to contribute to the investigation and analysis of the risks of hazmat packaging failures. This is

because the HMR establishes minimum Federal requirements for packaging specifications designed to ensure the containment of bulk and non-bulk quantities of hazardous materials. Bulk packaging includes cargo tanks used to transport hazmat via highway and rail tank cars that transport hazmat via rail. Non-bulk packaging includes United Nations (UN) specification steel drums and jerricans, glass receptacles, and fiberboard boxes. The HMR also contains specifications for other types of packaging such as aerosol containers, cylinders, and intermediate bulk containers (IBCs). Taken together, OHMS regulates this wide diversity of packaging and promotes a comprehensive safety system for the manufacturing, fabrication, marking, maintenance, reconditioning, repair, and testing of multi-modal containers marked, certified, or sold for use in the transportation of hazmat.⁶

This comprehensive safety system and oversight relies on the efforts and expertise of OHMS Sciences and Engineering staff. They analyze the performance of existing design criteria for packaging such as rail tank cars, cylinders, cargo tanks, IBCs, as well as innovative designs (e.g., satellite shipping containers, spacecraft cooling panels) and packaging materials (e.g., ferrous and non-ferrous alloys, fiberglass, graphite-epoxy composites). Sciences and Engineering staff members bring specialized knowledge of Non-Destructive Testing (NDT), Metallurgy, Failure Analysis, Finite Element Analysis, and Welding techniques. Additionally, the team contributes to development of voluntary consensus standards in collaboration with, for example, the Compressed Gas Association (CGA), American Society of Mechanical Engineers (ASME), Institute of Makers of Explosives (IME), International Organization for Standardization (ISO), and American Pyrotechnics Association (APA).⁷

Develop Standards

To develop the standards in the HMR, OHMS follows the Administrative Procedure Act to issue notices of proposed rulemaking (NPRMs) and, after considering public comments, final rules.⁸ OHMS staff diligently develop and manage complex rulemaking projects with technical breadth and depth, leading to substantial positive safety and economic impacts. Rulemaking documents are published in the Federal Register and may be viewed at www.regulations.gov, or accessed via the PHMSA website.⁹ Rulemaking activities are also summarized in the Unified Agenda of Regulatory and Deregulatory Actions, which is managed and published by the Office of Information and Regulatory Affairs (OIRA) within the Office of Management and Budget (OMB).¹⁰

OHMS staff also promote the development of standards and U.S. policy positions with respect to the International Civil Aviation Organization's Technical Instruction for the Safe Transport of Dangerous Goods by Air (ICAO TI, Annex 18); the International Maritime Organization's International Maritime Dangerous Goods Code (IMDG Code); and the United Nations (UN)

⁶ 49 U.S.C. § 5103 - General regulatory authority

⁷ 49 CFR §171.7 Reference material

⁸ Administrative Procedure Act (5 U.S.C. Subchapter II). <https://www.archives.gov/federal-register/laws/administrative-procedure>

⁹ <https://www.phmsa.dot.gov/>

¹⁰ Office of Information and Regulatory Affairs, Office of Management and Budget, Executive Office of the President. <https://www.reginfo.gov/public/do/eAgendaMain>

Model Regulations on the Transport of Dangerous Goods. In fact, OHMS has provided a subject matter expert to serve as the U.S. Head of Delegation (HOD) and Chair to the UN Sub-Committee of Experts for the Transportation of Dangerous Goods, as well as the U.S. HOD to ICAO.¹¹ OHMS also acts as the national competent authority and issues National Competent Authority Certificates for the international movement of radioactive materials; and provides an alternate U.S. member appointed to the International Atomic Energy Agency (IAEA) Transport Safety Standards Committee (TRANSSC).¹²

Enforce Standards and Investigate Incidents

To enforce standards in the HMR, OHMS enforcement personnel conduct field inspections of shipper and carrier transportation facilities; packaging manufacturing, requalification, repair, and reconditioning facilities; cargo vessel ports; rail freight yards; motor carrier and air cargo terminals; and chemical and explosive manufacturing plants. PHMSA has a full range of enforcement tools available to ensure that the hazmat transportation industry takes appropriate and timely corrective actions for violations, responds appropriately to incidents, and employs preventive measures to preclude future failures and non-compliant operations.

The enforcement program may issue Letters of Warning and Tickets for less serious violations¹³ and refers more serious matters to PHMSA's Office of Chief Counsel for appropriate sanctions, which include Notices of Probable Violation¹⁴ and Corrective Action¹⁵ and Compliance Orders.¹⁶ The Federal hazardous materials transportation law authorizes the Office of Chief Counsel to assess civil penalties, ranging from a minimum of \$540 for violations involving training to a maximum of \$209,249 for violations that result in death, serious illness, or severe injury to any person or substantial destruction of property, and to refer matters for criminal prosecution.¹⁷ Civil penalty amounts are adjusted annually using a statutorily mandated formula.¹⁸

OHMS Field Operations conducts Multi-Agency Strike Force Operations and joint inspection operations throughout the United States. Joint inspection operations give Field Operations the

¹¹ United Nations. Economic and Social Council. SUB-COMMITTEE OF EXPERTS ON THE TRANSPORT OF DANGEROUS GOODS. List of Head of Delegation. <https://unece.org/sites/default/files/2022-03/list-HoD%20TDG.pdf>. See also the Report of the Sub-Committee of Experts on the Transport of Dangerous Goods on its sixtieth session (June 27-July 6, 2022; Geneva, Switzerland). <https://unece.org/sites/default/files/2022-07/ST-SG-AC.10-C.3-120.e.docx>

¹² International Atomic Energy Agency. TRANSSC Members - Term 2021-2023. <https://www-ns.iaea.org/committees/transsc/default.asp?fd=1898&dt=0>

¹³ 49 CFR §107.309 and §107.310

¹⁴ 49 CFR §107.311

¹⁵ 49 CFR, Appendix A to Subpart D of Part 107—Guidelines for Civil Penalties

¹⁶ 49 CFR §107.307(a)(3)

¹⁷ Revisions to Civil Penalty Amounts. Docket ID: FAA-2013-0259. Document ID: 2022-04456. Document Citation: 87 FR 15839. <https://www.federalregister.gov/documents/2022/03/21/2022-04456/revisions-to-civil-penalty-amounts>

¹⁸ See the Federal Civil Penalties Inflation Adjustment Act of 1990 (FCPIAA), Public Law 101-410, as amended by the Federal Civil Penalties Inflation Adjustment Act Improvements Act of 2015 (2015 Act), [Public Law 114-74](#), 129 Stat. 599, codified at [28 U.S.C. 2461 note](#). The FCPIAA and the 2015 Act require Federal agencies to adjust minimum and maximum civil penalty amounts to preserve their deterrent impact. The 2015 Act amended the formula and frequency of the adjustments.

opportunity to provide hazmat training to other government personnel, whose focus may not be hazardous material safety. Furthermore, Field Operations provides expertise as subject matter experts when evaluating hazardous material shipments that come into U.S. ports.

Field Operations has participated in several large-scale, investigation task forces focused on the safe shipment of hazardous materials. These investigations were national in scope and involved the coordination of investigators from PHMSA, modal partners at DOT, and DHS. For example, *Operation Safe Storage* was a national investigation focused on the shipment of ammonium nitrate to confirm the safe entry and storage of over 3,000 shipments into the United States. As another example, the *Sodium Cyanide National Task Force* focused on the safety and security risks in the transportation lifecycle posed by current methods for packaging sodium cyanide. Field Operations, along with DHS, inspected import shipments and packages at user facilities to ensure that packages met safety requirements. Field Operations also tested commonly used packages to determine viability of those package designs.

In response to the COVID-19 pandemic, Field Operations, DHS, and the Food and Drug Administration leveraged resources to enable distilleries to produce, package, and transport hand sanitizer safely throughout the U.S. Furthermore, Field Operations conducted joint inspections focused on undeclared, unauthorized shipments of hand sanitizer imported into the United States, as well as outreach opportunities to assist distilleries with HMR compliance.

During 2019-2020, PHMSA investigators assisted the Office of Inspector General (OIG) in criminal investigations. Investigators supported OIG as the subject matter experts in evaluating the shipment of undeclared fireworks, body parts in regulated medical waste, and undeclared shipment of refrigerant gases in cylinders. Investigators also determined that a company altered a DOT hazmat registration.

In addition, investigators supported DHS and the United States Postal Service in identifying undeclared shipments of hazardous materials. In particular, PHMSA's Accident Investigation Team responded to several train derailments and other hazardous materials incidents, where they provided technical assistance to emergency responders and coordinated with DOT headquarters to provide real-time information on the status of the incidents.

When these incidents unfortunately occur, the shippers or carriers involved may be required to file incident reports to OHMS, using PHMSA Incident Report Form 5800.1 and specifying the facts and circumstances of the incident and causes of the incident to the extent they are known.¹⁹ After these reports are reviewed and validated, they are made publicly available through the Hazmat Incident Report Search Tool²⁰ on the PHMSA website.

¹⁹ Hazardous Materials Incident Report. Form DOT F 5800.1 (01-2004).

<https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/IncidentForm010105.pdf>

²⁰ Incident Statistics. <https://www.phmsa.dot.gov/hazmat-program-management-data-and-statistics/data-operations/incident-statistics>

Educate the Regulated Community and Public

In addition to the importance of enforcement and investigation for ensuring safety and compliance with the HMR, education, outreach, and training are also important. OHMS educates the regulated community, emergency responders, and the public by developing and disseminating training and outreach materials like the Emergency Response Guidebook (ERG),²¹ hosting webinars, public meetings, and town halls; publicizing awareness campaigns such as PHMSA’s “Check the Box” program;²² and engaging hazmat businesses, both large and small, through face-to-face outreach and field compliance assistance by the OHMS Field Operations Community Liaison (CL) Team.²³

The Field Operations CL Team has hosted numerous outreach and training seminars to assist and train Federal and State partners, interested parties, and associations.²⁴ For example, CL personnel focused on stakeholders who manufactured and shipped hand sanitizer regarding the requirements to meet the hazardous materials regulations. CL personnel provided an outreach campaign based on “Check the Box,” delivered information on the safe transportation of hazardous materials and answered questions during conferences throughout the country. CL personnel also wrote two articles promoting hazardous material safety. The Commercial Vehicle Safety Alliance’s (CVSA) Guardian magazine was provided with information on inspections and outreach efforts. CL personnel created a mass mailing, safety flyer for generators, haulers, and treatment facilities.

As an additional help to educate the public, OHMS supports the Hazardous Materials Information Center (HMIC), which provides live, one-on-one assistance by answering calls and emails from the public regarding the HMR and PHMSA programs.²⁵ Further, OHMS publishes Letters of Interpretations to address specific requests to clarify technical aspects of the HMR; these letters are also found on the PHMSA website.²⁶

In addition to educating and engaging the industry and public, OHMS supports professional development within its agency and for counterpart hazmat and transportation professionals. In particular, the National Training and Qualification (NTQ) program established the Critical Task Selection Board Working Group to identify critical hazardous materials training courses and national standards and develop a certification level for hazardous materials training competencies. The NTQ branch provided training to all the DOT modes who conduct hazmat inspections, NTSB, Transport Canada, U.S. Customs and Border Protection (CBP), and other government agencies.

²¹ Hazardous Materials Outreach & Training. <https://www.phmsa.dot.gov/training/hazmat/hazardous-materials-outreach-engagement>

²² U.S. Department of Transportation, “Check the Box.” <https://www.transportation.gov/check-the-box>

²³ Hazardous Materials Community Liaison Team (CL). <https://www.phmsa.dot.gov/training/hazmat/hazardous-materials-safety-assistance-team-hmsat>

²⁴ PHMSA website. Hazardous Materials Community Liaison Team (CL). <https://www.phmsa.dot.gov/training/hazmat/hazardous-materials-safety-assistance-team-hmsat>

²⁵ Hazardous Materials Information Center. <https://www.phmsa.dot.gov/standards-rulemaking/hazmat/hazardous-materials-information-center>

²⁶ Hazmat Letters of Interpretation. <https://cms7.phmsa.dot.gov/regulations/title49/b/2/1/list?filter=Hazmat>

Conduct and Sponsor Research

As the standards, technologies, and knowledge surrounding hazardous materials transportation continue to evolve, research becomes a critical component of PHMSA's safety mission. To this end, OHMS funds and conducts numerous research and development (R&D) projects. PHMSA's R&D investments in hazardous materials safety help to shape the future of the organization with an effective, efficient, and proactive focus on initiatives that produce the most successful safety solutions, especially to address emerging risks. These investments support new technologies, laboratory testing, pilot programs, and field implementation, as well as white papers, reports, and training manuals. Reports from completed R&D projects²⁷ and information on ongoing projects and R&D funding opportunities are available on the PHMSA website.²⁸ The OHMS Research, Development and Technology (RD&T) branch also hosts an annual forum to showcase funded research projects and share insights and opportunities with stakeholders. The RD&T branch can be contacted via HazMatResearch@dot.gov.

Provide Outreach and Grants

In addition to funding research, OHMS manages and funds a variety of grants for emergency responders. The Hazardous Materials Grants Program includes the following grants²⁹:

- Hazardous Materials Emergency Preparedness (HMEP),
- Assistance for Local Emergency Response Training (ALERT),
- Hazardous Materials Instructor Training (HMIT),
- Supplemental Public Sector Training (SPST), and
- Community Safety (CS).

The HMEP grant program was first authorized in 1990 and currently funds approximately \$24 million on an annual basis to grantees from U.S. states, territories, and Native American tribes to train public-sector hazardous materials responders.³⁰ Funded activities include: developing or revising emergency plans and training activities to account for the bulk transportation of energy products by rail and over the road; conducting commodity flow studies to determine the frequency and quantity of hazmat shipments being transported through local communities; and training emergency responders to respond appropriately to incidents involving bulk shipments of energy products as well as other hazmat.³¹

ALERT currently grants around \$1.2 million to specifically promote hazmat response training on the transportation of crude oil, ethanol, and other flammable liquids by rail, consistent with

²⁷ PHMSA. R&D Reports. <https://www.phmsa.dot.gov/hazmat/reports/rd-reports>

²⁸ PHMSA. Research and Development Branch. <https://www.phmsa.dot.gov/research-and-development/hazmat/research-and-development-branch>

²⁹ PHMSA Grants. Hazardous Materials Grants. <https://www.phmsa.dot.gov/about-phmsa/working-phmsa/grants>

³⁰ PHMSA Grants. Hazardous Materials Grants. Hazardous Materials Emergency Preparedness (HMEP) Grant. PHMSA FY 2022 Pipeline and Hazmat Safety Grants Listing. <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2022-11/PHMSA-FY2022-Hazardous-Materials-Grants-Report.pdf> [hereinafter FY2022 OHMS Grants Report]

³¹ 2020 Pipeline and Hazmat Safety Grants. <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/2020-08/PHMSA%20FY20%20Comprehensive%20Grants%20List.pdf>

National Fire Protection Association (NFPA) standards;³² HMIT grants approximately \$3.8 million in funding to non-profit organizations that demonstrate expertise in conducting “train-the-trainer” programs.³³ SPST grants approximately \$1.7 million in funding to national, non-profit fire service organizations for the purpose of training individuals with statutory responsibility to respond to hazardous materials accidents and incidents;³⁴ CS grants provide \$1 million in funding on a competitive basis to non-profit organizations that develop best practices guidance for hazardous materials response.³⁵ PHMSA provides more information on hazardous materials grants, including recent recipients and amounts, in annual reports on the PHMSA website.

This section provided an overview of some of the various ways that OHMS contributes to PHMSA’s safety mission. Much more information is available, especially through the PHMSA website – <http://www.phmsa.dot.gov>, which has contact information for OHMS programs and staff – and the Hazardous Materials Information Center (1-800-HMR-4922; infocenter@dot.gov).

The remainder of this report is dedicated to the statutory requirements for this report that were specified in Table 1.1.

³² See FY2022 OHMS Grants Report and Assistance for Local Emergency Response Training (ALERT) web page. <https://www.phmsa.dot.gov/grants/hazmat/assistance-local-emergency-response-training-alert>

³³ See FY2022 OHMS Grants Report and Hazardous Materials Instructor Training (HMIT) Grant web page. <https://www.phmsa.dot.gov/grants/hazmat/hazardous-materials-instructor-training-hmit-grant>

³⁴ See FY2022 OHMS Grants Report and Supplemental Public Sector Training (SPST) Grant web page. <https://www.phmsa.dot.gov/grants/hazmat/supplemental-public-sector-training-spst-grant>

³⁵ See FY2022 OHMS Grants Report and Community Safety (CS) Grant web page. <https://www.phmsa.dot.gov/grants/hazmat/community-safety-cs-grant>

3. Statistical Compilation of Accidents

PHMSA uses reported incident data provided on DOT Form 5800.1 to assess safety trends and guide the development of new initiatives to enhance hazardous materials transportation safety.³⁶ DOT Form 5800.1 captures relevant data about each reported incident, including the location, cause, and consequences of the hazmat release.³⁷ The data collected is specific to OHMS's regulatory authority and primarily focuses on the material, packaging, and consequences of a package failure. The data reported in this section uses a specific vintage of incident data, dated May 6, 2022, from the PHMSA Data Mart for Hazardous Materials.³⁸ The most recent, published incident data can be accessed using the Hazmat Incident Report Search Tool.³⁹

3.1 Hazmat Incidents with Death or Major Injury (Targets vs. Actual)

For 2019-2020, PHMSA used the number of hazardous material incidents with death or major injury as its main performance indicator and how the agency measures the effectiveness of its programs. PHMSA reported these numbers to the Secretary on the Department of Transportation's quarterly scorecard. For 2019 and 2020, the maximum target for incidents was 25 and 24, respectively. This is a change from 2015-2018, when the target for incidents with death or major injury was a range between 20 and 31.

Figure 3.1 shows the 2015-2020 performance targets and the actual number of incidents with death or major injury. In 2015, the number of incidents with death or major injury exceeded PHMSA's target maximum, but from 2016-2018, this number receded to below the target maximum. The number of incidents involving death or major injury was below the target in 2019, and above the target in 2020.

The increase from 2019 to 2020 could be due to various factors. Nevertheless, the 2020 figure (30) did not exceed previous highs – e.g., 2015 (38), 2011 (35) – and is approximately in line with the number of incidents with death or major injury reported in 2013 and 2014 (29), even as certain measures for hazardous materials transportation indicate increasing activity over time. Specifically, between 2012 and 2017, U.S. Census data show an increase of 15% for the number of tons transported; an increase of 24% for the number of ton-miles transported; and an increase of 66% for the average miles per shipment.⁴⁰ Different commodity flow data would be needed to further investigate these trends and evaluate if they continued into the reporting period (2019-2020).

³⁶ Docket 2137-0039, Supporting Statement A (describing how, by whom, and what purpose the information on the DOT Form F 5800.1 is used for). https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=202004-2137-004

³⁷ PHMSA Hazardous Materials Incident Report. Form Approval OMB No. 2137-0039. <https://www.phmsa.dot.gov/sites/phmsa.dot.gov/files/docs/IncidentForm010105.pdf>

³⁸ PHMSA Data Mart for Hazardous Materials. May 6, 2022. Hazardous Materials Incident Data sourced from the PHMSA 5800.1 Hazardous Materials Incident Report Form. <https://portal.phmsa.dot.gov>. Also accessible via the Hazmat Incident Report Search Tool: <https://www.phmsa.dot.gov/hazmat-program-management-data-and-statistics/data-operations/incident-statistics> [hereinafter PHMSA Hazmat Incident Database]

³⁹ Ibid., Hazmat Incident Report Search Tool.

⁴⁰ U.S. Census. Commodity Flow Survey. CF1700H01 Hazardous Materials Series: HazMat Shipment Characteristics by Mode for the United States: 2017 and 2012. <https://data.census.gov/> [2012 and 2017 totals for "All modes"]

Figure 3.1: Performance Indicator Targets vs. Actual

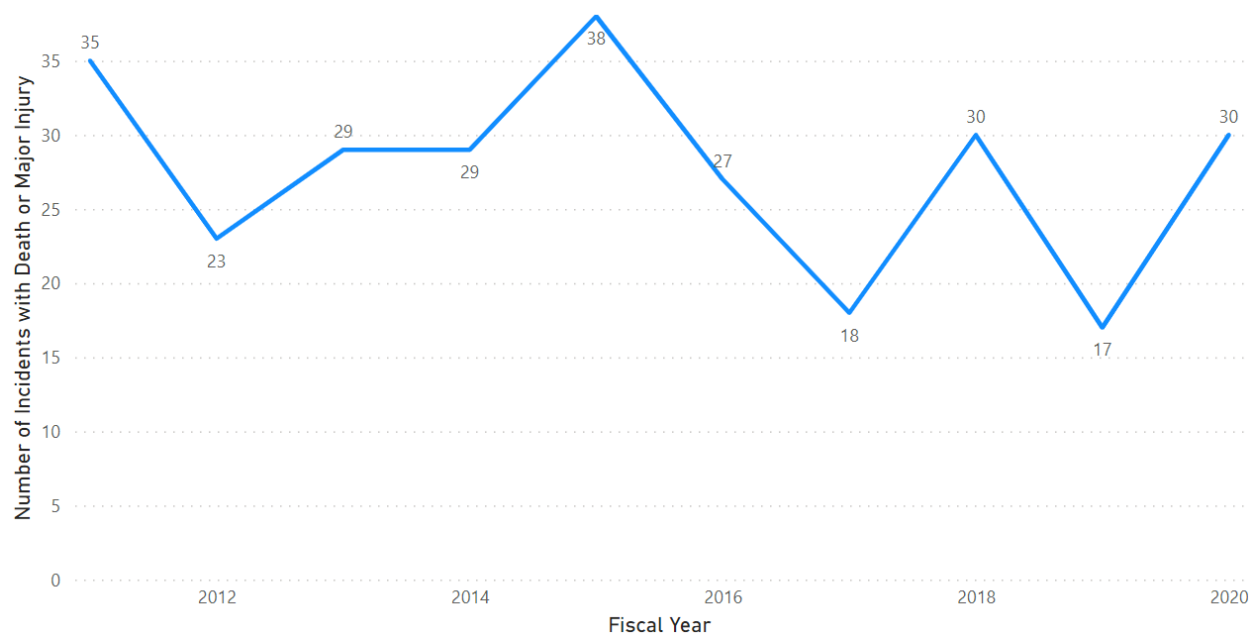
Number of hazardous materials incidents involving death or major injury	2015	2016	2017	2018 ^[1]	2019	2020
<i>Target</i>	20-31	20-31	20-31	20-31	25	24
<i>Actual</i>	38	27	18	30	17	30

[1] For the purposes of this report, PHMSA is presenting the 2018 performance target as 20-31 to represent the target range of hazardous materials incidents involving death or major injury. However, in 2018, PHMSA used a performance target of 63 to account for fatalities caused by the release of hazardous materials, including Pipeline incidents. See PHMSA Performance Reports and Performance Plans, e.g., *FY 2022 Performance Plan and FY 2020 Performance Report* <https://www.transportation.gov/budget>

3.2 Hazmat Incidents with Death or Major Injury Over Time

Figure 3.2 shows the historical context for the annual number of incidents with death or major injury, which has ranged from 17 to 38 incidents per year between fiscal years, 2011 and 2020. This count does not include international incidents with death or major injury. Despite year-to-year variance, the long-term, multi-year trend is stable.

Figure 3.2: Count of incidents with death or major injury⁴¹ (FY 2011-2020)



⁴¹ PHMSA Hazmat Incident Database (counting unique Report Numbers, where HAZMAT_HOSPITALIZED_EMPLOYEES>0, HAZMAT_HOSPITALIZED_RESPONDERS>0, HAZMAT_HOSPITALIZED_GEN_PUBLIC>0, HAZMAT_FATALITY_GENERAL_PUBLIC>0, HAZMAT_FATALITIES_EMPLOYEES>0, or HAZMAT_FATALITIES_RESPONDERS>0, for each fiscal year from 2011 to 2020).

3.3 Hazmat Incidents with Respect to U.S. Geography

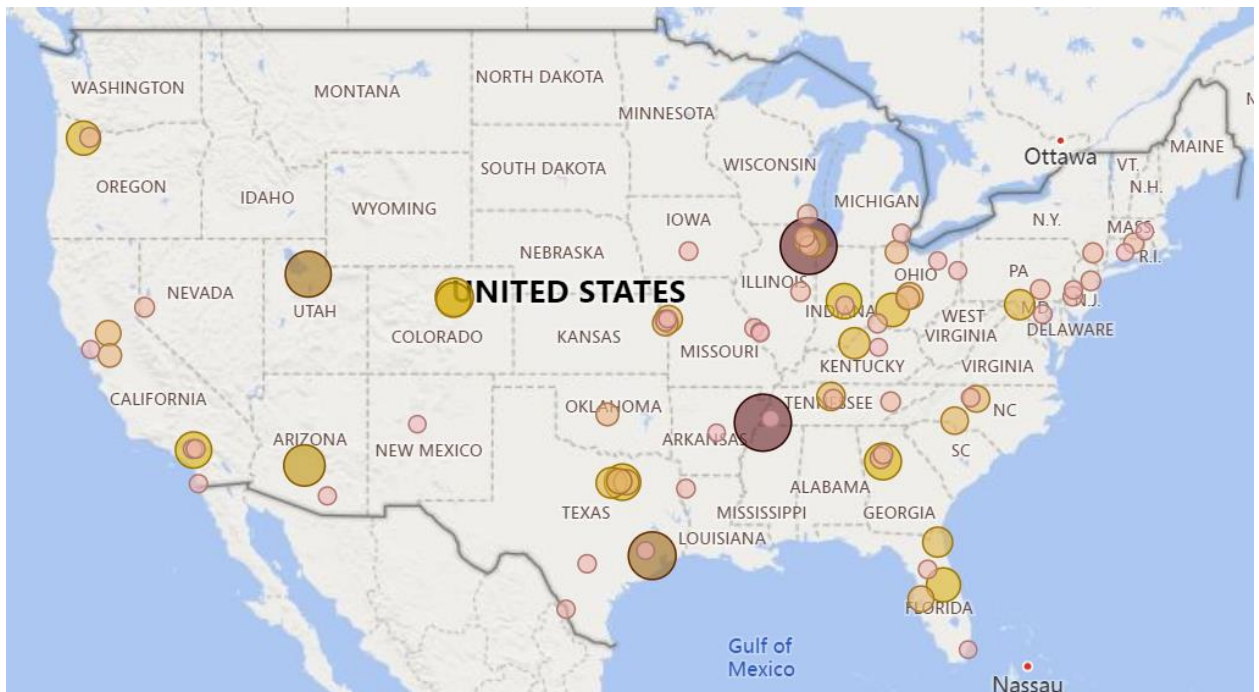
Each year, approximately 15,000–22,000 incidents involving hazardous materials are reported to OHMS.⁴² While these incidents occur across all 50 states, they primarily occur in major metropolitan areas or hubs of commerce.

Figure 3.3 below shows a map of the cities and states where hazmat incidents tend to occur in the U.S.⁴³ Figure 3.3.1 is a bar plot of the U.S. cities with the greatest number of hazmat incidents. From FY 2019-2020, the greatest number of hazmat incidents occurred in Memphis, TN (832); Hodgkins, IL (827); and Houston, TX (663). These three cities have remained in the top three since 2015.

⁴² PHMSA Hazmat Incident Database (approximating the range of counts for unique Report Numbers, including each fiscal year from 2011 to 2020)

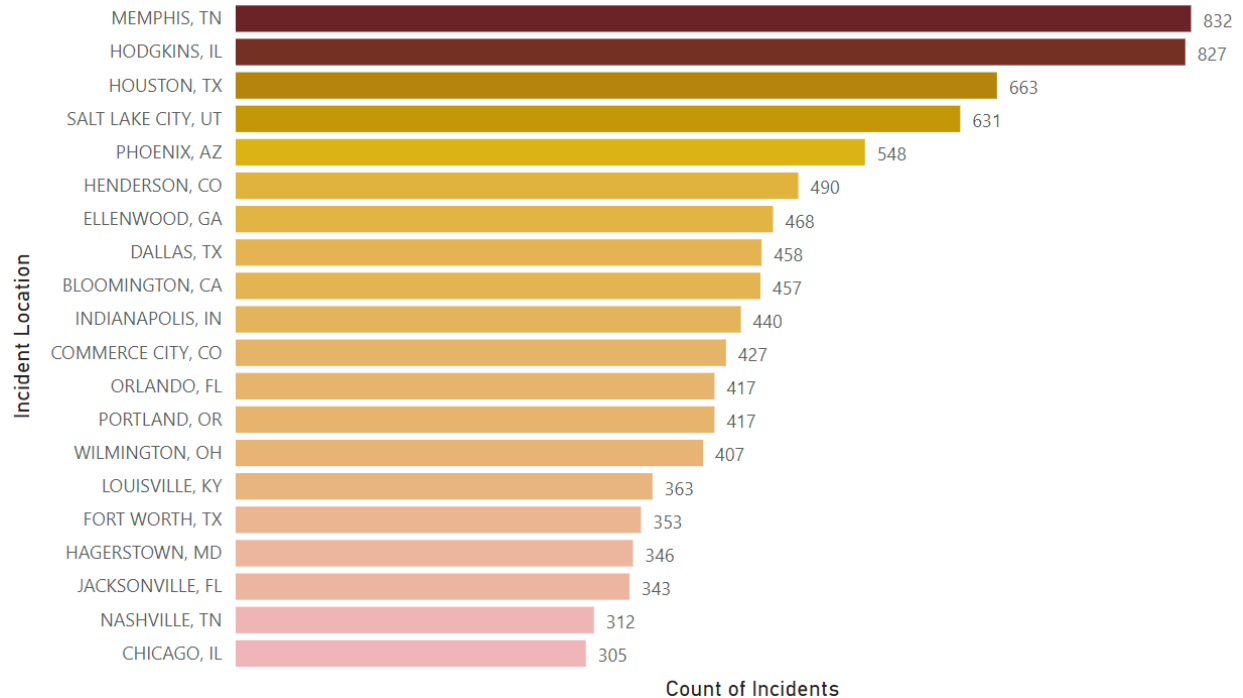
⁴³ PHMSA Hazmat Incident Database (aggregating the unique Report Numbers for each combination of INCIDENT_CITY and INCIDENT_STATE)

Figure 3.3: Map of incident counts by City and State (FY 2019-2020)^[1]



[1] The figure only displays the continental U.S. For example, the state of Alaska is not displayed. Anchorage, Alaska was the location for 132 hazmat incidents over FY 2019-2020.

Figure 3.3.1: U.S. cities with the greatest number of hazmat incidents (FY 2019-2020)

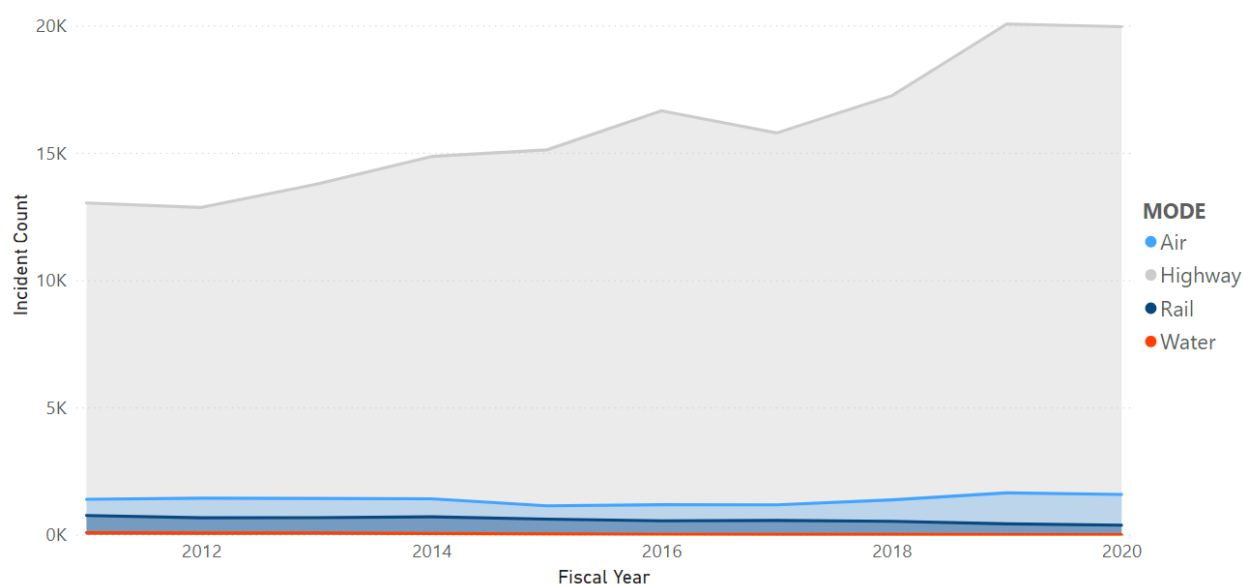


3.4 Hazmat Incidents Differentiated by Mode of Transportation

Figure 3.4 shows that the modal distribution of incidents did not materially change from 2011-2020.⁴⁴ The highway mode of transportation comprises by far the greatest number of incidents, whereas the water mode comprises the least. In fact, water incidents – represented by the red-orange line – tend to be so few each year that they are only barely visible in Figure 3.4 relative to the annual totals for air, highway, and rail incidents, respectively.

However, the figure suggests an increase in incidents overall over 2011-2020. This report does not investigate this finding but emphasizes there could be several factors influencing the number of annual hazmat incidents reported to PHMSA, possibly unrelated to any organic increase in incident rates over time. Please also see section 3.7 of this report.

Figure 3.4: Annual number of hazmat incidents by mode of transportation (FY 2011-2020)



3.5 Incident Data and Emerging Hazmat Risks

Using the incident data, PHMSA has identified emerging hazmat risks related to the transportation of lithium-ion batteries. Figure 3.5 demonstrates the substantial increase in the number of lithium battery incidents over the reporting period (FY 2019-2020) relative to preceding years.

Over the past decade, use of lithium batteries has continued to grow. For this reason, PHMSA, FAA, and the Office of the Secretary of Transportation created the Lithium Battery Air Safety Advisory Committee to reduce these safety risks.⁴⁵ Specifically, Section 333(d) of the FAA Reauthorization Act of 2018 mandated the Secretary of Transportation to establish this federal advisory committee, composed of representatives of the Federal government as well as

⁴⁴ PHMSA Hazmat Incident Database (counting unique report numbers by MODE_OF_TRANSPORTATION for each fiscal year from 2011-2020).

⁴⁵ PHMSA website. Lithium Battery Air Safety Advisory Committee.

<https://www.phmsa.dot.gov/hazmat/rulemakings/lithium-battery-air-safety-advisory-committee>

representatives of lithium battery and product manufacturing industries, air carriers, and shippers, among other industries.⁴⁶

OHMS has worked to address these risks by revising lithium battery regulations in the HMR through rulemakings, including Harmonization with International Standards (HM-215O)⁴⁷ and Enhanced Safety Provisions for Lithium Batteries Transported by Aircraft (HM-224I), also required under the FAA Reauthorization Act of 2018.⁴⁸ The HM-215O final rule was published May 11, 2020, and HM-224I's interim final rule was published March 6, 2019.

In addition, Section 333(c) of the FAA Reauthorization Act of 2018 instructed PHMSA to form a working group comprised of representatives with expertise in lithium battery safety, product safety, and standards development. Multiple federal agencies participated in the working group, including FAA, the National Highway Traffic Safety Administration (NHTSA), the U.S. Consumer Product Safety Commission (CPSC), the Food and Drug Administration's Center for Tobacco Products (FDA-CTP) and Center for Devices and Radiological Health (FDA-CDRH), and the National Institute of Standards and Technology (NIST). The working group found that while the regulatory approach to risk management provides a robust system for safety, it does not fully address the unique issues specific to rapidly evolving technologies like lithium batteries.

To address this gap, the working group identified four focus areas to positively impact lithium battery safety. They include the adoption of safety audit programs to assess the operational management and quality control procedures of lithium batteries during design and manufacture; the establishment of a comprehensive systems' approach to product safety through manufacturing practices; increased coordination and communication amongst Working Group members, with broadened efforts to work collaboratively for information exchange across federal agencies; and continued participation in the development and use of consensus standards to address safety throughout a product's lifecycle, including transportation and end-of-life state.

With respect to lithium batteries' end-of-life state, PHMSA has also convened federal agency partners to address damaged, defective, or recalled (DDR) lithium batteries, as well as lithium battery recycling. PHMSA hosts this DDR working group on a biweekly basis, covering efforts to improve the safety of DDR lithium batteries through regulations and guidance, public outreach, enforcement and compliance, and investments in Research, Development, and Technology (RD&T). For example, the DDR working group released the Safety Advisory Notice for the Transportation of Lithium Batteries for Disposal or Recycling,⁴⁹ drafted a new photo-based guide for how to identify and properly transport DDR lithium batteries (publication

⁴⁶ FAA Reauthorization Act of 2018. Public Law 115-254. <https://www.congress.gov/115/bills/hr302/BILLS-115hr302enr.pdf>

⁴⁷ Hazardous Materials: Harmonization with International Standards Final Rule. 85 FR 27810. RIN: 2137-AF32. Docket ID: PHMSA-2017-0108. May 11, 2020. <https://www.federalregister.gov/documents/2020/05/11/2020-06205/hazardous-materials-harmonization-with-international-standards>

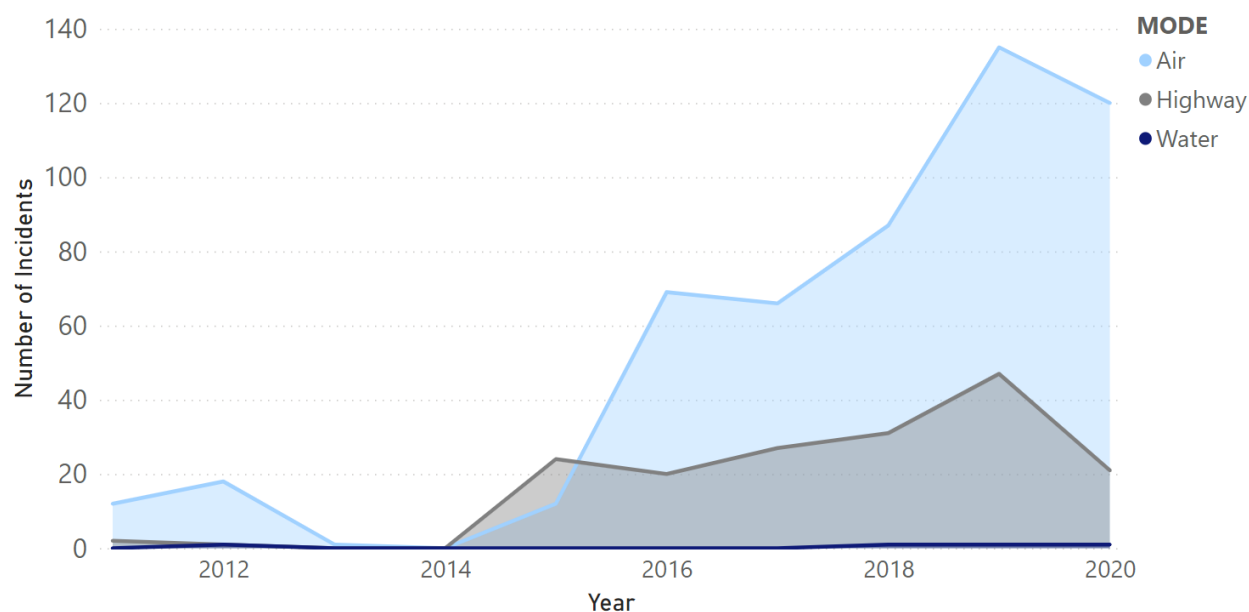
⁴⁸ PHMSA. Hazardous Materials: Enhanced Safety Provisions for Lithium Batteries Transported by Aircraft. Docket ID: PHMSA-2016-0014. May 6, 2019. <https://www.regulations.gov/document/PHMSA-2016-0014-0008>

⁴⁹ U.S. DOT, PHMSA. Safety Advisory Notice for the Transportation of Lithium Batteries for Disposal or Recycling. Issued Date: Tuesday, May 17, 2022. <https://www.phmsa.dot.gov/training/hazmat/safety-advisory-notice-transportation-lithium-batteries-disposal-or-recycling>

forthcoming), and developed messaging on social media in conjunction with federal partners such as the U.S. Environmental Protection Agency (EPA) and FAA. The DDR working group also engaged with companies involved in the manufacturing of micromobility devices (e.g., e-bikes, electric scooters) as well as groups involved in repairing or recycling lithium batteries used in micromobility. RD&T efforts advanced new technologies aimed at improving the safety, efficiency, and consistent packaging and disposal of lithium batteries, including de-energizing materials and methods to significantly reduce lithium batteries' state-of-charge and a prototype for a Battery Logistics Integrated Safety System (BLISS) to extinguish lithium batteries in the event they undergo thermal runaway and pose a risk of fire, explosion, or dangerous off-gassing.

These concerted efforts to address the risks of transporting lithium batteries reflect an awareness that lithium battery incidents in transportation have grown, especially in the air mode. Using DOT Form 5800.1 data, Figure 3.5 shows the count of incidents by year and mode for UN 3481, lithium-ion batteries contained in or packed in equipment. The rail mode of transportation is not listed in the legend because there are no reported rail incidents involving UN 3481.

Figure 3.5 Incident count by year and mode for UN 3481



Other emerging risks include the possible future transport of LNG by rail. Historically, the HMR prohibited the transport of LNG by rail in tank cars, but there was also a lack of demand and business opportunity to justify doing so.⁵⁰ Instead, rail transport of LNG has only been permitted on an ad hoc basis as authorized by the conditions of a PHMSA special permit (49 CFR § 107.105) or in a portable tank secured to a rail car pursuant to the conditions of an FRA approval. With very limited instances of LNG transported by rail, there have been no incidents involving LNG transported by rail reported to PHMSA.⁵¹ Yet, in the case of LNG transported by

⁵⁰ Hazardous Materials: Liquefied Natural Gas by Rail. Docket No. PHMSA-2018-0025 (HM-264). July 24, 2020. <https://www.federalregister.gov/documents/2020/07/24/2020-13604/hazardous-materials-liquefied-natural-gas-by-rail>

⁵¹ PHMSA Hazmat Incident Database (query including "Rail" for mode_of_transportation and "1972" for identification_number).

rail, PHMSA identified this emerging risk based on a 2017 application⁵² for a special permit to transport LNG by rail and a 2017 petition for rulemaking, requesting that two specific types of the DOT-113 specification tank car be authorized as a bulk packaging for transporting LNG by rail.⁵³

In December 2019, PHMSA issued a special permit authorizing Energy Transport Solutions, LLC to transport methane, refrigerated liquid (e.g., LNG) by rail tank car.⁵⁴ In July 2020, PHMSA published a final rule, in coordination with FRA, to authorize the transportation of LNG by rail in DOT-113C120W specification rail tank cars with enhanced outer tank requirements, subject to all applicable requirements and certain additional operational controls.⁵⁵ The final rule is the subject of pending litigation in the U.S. Court of Appeals for the D.C. Circuit.⁵⁶ In November 2021, PHMSA and Federal Railroad Administration (FRA) proposed to suspend this authorization, pending the completion of a separate rulemaking evaluating potential modifications to the requirements governing rail tank car transportation of LNG, or June 30, 2024, whichever occurs earlier.⁵⁷ PHMSA continues to research and evaluate this emerging risk in collaboration with FRA and a committee of external technical experts at the Transportation Research Board (TRB) of the National Academies of Sciences, Engineering, and Medicine (NASEM), which has reviewed several of the Department's plans and activities with respect to the safety of LNG by rail and issued a preliminary (Phase 1) report in June 2021 and final (Phase 2) report in September 2022.⁵⁸

Another emerging risk involves investigating the structural integrity of nurse tanks. Current hazmat regulations allow cargo tanks to operate indefinitely if periodic inspection and requalification are met through 49 CFR Part 180. Nurse tanks, a subset of cargo tanks, are exempt from 49 CFR Part 180 if they meet specification from the American Society of Mechanical Engineers (ASME) code and commodity limitation requirements. Given this exception and the lack of a defined service life, the performance of nurse tanks has been questioned. In addition, there have been incidents where nurse tanks have failed and caused significant hazmat releases to the environment and affected public safety, causing evacuations,

⁵² PHMSA. Hazardous Materials: Issuance of Special Permit Regarding Liquefied Natural Gas. Dec. 11, 2019. Document ID: PHMSA-2018-0025-0081. <https://www.regulations.gov/document/PHMSA-2018-0025-0081>

⁵³ Petition for rulemaking, P-1697. Association of American Railroads. Docket ID: PHMSA-2017-0020. <https://www.regulations.gov/docket/PHMSA-2017-0020>

⁵⁴ DOT-SP 20534. Dec. 5, 2019. Document ID: PHMSA-2019-0100-3006. <https://www.regulations.gov/document/PHMSA-2019-0100-3006>

⁵⁵ PHMSA. Hazardous Materials: Liquefied Natural Gas by Rail. July 24, 2020. Document ID: PHMSA-2018-0025-0480. <https://www.regulations.gov/document/PHMSA-2018-0025-0480>

⁵⁶ See *Sierra Club, et al. v. USDOT, et al.*, Nos. 20-1317, 20-1318, 20-1431, & 21-1009 (D.C. Cir.) and U.S. DOT. DOT Litigation News. LNG by Rail Rule the Subject of Multiple Legal Challenges; Cases Held in Abeyance. Spring 2021 DOT Litigation News. May 4, 2021. <https://www.transportation.gov/sites/dot.gov/files/2021-12/Spring%202021%20DOT%20Litigation%20News.pdf>

⁵⁷ PHMSA. Hazardous Materials: Suspension of Hazardous Materials Regulations Amendments Authorizing Transportation of Liquefied Natural Gas by Rail. November 8, 2021. Document ID: PHMSA-2021-0058-0002. <https://www.regulations.gov/document/PHMSA-2021-0058-0002>

⁵⁸ NASEM. TRB. Safe Transportation of Liquefied Natural Gas by Railroad Tank Car. <https://www.nationalacademies.org/our-work/safe-transportation-of-liquefied-natural-gas-by-railroad-tank-car>

injuries, and at least one fatality.⁵⁹ However, information on nurse tank performance is limited because current regulations exempt nurse tanks from hydrostatic tests at test pressure during periodic intervals, and no cyclic tests are required for these tanks. OHMS is currently working with the DOT Volpe Center to develop testing procedures for nurse tanks and analyze fatigue life. Federal Motor Carrier Safety Administration (FMCSA) has also made nurse tanks the subject of dedicated research.⁶⁰

3.6 Top Consequence Hazardous Materials and the Normalized Hazard Rating

In addition to emerging hazmat risks, PHMSA has also identified the hazardous materials that are linked to the most serious consequences in terms of deaths and major injuries relative to exposure. OHMS periodically reviews the incident data to explore, develop, and refine methodologies and analyses that illustrate which hazardous materials are most likely to be involved in death and major injury relative to exposure, such as how much is transported and how far the materials are transported (i.e., ton-miles).

Similar (but not identical) reporting, which covers the periods of 2005-2009, 2010-2014, and 2015-2018, is available on the PHMSA website.^{61,62} PHMSA updates this reporting to include incident data from 2019 and 2020, with an overall timeframe of analysis covering fiscal years, 2011-2020, a 10-year period. As such, this report is different from previous reporting, which used four- or five-year intervals (e.g., 2010-2014, 2015-2018) and calendar years. This change represents an improvement, as a longer timeframe of analysis may be relatively less susceptible to outliers, and fiscal year reporting aligns with the presentation of incident data in other sections of this report (i.e., Figure 3.2). The specific methodology presented here has limitations, but it provides one potential indicator for identifying “top consequence” hazardous materials.

This indicator is called the “normalized hazard rating,” and is calculated in a few steps. First, calculate the product of 0.266 and the total number of major injuries for each hazardous material. DOT’s 2021 guidance on the economic Value of a Statistical Life (VSL) uses a coefficient of 0.266 for the injury class of “Severe” within the Maximum Abbreviated Injury Scale (MAIS), so 0.266 is used to weight the severity of major injuries downward relative to the severity of deaths, which has a coefficient of 1.⁶³ Second, add this product to the total number of deaths for each hazardous material. Third, to normalize by exposure, divide the resulting sum by U.S. Census

⁵⁹ NTSB. Nurse Tank Failure With Release of Hazardous Materials Near Calamus, Iowa. April 15, 2003. <https://www.nts.gov/investigations/AccidentReports/Reports/HZM0401.pdf>

⁶⁰ FMCSA. 2018-07-01. Testing and Recommended Practices to Improve Nurse Tank Safety, Phase III: Research Brief. [Testing and Recommended Practices to Improve Nurse Tank Safety, Phase III: Research Brief \(bts.gov\)](#)

⁶¹ PHMSA. Report to Congress - Biennial Report on the Transportation of Hazardous Materials: Years 2015-2016 and 2017-2018. January 2021. <https://www.phmsa.dot.gov/news/report-congress-biennial-report-transportation-hazardous-materials-years-2015-2016-and-2017>

⁶² PHMSA. OHMS. Reports and Research. Top Consequence Reports. <https://www.phmsa.dot.gov/hazmat-program-management-data-and-statistics/risk-and-regulatory-analysis/reports-and-research>

⁶³ U.S. Department of Transportation. “Departmental Guidance Treatment of the Value of Preventing Fatalities and Injuries in Preparing Economic Analyses March 2021.” April 4, 2021. <https://www.transportation.gov/office-policy/transportation-policy/revised-departmental-guidance-on-valuation-of-a-statistical-life-in-economic-analysis>

Commodity Flow Survey (CFS) estimates for millions of ton-miles transported.⁶⁴ Lastly, multiply by 10,000 as a neutral way to change the scale of the normalized hazard rating. Please note, the normalized hazard rating is not an index where figures are relative to 1, 10, 100 or some other index baseline.

Limitations of this methodology are expressed in the 2017 report, “Top Consequence Hazardous Materials by Commodities & Failure Modes, 2010-2014,” and they also apply here.⁶⁵ These limitations include:

- The formula used to weight “major injuries” assumes that major injuries are 26.6% of the severity of a death, based on the MAIS coefficient for “severe” injuries, per DOT policy. Different weighting systems could produce different results.
- Ranking hazmat commodities may give a false impression that the commodity itself is a causal factor for a death or major injury in a given incident. Incident data are self-reported by the entity in physical possession of the hazmat when the incident occurs, and in some cases, may be misreported.⁶⁶ In particular, incident reporting does not indicate that a root cause analysis was conducted.
- The rankings do not incorporate factors that readily indicate risks to the environment; these rankings focus on safety risks as expressed by the prevalence of incidents involving death and major injury.
- The Commodity Flow Survey (CFS) data used to normalize the hazmat incident data do not cover all the commodities involved in incidents. Notably, the CFS excluded estimates for commodities that did not meet U.S. Census publication standards. When a certain commodity lacks estimates in the CFS, OHMS excludes that commodity from being ranked.
- OHMS excludes commodities for which CFS estimates of ton-miles round to zero.
- As a judgment call, this 2011-2020 ranking excludes commodities that fall below the 10th percentile of the distribution of the CFS estimation for million ton-miles.
- A 10-year period of analysis is an improvement over previous reporting, which presented results over four- or five-year periods, but 10 years is still “short.” The 10-year period may be susceptible to outliers and the overrepresentation of low-probability, high-consequence events from the incident record.

Because of these considerations, PHMSA urges stakeholders to exercise care in interpreting the results. In particular, PHMSA cautions against equating a commodity’s ranking with safety risk; a commodity’s ranking may not be indicative of the extent of the risks associated with transporting that commodity. Further, the commodity is just one of many factors to be considered as influencing the occurrence or severity of an incident. PHMSA also cautions against using the rankings as a driver for policy or business decisions.

⁶⁴ U.S. Census Bureau. Hazardous Materials Series: HazMat Shipment Characteristics by UN/NA Number for the United States: 2017. Table ID: CF1700H03. <https://data.census.gov/>

⁶⁵ PHMSA. OHMS. Top Consequence Report (2010-2014). <https://www.phmsa.dot.gov/hazmat-program-development/risk-and-regulatory-analysis/top-consequence-report-2010-2014>

⁶⁶ 49 CFR § 171.16 Detailed hazardous materials incident reports, paragraph (a).

In the table below, OHMS presents the hazardous materials with the 15 highest, normalized hazard ratings over the fiscal years, 2011-2020, sorted in descending order. Higher ratings suggest greater potential for death and major injury consequences relative to other hazardous materials with lower ratings. Conversely, higher ratings may simply indicate the hazardous materials that were involved in an incident with death or major injury despite relatively low exposure (fewer ton-miles) in transportation.

Table 3.6 – Top consequence hazardous materials (sorted by Normalized Hazard Rating)

UN ID	Proper Shipping Name (abbreviated)	Fatalities	Major Injuries	HIC^[1]	Ton-Miles (millions)^[2]	Hazard Rating^[3]
1266	Perfumery products with flammable solvents	2	0	2.0	143.0	139.9
2922	Corrosive liquids, toxic, n.o.s.	0	7	1.9	363.0	51.3
1075	Petroleum gases, liquefied	8	43	19.4	5773.0	33.7
2672	Ammonia solution...not more than 35% ammonia	1	4	2.1	648.0	31.9
1814	Potassium hydroxide, solution	2	3	2.8	1171.5	23.9
1791	Hypochlorite solutions	0	9	2.4	1331.5	18.0
2810	Toxic, liquids, organic, n.o.s...	0	1	0.3	152.0	17.5
1005	Ammonia, anhydrous	4	10	6.7	4322.5	15.4
2014	Hydrogen peroxide, aqueous solutions ...	0	4	1.1	721.0	14.8
1270	Petroleum oil	1	0	1.0	928.5	10.8
2693	Bisulfites, aqueous solutions, n.o.s.	0	2	0.5	520.0	10.2
1017	Chlorine	0	5	1.3	1396.0	9.5
1830	Sulfuric acid with more than 51% acid	1	21	6.6	7264.5	9.1
3267	Corrosive liquid, basic, organic, n.o.s.	0	1	0.3	295.5	9.0
1203	Gasoline ... with not more than 10% alcohol	58	26	64.9	72358.5	9.0

[1] High impact casualties (HIC): Fatalities + (0.266 x Major Injuries)

[2] The figure for ton-miles is an average of 2012 and 2017 CFS estimates.

[3] (HIC / million ton-miles) x 10,000

3.7 Hazmat Incidents by Year and Month

Figure 3.7 shows the total number of hazardous material incidents by year, suggesting a moderate upward trend. This report does not investigate this finding but offers that among the possible trend factors are growing economic activity, such as e-commerce, and greater engagement of the transportation industry in reporting incident data to PHMSA.

Following Figure 3.7, Figure 3.7.1 shows the number of incidents differentiated by month, indicating “seasonality,” or generally when incidents occurred. The historical data show that summer months tend to have higher numbers of incidents. In Figure 3.7.1, the months on the x-axis are coded numerically. For example, the value of “2” on the x-axis represents the month of February.

Figure 3.7 Total number of incidents by year (FY 2011-2020)

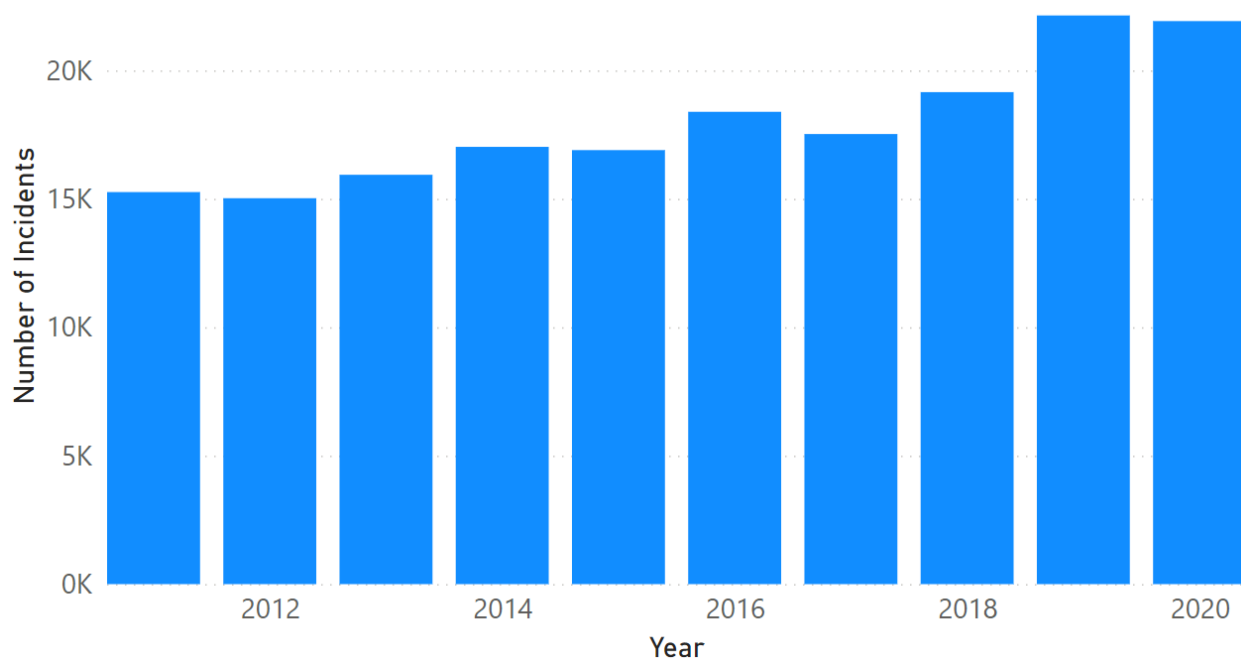
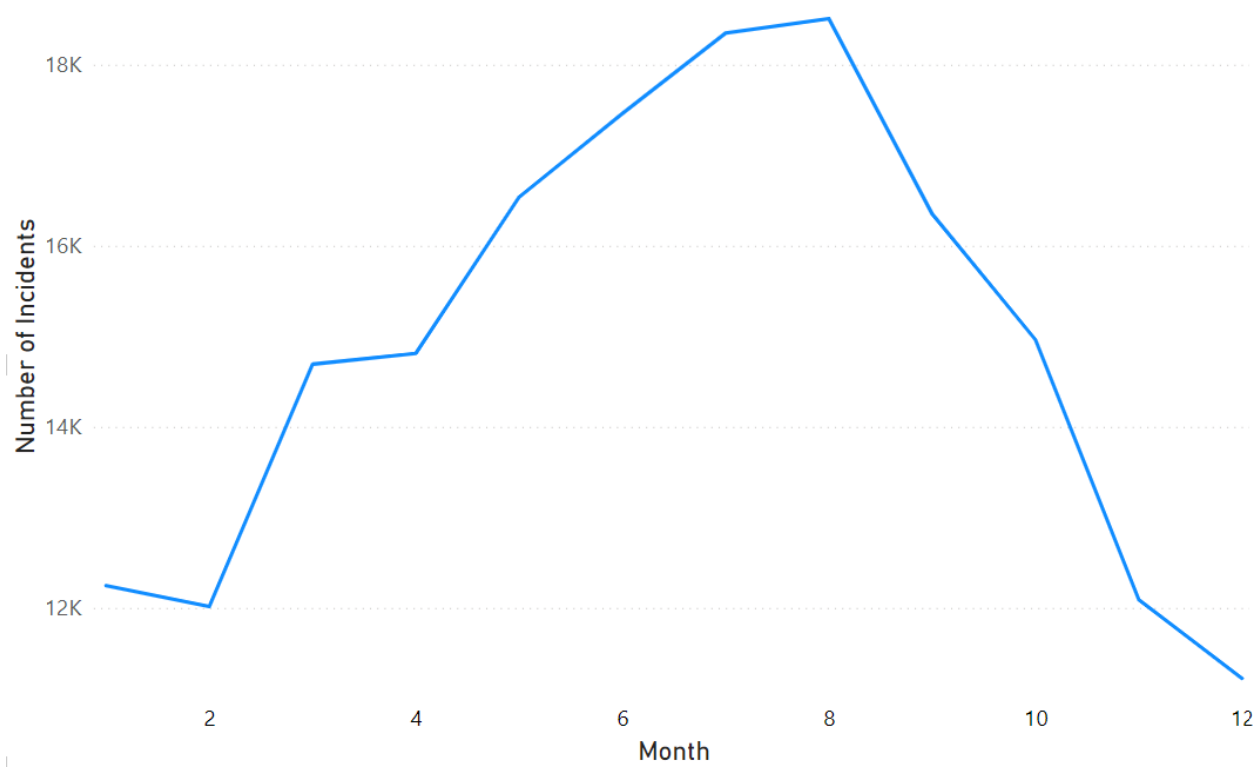


Figure 3.7.1 Hazmat incidents by month; "seasonality" (FY 2011-2020)



4. Hazardous Materials Regulations, Criteria, Orders, and Special Permit Summary

4.1 Overview of PHMSA's Hazmat Regulatory Program (2019-2020)

From 2019-2020, different legislation shaped PHMSA's hazmat regulatory program. In 2019 and 2020, PHMSA's hazmat regulatory program focused efforts on continuing to address congressional mandates, such as the FAA Reauthorization Act of 2018⁶⁷ and the FAST Act of 2015.⁶⁸

In addition to congressional mandates, PHMSA also promulgated regulations in response to safety recommendations from the National Transportation Safety Board (NTSB); the "conversion" of long-standing special permits into the HMR; streamlining and harmonizing regulations based on regulatory reform and international standards; and addressing emerging safety risks, such as the increased transportation of energy products and lithium batteries. PHMSA also evaluated requests for new or amended regulations received from stakeholders through petition for rulemakings in accordance with the 49 CFR §§ 106.95 and 106.100.

Further, PHMSA works closely with the Office of the Secretary of Transportation to ensure that PHMSA's regulatory program complies with the Administrative Procedure Act⁶⁹ and Departmental rulemaking requirements, such as DOT Order 2100.6A.⁷⁰

A comprehensive list of proposed and final rules published from 2019-2020 can be found in Appendix B of this document. As background, a list of NTSB safety recommendations issued in 2019-2020 can be found in Appendix C.

4.2 Executive Orders

In 2019 and 2020, different Executive Orders (EOs) had an impact on OHMS regulations, operations, and initiatives. For example, EO 13868—Promoting Energy Infrastructure and Economic Growth (April 10, 2019) directed the Secretary of Transportation to finalize rulemaking to allow the transportation of liquefied natural gas (LNG) by rail, which led to the publication of proposed and final rules on this issue in 2019 and 2020, respectively (this rulemaking is discussed above in section 3.5).⁷¹

In addition, Executive Order 13924—Regulatory Relief To Support Economic Recovery (May 19, 2020) directed Federal agencies to respond to the economic harm caused by the novel coronavirus (COVID-19) by reviewing their regulations and rescinding or modifying those

⁶⁷ FAA Reauthorization Act of 2018. Public Law 115-254. <https://www.congress.gov/115/bills/hr302/BILLS-115hr302enr.pdf>

⁶⁸ The Fixing America's Surface Transportation (FAST) Act of 2015. <https://www.phmsa.dot.gov/legislative-mandates/fixing-americas-surface-transportation-fast-act>

⁶⁹ Administrative Procedure Act (5 U.S.C. Subchapter II). <https://www.archives.gov/federal-register/laws/administrative-procedure>

⁷⁰ U.S. DOT Order 2100.6A. Rulemaking and Guidance Procedures. June 7, 2021. <https://www.transportation.gov/sites/dot.gov/files/2021-06/DOT-2100.6A-Rulemaking-and-Guidance-%28003%29.pdf>

⁷¹ Executive Order 13868—Promoting Energy Infrastructure and Economic Growth. April 10, 2019. <https://www.govinfo.gov/content/pkg/DCPD-201900217/pdf/DCPD-201900217.pdf>

regulations to reduce regulatory burdens.⁷² In alignment with the wider Federal response to the COVID-19 pandemic and this EO, OHMS issued emergency special permits,⁷³ safety advisories, and notices of enforcement discretion,⁷⁴ which were necessary to help prevent the spread of COVID-19 and assist response and remediation efforts associated with the emergency.

For example, OHMS issued special permits to authorize the transport of dry ice by air to support vaccine delivery and made temporary exceptions to the HMR to support the transportation of ethanol-based hand sanitizers. OHMS also issued safety advisories and guidance to inform the regulated community about COVID-19 diagnostic samples so that they are properly marked and packaged in transportation. In addition, OHMS exercised enforcement discretion with respect to recurrent training requirements, the periodic requalification testing of cylinders and packaging designs, and the renewal of certain approvals. These efforts required coordination and collaboration across OHMS programs and the regulated community and provided regulatory relief given the exigent demands of responding to the COVID-19 public health emergency.

4.3 Special Permits

A special permit sets forth alternative requirements, or variances, to the requirements in the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180). Federal hazardous materials transportation law (Federal hazmat law; 49 U.S.C. 5101 et seq.) authorizes the U.S. Department of Transportation (DOT) to issue such variances in a way that achieves a safety level that is at least equal to the safety level required under Federal hazmat law or is consistent with the public interest if a required safety level does not exist. PHMSA's procedures for applying for a special permit are set forth in 49 CFR, Part 107, Subpart B. The Special Permits program also aims to ensure that holders of special permits are "fit" to conduct the activity allowed under the special permit. Fitness criteria are found in Appendix A to Part 107 of the HMR.

Each successful application for a special permit contains all information required in 49 CFR § 107.105, including the legal basis under 49 CFR § 107.105(d).

As summarized above and required by 49 CFR § 107.105(d), all special permits are granted on one of the following bases:

- The special permit provides a level of safety at least equal to that required by regulation; or
- If a required safety level does not exist, issuing a special permit is consistent with the public interest.

A comprehensive list of special permits issued in 2019-2020 can be found in Appendix A of this document. For each special permit, PHMSA maintains a public record of the permit, along with

⁷² Executive Order 13924—Regulatory Relief to Support Economic Recovery. May 19, 2020.

<https://www.federalregister.gov/documents/2020/05/22/2020-11301/regulatory-relief-to-support-economic-recovery>

⁷³ PHMSA. PHMSA COVID-19 Emergency Special Permits. <https://www.phmsa.dot.gov/news/phmsa-covid-19-emergency-special-permits>

⁷⁴ PHMSA. PHMSA Assistance to the Public During COVID-19. <https://www.phmsa.dot.gov/news/assistance-public-during-covid-19>

any required mitigations or other conditions of transport on its web site.⁷⁵ Further, as every special permit is based on a public record that begins with publication regarding the prospective special permit holder, additional information can be obtained using PHMSA's applications portal.⁷⁶

While Appendix A briefly explains the basis for each special permit, a full examination of the special permit conditions and supporting materials may be necessary to fully understand how PHMSA was able to make a determination regarding safety. 49 U.S.C. 5117 requires that, to issue a special permit, the safety level of transportation under the special permit will be at least equal to the safety level required by Federal hazmat law, or consistent with public interest and with Federal hazmat law if a required safety level does not exist.

⁷⁵ PHMSA. Hazardous Materials Special Permits Search Page. <https://www.phmsa.dot.gov/approvals-and-permits/hazmat/special-permits-search>

⁷⁶ PHMSA. PHMSA Portal Access Page. <https://portal.phmsa.dot.gov/>

5. An Evaluation of the Effectiveness of Enforcement Activities and the Degree of Voluntary Compliance

5.1 Overview

This section highlights enforcement and compliance activities relating to a function regulated by the Secretary under the Federal hazmat law 49 USC § 5103(b)(1) and the degree of compliance with the HMR. PHMSA works closely with FAA, FMCSA, FRA, and USCG to extend enforcement capabilities and reach, as well as to engage in outreach with various stakeholders and regulated entities.

In this section, OHMS provides an overview of PHMSA investigation and inspection results, such as tickets and warning or advisory letters. In the following sections OHMS provides a summary of enforcement actions from FAA, FMCSA, FRA, and USCG.

In this report, PHMSA does not present enforcement data comparatively due to differences that discourage direct comparisons, such as different terminology, authorities, and practices in enforcement programs across PHMSA, FAA, FMCSA, FRA, and USCG. Nevertheless, the greatest number of inspections and violations found were in highway mode due to the inclusion of hazmat inspections conducted by thousands of enforcement officers under the Motor Carrier Safety Assistance Program (MCSAP).⁷⁷

The following table presents an overview of PHMSA investigation and inspection results, including warning letters,⁷⁸ notices of probable violation (NOPVs),⁷⁹ and tickets.⁸⁰

Table 5.1: PHMSA Enforcement Numbers (2019-2020)

Year	Investigations or Inspections	Warning Letters	NOPVs	Tickets
2019	2,140	269	125	354
2020	1,676	244	154	264

⁷⁷ FMCSA. MCSAP Grant. <https://www.fmcsa.dot.gov/grants/mcsap-basic-incentive-grant/motor-carrier-safety-assistance-program-mcsap-grant>

⁷⁸ 49 CFR § 107.309 Warning letters.

⁷⁹ 49 CFR § 107.311 Notice of probable violation.

⁸⁰ For an alleged violation that does not have a direct or substantial impact on safety, the Associate Administrator may issue a ticket. See 49 CFR § 107.310 Ticketing.

5.2 Federal Aviation Administration (FAA) Enforcement Summary

FAA uses risk-based approaches to support the oversight of both air carriers and shippers of hazmat. These approaches include the development and implementation of a certificate-based safety management system for oversight of air carriers to identify systemic problems and ensure that air carriers resolve them. For oversight of air shippers, FAA has developed a risk-based, pre-inspection module to effectively screen hazmat shippers and identify high-risk inspectional targets, while continuing to use the PHMSA Data Mart for Hazardous Materials and other data sources to develop inspection leads.

FAA publishes a quarterly compilation of the enforcement actions against regulated aviation entities that are closed with either a civil penalty or issuance of a certificate suspension or revocation.⁸¹ This compilation is based on data from the FAA Enforcement Information System. For purposes of this reporting, a regulated aviation entity is one that holds a certificate issued by the FAA (e.g., air carrier operating certificate, repair station certificate, pilot school certificate, airport operating certificate) or is a foreign air carrier or other aviation entity regulated under Part 129 of the Federal Aviation Regulations (14 CFR Part 129).

Please note, hazmat safety is only one component of FAA's broader enforcement authorities. PHMSA uses FAA's quarterly reports and sums the number of quarterly penalty actions and amounts across quarters to calculate the annual number of actions and sanction amounts for each year in the reporting period. However, these actions do not necessarily involve enforcement of hazmat safety regulations.

Table 5.2: FAA Enforcement Numbers (2019-2020)

Year	Penalty Actions	Sanction Amount
2019	101	\$1,862,357
2020	121	\$3,394,213

⁸¹ FAA. Enforcement Reports.

[https://www.faa.gov/about/office org/headquarters offices/agc/practice areas/enforcement/reports](https://www.faa.gov/about/office_org/headquarters_offices/agc/practice_areas/enforcement/reports)

5.3 Federal Motor Carrier Safety Administration (FMCSA) Enforcement Summary

FMCSA utilizes both Federal and state partners to carry out the agency’s hazmat enforcement program. Motor Carrier Safety Assistance Program (MCSAP) inspectors conduct roadside inspections on commercial motor vehicles and drivers to check that they are compliant with the Federal Motor Carrier Safety Regulations (FMCSRs) and HMR. From 2019 to 2020, MCSAP inspectors conducted roughly 360,000 roadside inspections related to hazmat.

The table below provides the number of roadside inspections,⁸² violations,⁸³ out-of-service violations,⁸⁴ and enforcement cases⁸⁵ related to hazmat in fiscal years, 2019-2020. The data was compiled from FMCSA's Motor Carrier Management Information System and FMCSA’s Enforcement Management Information System.

Table 5.3: FMCSA Hazmat Enforcement Numbers (FY 2019-2020)

Year	Inspections	Violations	Out-of-Service Violations	Enforcement Cases
2019	206,415	47,068	12,126	179
2020	154,298	34,075	9,399	97

⁸² FMCSA. Hazardous Materials - Roadside Inspections By Level.

<https://ai.fmcsa.dot.gov/HazmatStat/hmRoadside.aspx?rpt=RIBL> (Data snapshot as of 11/25/22)

⁸³ FMCSA. Roadside Inspections, HazMat Violations. [A&I online - Motor Carrier Analysis and Information Resources Online \(dot.gov\)](#) (Data snapshot as of 11/25/22)

⁸⁴ Ibid.

⁸⁵ FMCSA. Summary of Closed Enforcement Cases: National Results. [A&I online - Motor Carrier Analysis and Information Resources Online \(dot.gov\)](#) [Addition of the number of hazardous materials (HM) cases for the categories of “HM Carrier”, “HM Carrier (not placarded)”, “HM Carrier/Shipper”, and “HM Carrier/Shipper (not placarded)”] (Data snapshot as of 11/25/22)

5.4 Federal Railroad Administration (FRA) Enforcement Summary

FRA's Hazardous Materials Division administers a safety program that oversees the movement of hazardous materials throughout the Nation's rail transportation system. The Office of Railroad Safety promotes and regulates safety throughout the railroad industry. The office executes its regulatory and inspection responsibilities through a diverse staff of railroad safety experts.

FRA compiles an annual civil penalty report summarizing civil penalty claims for violations of Federal railroad safety and hazardous materials statutes and regulations. FRA's annual report also includes: a summary of rail safety and hazmat compliance inspections and audits that FRA or State inspectors conducted, and the enforcement actions FRA recommended; a summary of FRA civil penalty enforcement actions sorted by type of alleged violation and type of respondent, including railroads, hazmat shippers, contractors, and individuals; a discussion of the relationship between inspections and enforcement actions, the number and rate of reportable accidents and incidents, and railroad safety; an analysis of locomotive engineer certification cases brought before FRA; and a list of civil penalty cases FRA closed.

Based on the FRA annual civil penalty report, the following table presents FRA inspections in fiscal years, 2019⁸⁶ and 2020.⁸⁷ It also presents the number of hazmat violations recommended by FRA inspectors and the number of cases and violations with civil penalties initially assessed for hazmat shippers.

Table 5.4: FRA Enforcement Numbers (FY 2019-2020)

Year	Inspections	Recommended Violations (Hazmat)	Hazmat Shippers	
			Number of cases with civil penalties	Number of violations with civil penalties
2019	74,202	2,490	783	1,178
2020	77,771	3,211	472	515

⁸⁶ FRA. Fiscal Year 2019 Enforcement Report. Document Series: Annual Enforcement Report. <https://railroads.dot.gov/elibrary/fiscal-year-2019-enforcement-report>

⁸⁷ FRA. Fiscal Year 2020 Enforcement Report. Document Series: Annual Enforcement Report. <https://railroads.dot.gov/elibrary/fiscal-year-2020-enforcement-report>

5.5 United States Coast Guard (USCG) Enforcement Summary

The USCG inspects cargo and containers for compliance with the Federal Hazardous Materials Transportation Law, 49 U.S.C. 5101-5127, and the International Safe Container Act of 1977 (ISCA), 46 U.S.C. 80501-80509. Regulations implementing the ISCA can be found in 49 CFR 450-453.

Additionally, USCG inspects containers of general cargo to ensure hazardous materials are not being shipped illegally, i.e., without hazard communication. This is generally referred to as “undeclared” hazardous materials. Undeclared hazardous material shipments are a leading cause of transportation incidents. In addition, all containers are inspected for structural serviceability.

Further, the USCG manages the National Response Center (NRC). The NRC is the main federal point of contact for reporting oil and chemical spill incidents.⁸⁸ Many of these incidents involve hazardous materials, and some also classify as reportable to OHMS under 49 CFR § 171.16.

The USCG publishes a Domestic Annual Report. The report summarizes the statistics and information regarding inspections and enforcement of regulations on U.S. flagged vessels. Included in the report are deficiency and detention rates for each type of inspected domestic vessel, as well as performance metrics for Recognized Organizations that perform work on the U.S. Coast Guard’s behalf. The USCG Marine Information Safety and Law Enforcement (MISLE) database stores data on the number of inspections conducted and deficiencies issued for the respective calendar years.

The table below shows the number of USCG inspections and deficiencies for the years, 2019⁸⁹ and 2020.⁹⁰

Table 5.5: USCG Enforcement Numbers (2019-2020)

Year	Inspections	Deficiencies
2019	21,471	31,738
2020	18,414	27,087

⁸⁸ USCG National Response Center (NRC). NRC Home. [USCG National Response Center Home Page](#)

⁸⁹ Department of Homeland Security (DHS), USCG. Flag State Control in the United States: 2019 Domestic Annual Report. <https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/CG-5PC/CG-CVC/CVC1/AnnualRpt/2019DomesticAnnualReport.pdf>

⁹⁰ DHS, USCG. Flag State Control in the United States: 2020 Domestic Annual Report. <https://www.dco.uscg.mil/Portals/9/DCO%20Documents/5p/CG-5PC/CG-CVC/CVC1/AnnualRpt/2020%20Flag%20State%20Control%20Annual%20Report.pdf?ver=KjllvJcwgB2bafzy6H KgCw%3d%3d>

5.6 Facilitating Voluntary Compliance with the Regulations

PHMSA engages in a voluntary systems integrity approach to work collaboratively with the regulated community. The Systems Integrity Safety Program (SISP) provides and facilitates in-depth analyses, observations, and cooperative engagement to identify the root causes of transportation safety concerns. SISP is designed to collaborate with industry and stakeholders to achieve compliance by identifying systems failures, contributing key factors, and implementing systems to control risk and improve safety. PHMSA enters into an agreement with participants to accurately assess their hazmat operations and develop a cooperative safety plan.⁹¹

Eligible entities include, but are not limited to, companies with more than three separate civil enforcement case actions or more than five separate enforcement actions (e.g., cases, tickets, warning letters), or are identified through adverse safety trends such as an order to perform a safety recall of DOT or UN specification packaging.⁹²

SISP participants in 2019 and 2020 include Univar/Nexeo Solutions, EMD Millipore, CKS Packaging, and Buckley Oil Company.⁹³ At the end of 2020, five agreements were closed while two remained opened. Additionally, PHMSA had four invitations to speak with companies that have not yet committed to the program.

⁹¹ Systems Integrity Safety Program (SISP). SISP Agreement Template. [Systems Integrity Safety Program \(SISP\) | PHMSA \(dot.gov\)](#)

⁹² Ibid.

⁹³ These companies' names are provided for informational purposes only and their inclusion in the report is not an endorsement.

6. Summary of Outstanding Problems in PHMSA's Safety Program

6.1 Overview

In accordance with 49 U.S.C. § 5121(h)(5), this section summarizes outstanding problems in carrying out PHMSA's hazardous materials safety program.

6.2 Collection and Availability of Hazardous Materials Data

OHMS strives to be an organization that makes risk-based and data-driven decisions and continuously improves in that regard. Data is used strategically to propel program priorities, detect emerging risks, target prevention activities, and evaluate the effectiveness of programs and projects.

However, PHMSA faces limitations surrounding the timeliness, accuracy, and availability of data regarding hazardous materials transportation. For example, data on the commodity flow of hazardous materials are often considered proprietary or security sensitive, and may not be available to PHMSA, or may not be available until the data is collected in official surveys, processed, aggregated, and published, a process which can require multiple years.

In addition, incident data collected in PHMSA's 5800.1 form is self-reported by the entity in physical possession of the hazardous materials at the time of the incident and may at times be misreported or incompletely reported. These data limitations affect the capacity to properly characterize the dynamics of hazmat transportation risk in space and time; to anticipate emerging risks and prepare for those risks; and to define a level of acceptable risk for planning and regulatory purposes.

To address these challenges, OHMS is working towards revising the Hazardous Materials Incident Report form through requests for public comment as part of the OMB review process for information collection.⁹⁴ In addition, OHMS has developed an initial survey for a hazmat-specific supplement to the U.S. Census / U.S. DOT Bureau of Transportation Statistics (BTS) Commodity Flow Survey (CFS).⁹⁵ The supplement is expected to survey new hazmat packaging information and be conducted on an annual basis, rather than reporting just once every five years.

⁹⁴ Office of Information and Regulatory Affairs, OMB, Executive Office of the President. Information Collection Review FAQ. https://www.reginfo.gov/public/jsp/Utilities/faq.myjsp#icr_info

⁹⁵ U.S. Census Bureau. Commodity Flow Survey (CFS). <https://www.census.gov/programs-surveys/cfs.html>

7. Recommendations for Appropriate Legislation

PHMSA's mission is to protect people and the environment by advancing the safe transportation of energy and other hazardous materials that are essential to our daily lives. To do this, the agency establishes national policy, sets and enforces standards, educates the regulated community and public, and conducts research to prevent incidents. We also prepare the public and first responders to respond to hazmat incidents and reduce consequences if an incident does occur.

In planning current efforts and the agency's future, OHMS has identified the following priorities:

- Strengthen safety rules
- Improve data transparency and access;
- Understand and pilot emerging technologies;
- Build community connections;
- Integrate new employees and further develop existing employees through training and growth programs;
- Revive and revitalize third-party programs;
- Build a robust safety program; and
- Leverage our partners.

To strengthen safety rules, OHMS is updating its High Hazard Flammable Train (HHFT) rule, working closely with the NTSB on investigating incidents and responding to safety recommendations, and continuing to provide advance notice on safety issues via safety bulletins. PHMSA has worked closely with the FRA and the Secretary of Transportation on a rail safety action plan that includes items that the railroad industry can undertake immediately, items the Department will continue to advance, and a number of items that Congress can do to strengthen rail and hazardous materials safety:

1. Increasing the maximum fines that DOT can issue to rail companies for violating safety regulations. The current maximum fine, even for an egregious violation involving hazard materials and resulting in fatalities, is \$225,455. This is a rounding error for a company that reported an astonishing record annual operating income in 2022 of \$4.8 billion and has posted operating margins approaching 40%.
2. Following through on new bipartisan support to expand and strengthen rules governing high-hazardous shipments, including HHFTs, pushing past industry opposition.
3. Following through on new bipartisan support to modernize braking regulations and increase the use of electronically controlled pneumatic brakes.
4. Speeding up the phase-in of safer (DOT 117) tank cars to carry hazardous materials. Congress established a phase-in schedule under the 2015 FAST Act which gives owners of tank cars until 2029 to fully adopt stronger (DOT 117) tank cars. The original 2015 HHFT Rule required the phase-in by 2025. Congress can act now to speed, rather than slow, this important safety measure.
5. Increasing funding to expand hazardous materials training for first responders.

To improve data transparency and access, OHMS is researching new Key Performance Indicators (KPIs) related to safety, equity, and sustainability. For example, OHMS is working to finalize the Real Time Train Consist Information Rulemaking—to improve access to emergency response personnel to railroad incidents. OHMS is also tracking the number of outreach activities conducted by the OHMS Community Liaisons team, especially activities directed towards underserved communities, and reporting as a KPI the number of hazmat incidents that result in a road closure of one hour or more to improve emergency response and reduce transportation system disruption. OHMS is also working towards measuring and tracking the percent of R&D funding used for new sustainable energy or directed to small businesses as defined by the Small Business Administration.

With respect to piloting emerging technologies, OHMS prioritizes its role in regulating the transportation of vital space components and assessing the feasibility of incorporating regulations into the HMR that will reduce the number and complexity of permits necessary to support space operations. In the area of new lithium battery technology, OHMS is advancing R&D projects to improve the safe transport of damaged, defective, and recalled lithium batteries, and those collected and transported for recycling. These technologies include de-energizing materials and methods to significantly reduce lithium batteries' state-of-charge, the use of aerogels in lithium battery packaging, new packaging systems to contain fires resulting from lithium battery thermal runaway, and viable alternative battery types that may be safer in some applications than lithium batteries, such as sodium ion batteries.

To build community connections, OHMS prioritizes new recruitment and hiring to expand its team of Community Liaisons (CLs), which comprises at least two CLs in each of the five OHMS regions within Field Operations along with a Field Outreach Coordinator reporting to the Deputy Associate Administrator for Field Operations. CLs and other OHMS staff will develop new measurements and tools to evaluate the impact of OHMS outreach, especially to underserved communities in line with Administration goals for equity such as EO 13985 and the Justice40 initiative.

In the area of professional training and growth, the integration and engagement of new employees will focus on providing unique opportunities to engage with outside stakeholders and PHMSA personnel across the organization. There are opportunities for on-site educational visits to logistics and fulfillment centers and the PHMSA Training Center in Oklahoma City, OK, as well as teambuilding or “homecoming” events to strengthen working relationships between staff at DOT headquarters and those working remotely or at regional field offices.

To revitalize third-party programs, OHMS prioritizes increased engagement of Independent Inspection Agencies (IIAs),⁹⁶ Fireworks Certification Agencies (FCAs),⁹⁷ and packaging testing laboratories.⁹⁸ PHMSA provides oversight of these third parties, which assist in the process of

⁹⁶ U.S. DOT, PHMSA. Independent Inspection Agencies Information. <https://www.phmsa.dot.gov/hazmat/pressure-vessels-approvals/independent-inspection-agencies-information>

⁹⁷ U.S. DOT, PHMSA. Firework Certification Agencies (FCA). <https://www.phmsa.dot.gov/hazmat/energetic-materials-approvals/firework-certification-agencies-fca>

⁹⁸ U.S. DOT, PHMSA. Third-Party Packaging Test Labs. <https://www.phmsa.dot.gov/hazmat/general-approvals/third-party-packaging-test-labs>

certifying compliance with the HMR for cylinder manufacturing, requalification, and repair; consumer fireworks classification; and UN specification packaging testing, respectively. OHMS has established a working group to better define the roles, responsibilities, and expectations of these third parties at a more detailed level than provided in existing third-party approval documents. This includes expectations for fitness evaluations, which are a condition of OHMS' approval of third parties. As part of this process, OHMS aims to increase communications with the participants of third-party programs and assign key points of contact for each participant. As a result, OHMS will bolster relationships with third-party program participants and enhance the performance of the essential duties shared between OHMS and the regulated community to ensure the safety and integrity of hazmat packaging.

Building a robust safety program spans all OHMS program areas, but also requires identifying priority goals and projects. For example, OHMS prioritizes updating the Standard Operating Procedure (SOP) on responses to NTSB safety recommendations, as well as converting historical letters of interpretation applicable to the HMR into broadly applicable frequently asked questions (FAQs) on its website.⁹⁹ OHMS will also seek and review public comments on a new fee structure for the hazmat registration program in response to a potential increase in grant funding set forth in the Infrastructure Investment and Jobs Act,¹⁰⁰ also known as the Bipartisan Infrastructure Law. If the registration fees are increased through rulemaking, the additional collection of fees will increase the funds available for emergency response grants and training.

With respect to leveraging our partners, OHMS has prioritized improving the evaluation of special permits and general approvals that require multi-modal approval, i.e., the review of different modal administrations at U.S. DOT or the USCG. This effort will focus on modernizing the Operational Workflow document used in this interagency review of special permits and approvals. In addition, OHMS prioritizes its partnership with states and state agencies, in particular through the expansion of the Hazardous Materials State Inspection (HMSI) grant, which enables states to conduct hazmat shipper inspections in cooperation with PHMSA. Further, OHMS aims to increase the number of impressions and downloads of PHMSA messages, resources, and products available online, to include the Check the Box campaign for users of the U.S. Postal Service and commercial mail carriers, the ERG for hazmat technicians and emergency responders, and the Retester Identification Number (RIN) locator for cylinder requalifiers and end-users.

PHMSA recommends legislation that furthers these priorities and helps the agency serve its mission.

⁹⁹ U.S. DOT, PHMSA. Notice and Request for Comments: FAQs – Applicability of the Hazardous Materials Regulations. March 22, 2022. <https://www.phmsa.dot.gov/news/notice-and-request-comments-faqs-applicability-hazardous-materials-regulations>

¹⁰⁰ H.R. 3684 – Infrastructure Investment and Jobs Act.

Appendix A: Comprehensive List of Special Permits (New issuance; 2019-2020)¹⁰¹

SP Number	Company Name	Disposition Date	Disposition Status	Application Type	Summary
21166	FEDERAL CARTRIDGE COMPANY	12/29/2020	Granted	New	To authorize the transportation in commerce of six primer caps that were previously approved with lead styphnate as the primer explosive to be transported with a proprietary explosive formulation that replaces the lead styphnate.
21151	TOYOTA GAZOO RACING EUROPE GMBH	12/23/2020	Granted	New	To authorize the transportation in commerce of prototype lithium batteries in support of the Toyota Racing Team at the World Endurance Championship.
21087	ISTANBUL GENLESME VE HIDROFOR TANKLARI MAKINE SANAYI VE TICARET ANONIM SIRKETI	12/18/2020	Granted	New	To authorize the manufacture, mark, sale and use of non-DOT specification water pump system tanks charged with a compressed gas that vary from the required size specified in 173.306(g).
21146	APM TERMINALS PACIFIC LLC	12/17/2020	Granted	New	To authorize hazmat employers, who employ maritime transportation workers and are unable to provide recurrent training consistent with the HMR due to restrictions resulting from the COVID-19 public health emergency, to delay the recurrent training for the applicable hazmat employees.
21128	DEPARTMENT OF DEFENSE US ARMY MILITARY SURFACE DEPLOYMENT & DISTRIBUTION COMMAND	12/17/2020	Granted	New	To authorize a one-time 5-year extension to the 10-year requalification date identified on FIBA ISO trailers with UN11120 cylinders.
21106	GENERAL MOTORS LLC	12/14/2020	Granted	New	To authorize the transportation in commerce of lithium ion cells in Large Packaging by highway and rail.
21056	CUMMINS INC.	12/11/2020	Granted	New	To authorize the transportation in commerce of prototype lithium batteries by cargo-only aircraft.
21158	UPS SUPPLY CHAIN SOLUTIONS, INC.	12/10/2020	Granted	New	To authorize the transportation in commerce of dry ice by air in accordance with 173.217(d) when the dry ice has previously been used to refrigerate diagnostic or treatment specimens.

¹⁰¹ Data extract from the PHMSA Data Mart for Hazardous Materials. Accessed November 30, 2022. Query includes *Application Type* is equal to “New” or “Reconsideration”; *Disposition* is equal to “Granted” or “Partially Denied”; and *Disposition Date* is between 01/01/2019 and 12/31/2020, <https://portal.phmsa.dot.gov>. See also the Hazardous Materials Special Permits Search Page, <https://www.phmsa.dot.gov/approvals-and-permits/hazmat/special-permits-search>

21110	NORFOLK SOUTHERN RAILWAY COMPANY	12/4/2020	Granted	New	To authorize the use of electronic means to maintain and communicate on-board train consist information in lieu of paper documentation when hazardous materials are transported by rail.
21057	SPACEFLIGHT, INC.	12/4/2020	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries contained in equipment (spacecraft).
21059	UNION PACIFIC RAILROAD COMPANY INC	11/25/2020	Granted	New	To authorize the use of electronic means to maintain and communicate on-board train consist information in lieu of paper documentation when hazardous materials are transported by rail.
21085	OMRON ROBOTICS AND SAFETY TECHNOLOGIES, INC.	11/25/2020	Granted	New	To authorize the transportation in commerce of certain lithium batteries in alternative packaging and exceeding 35 kg aboard cargo-only aircraft.
21063	COBHAM MISSION SYSTEMS ORCHARD PARK INC.	11/25/2020	Granted	New	To authorize the transportation in commerce of certain gases in non-refillable, non-DOT specification cylinders.
21067	STAINLESS TANK & EQUIPMENT CO., LLC	11/25/2020	Granted	New	To authorize the manufacture, mark, sale, and use of DOT 400 series cargo tanks fabricated using certain stainless steels and other materials not authorized as materials of construction by § 178.345-2.
21138	LG CHEM, LTD.	11/23/2020	Granted	New	To authorize the transportation in commerce aboard motor vehicle of defective lithium-ion batteries in 4G fiberboard outer boxes that were used to transport replacement batteries.
21104	KELLEY FUELS, INC.	11/20/2020	Granted	New	To authorize the transportation in commerce of cargo tanks containing either gasoline or diesel fuel with a placard permanently marked with a "1203" UN number identification mark.
21084	SAMSUNG SDI AMERICA, INC.	11/17/2020	Granted	New	To authorize the transportation in commerce of lithium batteries in excess of 35 kg by cargo-only aircraft.
21014	VOLVO CARS OF NORTH AMERICA, LLC	11/10/2020	Granted	New	To authorize the transportation in commerce of lithium-ion batteries exceeding 35 kg net weight by cargo-only aircraft.
21131	DEPARTMENT OF DEFENSE US ARMY MILITARY SURFACE DEPLOYMENT & DISTRIBUTION COMMAND	11/9/2020	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries that have not passed the required tests in the UN Manual of Tests and Criteria.

21130	TATONDUK OUTFITTERS LIMITED	11/6/2020	Granted	New	To authorize the acceptance and transportation in commerce of hazardous materials to be used for zero-gravity research experiments conducted aboard the aircraft during parabolic flight operations from the point of origin airport to the return of the aircraft to that same airport.
21132	NORTHWEST ENERGETIC SERVICES LLC	11/5/2020	Granted	New	To authorize the transportation in commerce of bags of explosives which are marked with an incorrect EX number.
21099	STAGEFX, INC.	10/21/2020	Granted	New	To authorize the use of the 2018 APA Standard 87-1C: Standard for the Construction, Classification, Approval, and Transportation of Entertainment Industry and Technical (EI&T) Pyrotechnics for classification of pyrotechnic materials.
21049	FERRELLGAS, L.P.	10/9/2020	Granted	New	To authorize the transportation in commerce of 2,338 filled cylinders that had not been requalified before the requalification became due.
21101	UNITED STATES AVIATION CO	10/8/2020	Granted	New	To authorize the transportation in commerce of hazardous materials by helicopter in amounts that exceed the maximum net quantity in the HMR.
21093	ORBITAL SCIENCES LLC	10/8/2020	Granted	New	To authorize the transportation in commerce of the low production lithium metal battery identified as Model No.9ER20P-20B, manufactured by Orion HIT, which are specifically designed for space flight, as Class 9 without passing UN T.6 - Impact Test.
21094	UMBRA LAB, INC.	10/7/2020	Granted	New	To authorize the transportation of prototype lithium batteries contained in equipment (spacecraft).
21072	ISOTEK SYSTEMS, LLC	10/7/2020	Granted	New	To authorize the transportation in commerce of radioactive material in alternative packaging.
21074	ZHEJIANG MEENYU CAN INDUSTRY CO., LTD.	10/7/2020	Granted	New	To authorize the manufacture, mark, sale, and use of a non-refillable, non-DOT specification inside metal container similar to a DOT specification 2Q.
21119	SPACEFLIGHT, INC.	10/6/2020	Granted	New	To authorize the transportation in commerce of spacecraft containing hazardous materials.

21095	SUTERRA LLC	10/5/2020	Granted	New	To authorize the transportation in commerce of limited quantities of aerosols for which the completed package exceeds 66 lbs gross weight.
21123	GENERAL DEFENSE CORP	10/2/2020	Granted	New	To authorize the transportation in commerce of certain Class 1 materials that are forbidden for air transportation by cargo-only aircraft.
21117	SPACEFLIGHT, INC.	10/1/2020	Granted	New	To authorize the transportation in commerce of low production lithium batteries contained in spacecraft.
21122	ENVIRONMENTAL PROTECTION AGENCY	9/30/2020	Granted	New	To authorize the transportation in commerce of hazardous materials in support of the recovery and relief operations from and within California fire disaster areas under conditions that may not meet the Hazardous Materials Regulations (HMR).
21124	ENVIRONMENTAL PROTECTION AGENCY	9/30/2020	Granted	New	To authorize the transportation in commerce of hazardous materials in support of the recovery and relief operations from and within Oregon fire disaster areas under conditions that may not meet the Hazardous Materials Regulations (HMR).
21079	KOREAN AIRLINES CO., LTD	9/29/2020	Granted	New	To authorize the transportation in commerce of certain explosives which are forbidden for transport by cargo only aircraft.
21107	WALMART INC.	9/17/2020	Granted	New	To authorize the transportation in commerce of ethanol-based hand sanitizer in non-bulk combination packages without certain markings.
21073	BOLLORÉ LOGISTICS GERMANY GMBH	9/17/2020	Granted	New	To authorize the transportation in commerce of certain non-DOT specification containers containing certain Division 2.1, 2.2, 2.3 liquefied and compressed gases and other hazardous materials for use in specialty cooling applications such as satellites and military aircraft.
20964	STANLEY BLACK & DECKER, INC.	9/17/2020	Granted	New	To authorize the manufacture, mark, sale, and use of lithium-ion batteries contained in an enclosure (i.e., generator) providing protection that would otherwise be achieved through packaging.

21100	K7 DESIGN GROUP LLC	9/17/2020	Granted	New	To authorize the transportation in commerce of ethyl alcohol-based hand sanitizer in non-bulk packages without proper marking.
21105	US EPA REGION 5	9/16/2020	Granted	New	To authorize the transportation in commerce of certain damaged, defected, or recalled lithium batteries and batteries of other chemistries in the same outer packaging.
21012	PRAXAIR DISTRIBUTION, INC.	9/3/2020	Granted	New	To authorize the transportation in commerce DOT 3AA cylinders that have been re-qualified using 100% UE examination in lieu of internal visual inspection and hydrostatic pressure testing as prescribed at paragraph §180.209(a). Each cylinder successfully passing requalification using 100% UE examination will have its retest interval extended to at least once every 15 years.
21055	AVL POWERTRAIN ENGINEERING, INC.	8/24/2020	Granted	New	To authorize the transportation in commerce of a single prototype lithium-ion battery. Only one shipment is authorized under the terms of this special permit.
21015	AMAZON.COM, INC.	8/19/2020	Granted	New	To authorize the transportation in commerce of materials shipped under limited quantity exceptions with a reduced size limited quantity marking.
21081	ROMEO SYSTEMS, INC.	8/13/2020	Granted	New	To authorize the transportation in commerce of lithium-ion batteries exceeding 35 kg by cargo only aircraft.
20998	DAICEL SAFETY SYSTEMS AMERICAS, INC.	8/11/2020	Partially Denied	New	To authorize the manufacture, mark, sale, and use of non-DOT specification cylinders (pressure vessels) for use as components of automobile vehicle safety systems. These pressure vessels may be charged with non-toxic, non-liquefied gases or mixtures thereof and are authorized for transportation in commerce subject to requirements and limitations specified herein.
21092	LYNDEN AIR CARGO, LLC	8/11/2020	Granted	New	To authorize the transportation in commerce of explosives forbidden aboard cargo-only aircraft.
21061	KLA CORPORATION	8/7/2020	Granted	New	To authorize the transportation in commerce of certain flammable solids in non-DOT specification packaging.

21075	AEROJET ROCKETDYNE, INC.	8/5/2020	Granted	New	To authorize the transportation in commerce of explosives between manufacturing facility and storage bunkers along approximately 5 miles of unpopulated low traffic highway without shipping papers.
21082	DEPARTMENT OF RESOURCES RECYCLING AND RECOVERY	7/30/2020	Granted	New	To authorize the transportation in commerce of certain hazardous materials in support of the recovery and relief operations from and within the fire disaster areas in California under conditions that may not meet the Hazardous Materials Regulations (HMR).
21051	LAB VENDOR, LLC	7/23/2020	Granted	New	To authorize the transportation of certain chemicals and cryogenically preserved (refrigerated and deep frozen), infectious, biological substances packaged in special packaging in a specially designed, dedicated refrigerated truck by highway.
21078	SAINT LOUIS UNIVERSITY	7/22/2020	Granted	New	To authorize the transportation in commerce of 45 freezers containing Category B Infectious Substances.
21076	ARKEMA INC.	7/21/2020	Granted	New	To authorize the transportation of a UN T11 Isotank with a faulty pressure relief device filled with Ethyl Mercaptan to a repair facility.
21070	NATIONAL AIR CARGO GROUP, INC.	7/15/2020	Granted	New	To authorize the transportation in commerce by cargo only aircraft of Class 1 explosives which are forbidden or exceed quantities presently authorized.
21022	WEBASTO ROOF & COMPONENTS SE	7/14/2020	Granted	New	To authorize the transportation in commerce of untested lithium-ion batteries that exceed 35 kg by cargo-only aircraft.
20901	SPRINGFIELD TERMINAL RAILWAY CO INC	7/14/2020	Granted	New	To authorize the storage of liquid petroleum gas (LPG) on storage tracks in serving yards close to major LPG distribution facilities.
21041	KLA CORPORATION	7/10/2020	Granted	New	To authorize the transportation in commerce of certain flammable solids in non-specification plywood boxes.
20962	PORTABLE ELECTRIC, LTD.	7/9/2020	Granted	New	To authorize the transportation in commerce by cargo only aircraft of lithium-ion batteries that exceed the maximum weight allowed.
20983	ROTH GLOBAL PLASTICS INC.	6/30/2020	Granted	New	To authorize the transportation in commerce of Division 2.2 materials in non-DOT specification cylinders (accumulators).

21018	PACKAGING AND CRATING TECHNOLOGIES, LLC	6/17/2020	Granted	New	To authorize the manufacture, mark, sale, and use of UN 4G packaging with a specially designed, fire-suppressing liner for the transportation of damaged, defective, or recalled lithium-ion cells and batteries, including those contained in or packed with equipment, without being subject to certain hazard communication requirements.
21036	TRIAD NATIONAL SECURITY, LLC	6/16/2020	Granted	New	To authorize the transportation in commerce of hazardous materials packaged in packaging that has not been closed in accordance with the manufacturer's closure instructions.
21028	NEUTRON HOLDINGS, INC.	6/15/2020	Granted	New	To authorize the manufacture, mark, sale, and use of alternative packaging for the transportation in commerce of damaged, defective, or recalled lithium-ion cells and batteries and lithium metal cells and batteries and these cells or batteries contained in or packed with equipment.
21029	U.S. CRYOGENICS, INC.	6/15/2020	Granted	New	To authorize the transportation in commerce of Dewars that have been repaired but have not been pressure tested in accordance with the specifications under which they were originally manufactured.
20986	OLIN CORPORATION	6/15/2020	Granted	New	To authorize the transportation in commerce of tank cars containing chlorine in quantities exceeding those authorized in the HMR.
20942	BETTER HORSE INC.	5/29/2020	Granted	New	To authorize the transportation in commerce of the Division 1.4S articles specified herein as limited quantities.
20996	NORFOLK SOUTHERN RAILWAY COMPANY	5/28/2020	Granted	New	To authorize the transportation in commerce of hazardous materials by rail without buffer cars between placarded cars and engines
21019	HALPERN IMPORT COMPANY	5/28/2020	Granted	New	To authorize the transportation in commerce of lighters in non-DOT specification packaging by private or contract motor carrier, or by common carrier in a motor vehicle under exclusive use, between manufacturing sites, distribution centers and retail outlets.
21024	SPACEFLIGHT, INC.	5/28/2020	Granted	New	To authorize the transportation in commerce of low production lithium batteries contained in equipment that exceed 35 kg by cargo-only aircraft.

20969	PORSCHE LOGISTIK GMBH	5/26/2020	Granted	New	To authorize the transportation in commerce of lithium batteries exceeding 35 kg by cargo-only aircraft.
21046	CSX TRANSPORTATION, INC.	5/26/2020	Granted	New	To authorize the use of electronic means to maintain and communicate onboard train consist information in place of using paper documentation when hazardous materials are transported by rail, subject to special conditions as prescribed in the special permit.
21052	SIENA PLASTICS LLC	5/16/2020	Granted	New	To authorize the manufacture, mark, sale, and use of plastic jerricans that have not passed the 28-day stack test. COVID-19 request for hand sanitizer (mode 1)
20994	SK INNOVATION CO., LTD	5/15/2020	Granted	New	To authorize the transportation in commerce of lithium-ion batteries that exceed 35 kg by cargo-only aircraft.
21042	WALMART INC.	4/27/2020	Granted	New	To authorize the transportation in commerce of 55-gallon drums containing Class 3 residue that may not be properly closed.
21031	HEXAGON LINCOLN, LLC	4/20/2020	Granted	New	To authorize the transportation of bulk natural gas in cylinders that are up to 12 months out of requalification.
20975	CSL BEHRING L.L.C.	4/17/2020	Granted	New	To authorize the transportation in commerce of regulated medical waste in UN 11G packaging.
20954	BNSF RAILWAY COMPANY	4/13/2020	Granted	New	To authorize the use of electronic means to maintain and communicate on-board train consist information in lieu of paper documentation when hazardous materials are transported by rail.
20971	PRO-DEX, INC.	4/10/2020	Granted	New	To authorize the transportation in commerce of lithium-ion batteries at a state of charge greater than 30 percent by air.
21013	RECYCLE AEROSOL, LLC	4/7/2020	Granted	New	To authorize the manufacture, mark, sale, and use of packaging for the purpose of transporting approved cigarette lighters which have been removed from their inner packaging and are being sent for disposal.
21016	LUCID MOTORS	4/1/2020	Granted	New	To authorize the transportation in commerce of lithium-ion batteries which exceed the 35 kg size limit.

21025	AIRGAS USA, LLC	4/1/2020	Granted	New	To authorize the filling and offering for transportation in commerce of certain DOT specification cylinders that are up to 12 months overdue for periodic requalification for relief efforts during the COVID-19 emergency.
21021	FEDERAL EXPRESS CORPORATION	3/29/2020	Granted	New	To authorize the transportation in commerce of certain Division 2.2 aerosols in crewmember carry-on baggage for the purpose of preventing the potential spread and contraction of COVID-19.
20932	JINGJIANG ASIAN-PACIFIC LOGISTICS EQUIPMENT CO., LTD.	3/26/2020	Granted	New	To authorize the manufacture, mark, sale, and use of portable tanks constructed to Section VIII, Division 2 of the ASME code.
20989	DGM ITALIA SRL	3/26/2020	Granted	New	To authorize the transportation in commerce of lithium-ion batteries which have not been tested.
20993	UNITED STATES DEPT OF ENERGY	3/24/2020	Granted	New	To authorize the transportation in commerce of class 7 material in alternative packaging.
20951	KALITTA AIR, L.L.C.	3/24/2020	Granted	New	To authorize the transportation in commerce of explosives forbidden for air transportation by cargo-only aircraft.
20963	LG CHEM WROCLAW ENERGY SP Z O O	3/24/2020	Granted	New	To authorization in commerce of lithium-ion batteries exceeding 35 kg by cargo-only aircraft.
21003	AIRGAS USA, LLC	3/19/2020	Granted	New	To authorize the transportation in commerce of ethylene in DOT 3T 2400 tubes that are not visually inspected before filling.
21008	ATIEVA USA, INC	3/19/2020	Granted	New	To authorize the transportation in commerce of prototype lithium battery packs by themselves and installed in equipment which exceed 35 kg.
20960	JOHNSON OUTDOORS GEAR LLC	3/19/2020	Granted	New	To authorize the use of non-DOT specification receptacles similar to the 2P specification, except as specified herein, for the transportation in commerce of Division 2.1 materials.
20534	ENERGY TRANSPORT SOLUTIONS LLC	3/13/2020	Granted	New	To authorize the transportation in commerce of methane, refrigerated liquid in DOT specification 113C120W tank cars.
21009	ATLAS AIR, INC.	3/10/2020	Granted	New	To authorize the transportation in commerce of explosives by cargo only aircraft which is forbidden in the regulations.

21004	ACTIA CORPORATION	3/6/2020	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries.
20973	OLIN WINCHESTER LLC	3/6/2020	Granted	New	To authorize the transportation in commerce of 22 caliber (or less) rim-fire cartridges packaged loose in strong outer packagings.
20937	STAUFF CORPORATION	2/14/2020	Partially Denied	New	To authorize the transportation in commerce of certain steel hydraulic accumulators containing nitrogen.
20995	ATLAS AIR, INC.	2/6/2020	Granted	New	To authorize the transportation in commerce of explosives by cargo aircraft.
20958	UNIVERSITY OF COLORADO	1/31/2020	Granted	New	To authorize the transportation in commerce of compressed air in Specification DOT 3AA cylinders, which are used to purge sensitive equipment.
20979	ATK SPACE SYSTEMS INC.	1/31/2020	Granted	New	To authorize the transportation in commerce of hazardous materials over 422 feet of public roadways without being subject to the HMR.
20952	CAPELLA SPACE CORP.	1/27/2020	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries contained in equipment by cargo-only aircraft.
20935	DAICEL SAFETY SYSTEMS AMERICAS, INC.	1/17/2020	Granted	New	To authorize the transportation in commerce of explosive articles classed as Division 1.4S, when packed in a special shipping container without being approved in accordance with 173.56.
20977	ROCKET LAB LIMITED	1/9/2020	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries contained in equipment (launch vehicle) in non-DOT specification packagings.
20896	APPLIED ENERGY SYSTEMS, INC.	1/9/2020	Granted	New	To authorize the transportation in commerce of a gas purification apparatus containing certain Division 4.2 (spontaneously combustible solids) in non-DOT specification stainless steel pressure vessels.
20949	SIGMA-ALDRICH, INC.	1/9/2020	Granted	New	To authorize the testing of UN 4G combination packagings for the transportation in commerce of hazardous materials in which the inner packagings have been used multiple times to complete the tests in §§ 178.603, 178.606, and 178.608.

20926	COLD BOX EXPRESS, INC.	1/9/2020	Granted	New	To authorize the use of certain temperature-controlled shipping containers containing lithium-ion batteries as not subject to certain shipping paper, training, and emergency response requirements.
20980	CLEAN HARBORS, INC.	12/20/2019	Granted	New	To authorize the transportation in commerce of a non-DOT specification tanker with a suspect valve.
20976	THE NATIONAL RECONNAISSANCE OFFICE	12/11/2019	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries contained in equipment (a spacecraft).
20913	TIVENI GMBH	12/4/2019	Granted	New	To authorize the transportation in commerce of prototype lithium-ion batteries by cargo-only aircraft.
20940	ORBITAL SCIENCES CORPORATION	11/22/2019	Granted	New	To authorize the transportation in commerce of low production runs of large lithium-ion batteries that have not completed the test requirements in accordance with Sub-Section 38.3 of the United Nations (UN) Manual of Tests and Criteria and that exceed the 35 kg limit for transportation by cargo aircraft.
20941	AIR SEA CONTAINERS, INC.	11/22/2019	Granted	New	To authorize the transportation in commerce of lithium-ion batteries in non-specification packaging.
20906	AKZO NOBEL FUNCTIONAL CHEMICALS LLC	11/15/2019	Partially Denied	New	To authorize the transportation in commerce of the hazardous materials identified in paragraph 6 in certain UN 1A1 drums and the reuse of those UN 1A1 drums without leakproofness testing.
20938	WORLDVU DEVELOPMENT, LLC	11/15/2019	Granted	New	To authorize the transportation in commerce of spacecraft containing hazardous materials in non-specification packaging.
20959	DEPARTMENT OF DEFENSE US ARMY MILITARY SURFACE DEPLOYMENT & DISTRIBUTION COMMAND	11/13/2019	Granted	New	To authorize the transportation of prototype and low production lithium cells and batteries in non-specification packaging (spacecraft).
20948	KOCSIS TECHNOLOGIES, INC.	11/8/2019	Granted	New	To authorize the transportation in commerce of certain steel hydraulic accumulators containing compressed nitrogen, a Division 2.2 material.
20930	EMD PERFORMANCE MATERIALS CORP.	11/7/2019	Granted	New	To authorize the transportation in commerce of certain DOT 4B cylinders used for certain liquids and solids that are retested every 10 years instead of 5.

20928	CATALYTIC INNOVATIONS, LLC.	11/7/2019	Granted	New	To authorizes the manufacture, marking, sale and use of non-DOT specification fiberboard boxes for the transportation in commerce of certain batteries without shipping papers, marking of the proper shipping name and identification number or labeling, when transported for recycling or disposal.
20900	AMETEK AMERON, LLC	10/30/2019	Granted	New	To authorize the manufacture, mark, sale, and use of non-DOT specification cylinders similar to DOT 3HT.
20953	TRIAD NATIONAL SECURITY, LLC	10/30/2019	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries contained in equipment (spacecraft) in non-specification packaging.
20858	CRYOCONCEPTS, LP	10/29/2019	Granted	New	To authorize the transportation in commerce of materials as limited quantities that are not otherwise authorized for the exception.
20910	CELLBLOCK FCS, LLC	10/25/2019	Granted	New	To authorize the manufacture, mark, sale, and use of UN 4G packaging for the transportation of damaged or defective lithium-ion cells and batteries, including cells or batteries contained in equipment, without being subject to certain hazard communication requirements.
20907	VERSUM MATERIALS, INC.	10/25/2019	Granted	New	To authorize the transportation in commerce of dichlorosilane in non-DOT specification cylinders.
20931	DEPARTMENT OF DEFENSE US ARMY MILITARY SURFACE DEPLOYMENT & DISTRIBUTION COMMAND	10/11/2019	Granted	New	To authorize the transportation in commerce of low production and prototype lithium-ion batteries in non-specification packaging (spacecraft component).
20820	UNION TANK CAR COMPANY	9/23/2019	Granted	New	To authorize the inspection and testing of tank car tanks using Alternating Current Field Measurement Technique (ACFMT non-destructive test method) in lieu of the methods in 49 CFR 180.509(e)(4).
20911	TEN-E PACKAGING SERVICES, INC.	9/23/2019	Granted	New	To authorize the testing of lighter designs using an alternative testing scheme.
20929	LG CHEM WROCLAW ENERGY SP Z O O	9/17/2019	Granted	New	To authorize the transportation of lithium batteries by air which exceed the allowable weight limit (35 kg)

20908	KTMI CO., LTD.	9/17/2019	Granted	New	To authorize the use of ASTM A537 Class 1 material to be used to manufacture Non-Pressure Manway Nozzles for tank cars conforming to DOT regulations and the Association of American Railroad's rules, standards, and recommended practices.
20934	SPACE EXPLORATION TECHNOLOGIES CORP.	9/17/2019	Granted	New	To authorize the transportation in commerce of spacecraft containing krypton, compressed in non-DOT specification cylinders.
20881	ARKEMA INC.	9/16/2019	Granted	New	To authorize the transportation in commerce of certain Class 3 hazardous materials in non-UN portable tanks.
20914	SILK WAY WEST AIRLINES, LLC	9/13/2019	Granted	New	To authorize the transportation in commerce of explosives forbidden aboard cargo-only aircraft.
20904	PISTON AUTOMOTIVE, L.L.C.	9/13/2019	Granted	New	To authorize the transportation of lithium-ion batteries exceeding 35 kg net weight by cargo-only aircraft.
20495	TK SERVICES INC.	9/12/2019	Granted	New	To authorize the transportation in commerce of certain safety devices from storage facilities to facilities engaged in recycling or other disposition of the safety devices.
20867	ADVANCED MATERIAL SYSTEMS CORPORATION	9/12/2019	Granted	New	To authorize the manufacture, marking, sale and use of an ISO Standard 11119-2 cylinder, for the transportation in commerce of oxygen.
20430	MINNESOTA COMMERCIAL RAILWAY COMPANY	9/11/2019	Granted	New	To authorize the transportation by rail of hazardous materials without the use of buffer cars.
20834	ECC CORROSION INC	9/9/2019	Granted	New	To authorizing the manufacture, marking, sale, and use of non-DOT specification, glass fiber reinforced plastic cargo tanks conforming with regulations applicable to DOT Specifications 407 and 412 for the transportation of hazardous materials in commerce.
20851	CALL2RECYCLE, INC.	8/26/2019	Granted	New	To authorize the manufacture, mark, sale, and use of certain UN Standard packagings for transporting end-of-life and/or used lithium-ion cells and batteries and lithium ion batteries contained in equipment recycling.

20835	AKZO NOBEL FUNCTIONAL CHEMICALS LLC	8/22/2019	Granted	New	To authorize the shipment of UN3394 and UN3399 metal alkyls in MC331 cargo tanks that house product inlet and discharge opening valves in a protective recessed well of the cargo tank.
20798	AMERICASE, LLC	8/22/2019	Partially Denied	New	To authorize the manufacture, mark, sale, and use of certain 4G and 4B boxes for the transportation in commerce of prototype and low production lithium-ion cells and batteries.
20898	RIVIAN AUTOMOTIVE, LLC	8/22/2019	Granted	New	To authorize the transportation in commerce of prototype and low production lithium-ion batteries and batteries contained in vehicles aboard cargo-only aircraft.
20899	CAIRE INC.	8/22/2019	Granted	New	To authorize the repair of certain DOT 4L cylinders without requiring pressure testing.
20909	SMBC RAIL SERVICES LLC	8/22/2019	Granted	New	To authorize the use of certain DOT 117 tank car tanks for the transportation in commerce of certain elevated temperature materials.
20915	ATLAS AIR, INC.	8/9/2019	Granted	New	To authorize the transportation of explosives by cargo aircraft which is forbidden in the regulations.
20876	SODASTREAM USA INC.	8/9/2019	Granted	New	To authorize the transportation in commerce of UN pressure vessels that use alternative valve standards than are required by the HMR.
20922	BURGWEDEL BIOTECH GMBH	8/7/2019	Granted	New	To authorize the transportation in commerce of certain biohazard materials in amounts exceeding the amount authorized by the regulations.
20856	SAMSUNG SDI AMERICA, INC.	7/25/2019	Granted	New	To authorize the transportation of lithium-ion batteries exceeding 35 kg net weight via cargo-only aircraft.
20866	ARGON ST INC	7/25/2019	Granted	New	To authorize the transportation in commerce of lithium-ion batteries contained in equipment with a net weight in excess of 35 kg by cargo-only aircraft.
20875	AIR LIQUIDE ADVANCED MATERIALS INC.	7/25/2019	Granted	New	To authorize the transportation in commerce of leaking or damaged cylinders containing Division 4.2 hazardous materials in a salvage cylinder (vessel).
20865	PORSCHE LOGISTIK GMBH	7/22/2019	Granted	New	To authorize the transportation in commerce of lithium batteries exceeding 35 kg aboard cargo-only aircraft.

20853	SOLIDENERGY SYSTEMS CORP.	7/17/2019	Granted	New	To authorize the transportation in commerce of prototype and low production lithium ion and lithium metal cells that are not individually packaged in inner packagings.
20845	LITHOS ENERGY INC	7/17/2019	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries exceeding 35 kg by cargo-only aircraft.
20861	AYALYTICAL INSTRUMENTS INC	7/17/2019	Granted	New	To authorize the use of an alternate method for determining flash point for Class 3 materials.
20830	ARKEMA, INC.	7/17/2019	Granted	New	To authorize the transportation of boron trifluoride in non-DOT specification spherical pressure vessels.
20828	BATTERIES PLUS, LLC	7/11/2019	Granted	New	To authorize the transportation in commerce of batteries and lightbulbs containing mercury on the same transport vehicle without being subject to the requirements of the HMR.
20788	TRINITY TANK CAR, INC.	7/11/2019	Granted	New	To authorize the manufacture, mark, sale, and use of DOT specification tank car tanks with nozzle flanges manufactured using methods not currently identified in the Association of American Railroads (AAR) Manual of Standards and Recommended Practices, Section C-Part III, Specifications for Tank Cars, Specification M-1002, except as specified herein, for the transportation in commerce of the hazardous materials authorized by this special permit.
20893	DAIMLER AG	7/5/2019	Granted	New	To authorize the transportation in commerce of untested lithium batteries contained in a flammable liquid powered vehicle.
20838	AIR LIQUIDE ELECTRONICS U.S. LP	7/5/2019	Granted	New	To authorize filling and transportation in commerce of certain 4BW cylinders and certain DOT-SP 12531 cylinders which are dedicated to transport dichlorosilane and have been periodically requalified using alternative methods.
20850	INSITUFORM TECHNOLOGIES, LLC	7/5/2019	Granted	New	To authorize the transportation in commerce of non-DOT specification bulk packagings containing resin solutions.
20895	INNOLITH SNOOK LLC	7/1/2019	Granted	New	To authorize the transportation in commerce of lithium-ion batteries and cells in alternative packagaing.

20902	EASTERN UPPER PENINSULA TRANSPORTATION AUTHORITY	6/27/2019	Granted	New	To authorize the transportation in commerce of certain Class 1 materials in motor vehicles aboard ferry vessels, which do not have two sets of breathing apparatus.
20864	SALMON RIVER HELICOPTERS, INC.	6/26/2019	Granted	New	To authorize the transportation in commerce of certain materials forbidden for transport via passenger-carrying aircraft or cargo-only aircraft.
20816	AIR PRODUCTS AND CHEMICALS, INC.	6/26/2019	Granted	New	To authorize the manufacture, mark, sale, and use of portable tanks built to ASME Section XII specifications.
20831	CYLINDER SALES AND TESTING, LLC	6/17/2019	Granted	New	To authorize the transportation in commerce of certain hazardous materials in DOT Specification 3AL cylinders manufactured from aluminum alloy 6061-T6 that are requalified every ten years rather than every five years using 100% ultrasonic examination.
20871	CASTLE AVIATION, INC.	6/17/2019	Granted	New	To authorize the transportation in commerce of Class 7 materials with a transport index greater than that which the HMR authorizes.
20877	MEDIGREEN WASTE SERVICES LLC	6/6/2019	Granted	New	To authorize the one-time, one-way transportation of shipping containers which contain compromised packages of medical waste.
20883	DEPARTMENT OF THE ARMY (MILITARY SURFACE DEPLOYMENT & DISTRIBUTION COMMAND)	6/6/2019	Granted	New	To authorize the transportation in commerce of Argon I non-specification packaging
20885	KOREAN AIR LINES CO., LTD.	6/5/2019	Granted	New	To authorize the transportation in commerce of certain explosives that are forbidden for transportation by cargo aircraft only
20890	KALITTA AIR, L.L.C.	6/5/2019	Granted	New	To authorize the transportation in commerce of explosives by cargo aircraft.
20862	CUMMINS INC.	6/5/2019	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries exceeding 35 kg by cargo-only aircraft.
20703	PERMA-FIX ENVIRONMENTAL SERVICES, INC.	5/29/2019	Granted	New	To authorize the transportation in commerce of uranium hexafluoride in packaging not authorized in the HMR.
20839	A123 SYSTEMS LLC	5/29/2019	Granted	New	To authorize the transportation in commerce of lithium battery assemblies exceeding 35 kg aboard cargo-only aircraft.

20843	SPACEFLIGHT, INC.	5/29/2019	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries contained in spacecraft by air.
20891	ENVIRONMENTAL PROTECTION AGENCY	5/28/2019	Granted	New	To authorize the transportation in commerce of non-radioactive hazardous materials to staging areas within 200 miles of the point of origin by persons conducting operations under the direction of and under alternative safety requirements imposed by the grantee to this special permit within the Nebraska and Iowa disaster areas.
20795	JAGUAR INSTRUMENTS INC.	5/24/2019	Granted	New	To authorize the manufacture, mark, sale, and use of non-DOT specification pressure vessels.
20884	NATIONAL AIR CARGO GROUP, INC.	5/22/2019	Granted	New	To authorize the transportation of explosives by cargo aircraft.
20880	DEPARTMENT OF THE ARMY (MILITARY SURFACE DEPLOYMENT & DISTRIBUTION COMMAND)	5/22/2019	Granted	New	To authorize the emergency transportation in commerce of prototype and low production lithium-ion batteries contained in equipment.
20852	GENERAL DYNAMICS MISSION SYSTEMS, INC.	5/15/2019	Granted	New	To authorize the transportation in commerce of prototype lithium ion and lithium metal batteries contained in equipment by cargo aircraft.
20872	SAP SE	5/2/2019	Granted	New	To authorize the transportation in commerce of lithium batteries and cells in excess of 35 kg by cargo-only aircraft.
20873	PROPACK INTERNATIONAL, INC.	5/2/2019	Granted	New	To authorize the transportation in commerce certain lithium batteries with a net mass greater than 35 kg aboard cargo-only aircraft.
20814	SAFT AMERICA INC	4/18/2019	Granted	New	To authorize the transportation in commerce of certain lithium batteries with a net mass greater than 35 kg aboard cargo-only aircraft.
20799	MULTI-CHEM GROUP, LLC	4/10/2019	Granted	New	To authorize the transportation in commerce of Acrolein, stabilized in DOT 4BW240 cylinders.
20859	TOYOTA MOTOR SALES USA INC	4/4/2019	Granted	New	To authorize the transportation in commerce of airbag inflators in overpack enclosures without marking each package with the name and address of the consignor or consignee when transported domestically on aircraft

20849	COLLINS AEROSPACE	4/3/2019	Granted	New	To authorize the transportation in commerce of manifolded cylinders that do not meet the requirements of 49 CFR 173.301(g).
20847	CHART INC.	4/3/2019	Granted	New	To authorize the manufacture, marking, sale and use of DOT MC 338 cargo tanks for use in the transportation of carbon dioxide, refrigerated liquid.
20824	WORTHINGTON CYLINDER CORPORATION	4/3/2019	Granted	New	To authorize the manufacture, mark, sale, and use of non-DOT specification cylinders conforming to the DOT 39 specification, except as provided herein.
20821	SPACEFLIGHT, INC.	4/3/2019	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries contained in equipment via air transportation.
20842	STERILMED, INC.	4/3/2019	Granted	New	To authorize the transportation in commerce of packages of medical equipment as excepted from the requirements of the Hazardous Materials Regulations without including an itemized count of equipment contained within the package.
20635	FAR RESEARCH, INC.	3/27/2019	Granted	New	To authorize the transportation in commerce of 4BW cylinders used exclusively for trimethylchlorosilane to be visual inspections per CGA C-6 in lieu of periodic hydrostatic testing.
20806	JAGUAR TEXAS VALVE AND INSTRUMENTS, LLC	3/14/2019	Granted	New	To authorize the manufacture, mark, sale, and use of non-DOT specification nickel copper alloy 400 cylinders.
20829	JAPAN AEROSPACE EXPLORATION AGENCY	3/13/2019	Granted	New	To authorize the transportation in commerce of a non-DOT pressure vessel described as a JEM-Tissue Equivalent Proportional Chamber (J-TEPC) (radiation detector box).
20805	LG CHEM	3/11/2019	Granted	New	To authorize the transportation in commerce of lithium batteries exceeding 35 kg by cargo-only aircraft.
20808	INNOFOS, INC.	3/11/2019	Granted	New	To authorize the transportation in commerce of UN 1A1 drums containing polyphosphoric acid in quantities that exceed the maximum mass authorize for steel drums.

20840	YORK SPACE SYSTEMS LLC	3/7/2019	Granted	New	To authorize the transportation in commerce of prototype and low production lithium-ion batteries in a special packaging.
20837	DEPARTMENT OF THE ARMY (MILITARY SURFACE DEPLOYMENT & DISTRIBUTION COMMAND)	3/6/2019	Granted	New	To authorize the transportation in commerce of low production lithium-ion batteries contained in equipment in a special packaging aboard cargo-only aircraft.
20819	THE GREENBRIER COMPANIES	2/20/2019	Granted	New	To authorize the transportation in commerce of low hazard solid materials in DOT 117 tank cars.
20576	CYLINDER TESTING SOLUTIONS LLC	2/14/2019	Granted	New	To authorize the use of Specification DOT 3AL cylinders used for the transportation in commerce of certain compressed gases, when retested by a 100% ultrasonic examination in lieu of the internal visual and the hydrostatic retest required in 49 CFR 180.205.
20832	ECOGREEN INDUSTRIES, LLC	2/13/2019	Granted	New	To authorize the one-way transportation in commerce of certain materials in non-DOT specification cylinders to a safe site where the contents can be transferred to specification cylinders.
20706	SOUTHERN STATES, LLC	2/13/2019	Granted	New	To authorize the transportation in commerce of non-DOT specification cylinders containing compressed sulfur hexafluoride gas.
20784	CHEMTRADE PHOSPHOROUS SPECIALTIES LLC	2/13/2019	Partially Denied	New	To authorize the transportation in commerce of damaged IBCs for the purpose of cleaning, inspection, and repair.
20825	SPACE EXPLORATION TECHNOLOGIES CORP.	2/13/2019	Granted	New	To authorize the transportation in commerce of satellites containing non-DOT specification cylinder which are not marked and labeled in accordance with Part 172.
20789	FEDERAL EXPRESS CORPORATION	2/11/2019	Granted	New	To authorize the transportation in air commerce of hazardous materials by cargo aircraft installed in a Crew Rest Module (CRM).
20705	EXHAUST CENTER, INC.	2/7/2019	Granted	New	To authorize the manufacture, mark, sale, and use of non-DOT specification steel IBCs conforming to the requirements of UN31A except for capacity.
20823	ARKEMA INC.	2/7/2019	Granted	New	To authorize the transportation of drums of Methane Sulfonic Acid in drums with possibly defective valves.

20654	JOHNSON CONTROLS ADVANCED POWER SOLUTIONS, LLC	2/1/2019	Granted	New	To authorize the transportation in commerce of prototype and low production lithium-ion batteries via cargo-only aircraft.
20777	ISRAEL AEROSPACE INDUSTRIES LTD.	1/8/2019	Granted	New	To authorize the transportation in commerce of certain non-DOT specification containers containing certain Division 2.2, and 2.3 compressed gases and other hazardous materials contained in spacecraft.
16279	VEOLIA ES TECHNICAL SOLUTIONS LLC	12/16/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain Ebola contaminated medical waste for disposal.
20336	GEOTEK CORING INC	11/12/2020	Granted	Reconsideration	To authorize the transportation in commerce of methane hydrate (frozen methane gas) in non-DOT specification cylinders.
20901	SPRINGFIELD TERMINAL RAILWAY CO INC	11/12/2020	Granted	Reconsideration	To authorize the storage of liquid petroleum gas (LPG) on storage tracks in serving yards close to major LPG distribution facilities.
15347	RAYTHEON COMPANY	11/6/2020	Granted	Reconsideration	To authorize the transportation in commerce of helium in non-DOT specification packaging (cryoengines and assemblies of Maverick Missiles, Guidance Control Sections and Training Guidance Missiles containing cryoengines).
12412	CUMMINGS INVESTMENT BANKERS, INC.	9/9/2020	Granted	Reconsideration	To authorize the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
20996	NORFOLK SOUTHERN RAILWAY COMPANY	9/3/2020	Granted	Reconsideration	To authorize the transportation in commerce of hazardous materials by rail without buffer cars between placarded cars and engines
21053	COMPAGNIE DES CHEMINS DE FER NATIONAUX DU CANADA	9/3/2020	Granted	Reconsideration	To authorize the use of electronic means to maintain and communicate on-board train consist and shipping paper information in lieu of paper documentation when hazardous materials are transported by rail.
21023	TIRE SEAL, INC.	8/12/2020	Granted	Reconsideration	To authorize the manufacture, mark, sale, and use of certain non-DOT specification inner containers for the transportation in commerce of the hazardous materials authorized by this special permit.

20474	SPACE EXPLORATION TECHNOLOGIES CORP.	7/27/2020	Granted	Reconsideration	To authorize the transportation in commerce of the Dragon 2 space capsule and associated support equipment containing non-DOT specification packagings of hazardous materials.
20644	SHELL CATALYSTS & TECHNOLOGIES LP	7/21/2020	Granted	Reconsideration	To authorize the transportation in commerce of 50G large packagings containing solid environmentally hazardous substances via air.
8971	BAKER HUGHES OILFIELD OPERATIONS, INC.	6/11/2020	Granted	Reconsideration	To authorize the transportation in commerce of Bromine trifluoride in certain non-refillable, non-DOT specification cylinders of equal or greater integrity than those currently authorized.
16274	MATHESON TRI-GAS, INC.	5/28/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain Division 4.2 and 4.3 materials in specially designed packagings shipped without labels.
20947	TMK TECHNICS CORPORATION	5/1/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain DOT 3AL, cylinders that contain carbon dioxide, with alternative hazard communication. Additionally, cylinders with a gauge pressure less than 200 kPa (29.0 psig/43.8 psia) at 20 °C (68 °F) are authorized to be transported as a hazardous material under the conditions of this special permit.
15797	ALLSTATE POWER VAC, INC.	4/24/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain unapproved airbag inflators, modules, or seatbelt pretensioners by motor vehicle for disposal.
12102	ALLSTATE POWER VAC, INC.	4/24/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain unapproved Class 1 explosive materials desensitized by wetting with water, alcohol, or other suitable diluent to eliminate their explosive properties (removal of the desensitizing agent may restore the material's explosive properties).
13179	ALLSTATE POWER VAC, INC.	4/24/2020	Granted	Reconsideration	To authorize the transportation in commerce of approved cigarette lighters which have been removed from their inner packaging and are being sent for disposal.
12998	ALLSTATE POWER VAC, INC.	4/24/2020	Granted	Reconsideration	To authorize the transportation in commerce of lab packs containing materials that are not waste materials subject to the requirements specified herein.

13192	ALLSTATE POWER VAC, INC.	4/24/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain hazardous materials in lab packs and non-bulk packages and provide relief from segregation requirements and certain marking requirements subject to the packaging and safety measures prescribed herein.
8445	ALLSTATE POWER VAC, INC.	4/24/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain shipments of various liquid or solid hazardous substances and hazardous wastes packed in inside plastic, glass, earthenware, or metal containers, not exceeding one-gallon capacity, overpacked in a UN specification 1A2 or 1B2 metal drum, a UN 1G fiber drum or a UN1H2 plastic drum, not exceeding 220 liters (55-gallon) nominal capacity only for the purposes of disposal, re-packing or re-processing.
16532	ALLSTATE POWER VAC, INC.	4/24/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain damaged or defective lithium-ion cells and batteries and lithium metal cells and batteries in alternative packaging.
12412	TREATMENT TECHNOLOGY INC	4/8/2020	Granted	Reconsideration	To authorize the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
12412	BAKER HUGHES OILFIELD OPERATIONS LLC	3/25/2020	Granted	Reconsideration	To authorize the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
12412	PRODUCERS CHEMICAL COMPANY	3/24/2020	Granted	Reconsideration	To authorize the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
16320	HEXAGON DIGITAL WAVE LLC	3/10/2020	Granted	Reconsideration	To authorize the extension of the service life of certain DOT-CFFC cylinders, which are subjected to the requalification and operational controls that are defined in this special permit.

20892	NATURAL CHOICE CORPORATION	2/14/2020	Granted	Reconsideration	To authorize the transportation in commerce of DOT 3AL cylinders containing carbon dioxide with alternate hazard communication.
8451	CESARONI TECHNOLOGY INC	2/14/2020	Granted	Reconsideration	To authorize the transportation in commerce of not more than 25 grams of solid explosive or pyrotechnic material, including waste containing explosives, that has energy density not greater than that of pentaerythritol tetranitrate (PETN), as well as specific explosive article types as outlined in Section 7(e), classed as Division 1.4E, when packed in a special shipping container.
14689	ARCOSA TANK, LLC	2/14/2020	Granted	Reconsideration	To authorize the manufacture, marking, sale and use of certain MC 331 cargo tank motor vehicles that have baffle support clips welded to the inside of the cargo tank wall.
12412	WATERTECH, INCORPORATED	1/27/2020	Granted	Reconsideration	To authorize the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
20936	CO2 EXCHANGE LLC	1/27/2020	Granted	Reconsideration	To authorize the transportation in commerce of certain DOT 3AL, TC/3ALM and UN ISO 7866 cylinders that contain carbon dioxide, with alternative hazard communication.
12412	CATALYST OILFIELD SERVICES 2016, LLC	1/9/2020	Granted	Reconsideration	To authorize the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
11646	CATALYST OILFIELD SERVICES 2016, LLC	1/9/2020	Granted	Reconsideration	To authorize the discharge of certain Class 3, Division 6.1 and Class 8 and Class 9 liquids from a DOT Specification drum without removing the drum from the vehicle on which it is transported.
14576	STRUCTURAL COMPOSITES INDUSTRIES LLC	1/9/2020	Granted	Reconsideration	To authorize the manufacture, marking, sale and use of aluminum-lined carbon-fiber composite cylinders for use in transporting certain Division 2.1 and 2.2 hazardous materials.

15863	BAKER HUGHES OILFIELD OPERATIONS LLC	11/27/2019	Granted	Reconsideration	To authorize the transportation in commerce of compressed nitrogen in a Subsurface Safety Valve (SSSV), a non-DOT specification pressurized mechanical device which is not equipped with a pressure relief device.
12412	HEARTLAND IRRIGATION	11/7/2019	Granted	Reconsideration	To authorize the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
12412	INDUSTRIAL OILS UNLIMITED INC	10/30/2019	Granted	Reconsideration	To authorize the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
20798	AMERICASE, LLC	10/8/2019	Granted	Reconsideration	To authorize the manufacture, mark, sale, and use of certain 4G and 4B boxes for the transportation in commerce of prototype and low production lithium-ion cells and batteries.
14175	R & M WELDING PRODUCTS, INC.	10/2/2019	Granted	Reconsideration	To authorize a 10-year retest interval for certain DOT Specification 3A and 3AA cylinders used for the transportation in commerce of certain Division 2.1 and Division 2.2 gases in bundles of up to 24 cylinders.
16320	HEXAGON DIGITAL WAVE LLC	8/19/2019	Granted	Reconsideration	To authorize the extension of the service life of certain DOT-CFFC cylinders, which are subjected to the requalification and operational controls that are defined in this special permit.
20710	KERR CORPORATION	5/15/2019	Granted	Reconsideration	To authorize the transportation in commerce of excepted quantities in alternative packagings and greater quantities.
12412	DUBOIS CHEMICALS, INC.	4/18/2019	Granted	Reconsideration	This special permit authorizes the discharge of liquid hazardous materials from certain UN Intermediate Bulk Containers (IBCs) and DOT Specification 57 portable tanks without removing them from the vehicle on which they are transported.
20564	ACE PYRO LLC	4/4/2019	Granted	Reconsideration	To authorize the transportation in commerce of black powder with certain fireworks listed below.

20776	ELI LILLY AND COMPANY	3/13/2019	Granted	Reconsideration	To authorize the transportation in commerce of lab packs where the inner packagings must be placed in a chemically compatible liner with sufficient absorbent material to prevent the wetting of the outer packaging.
11803	CHART INC	2/4/2019	Granted	Reconsideration	To authorize the transportation in commerce of various classes of non-flammable cryogenic liquids in DOT-113A60W tank cars.
12858	THE DOW CHEMICAL COMPANY	1/31/2019	Granted	Reconsideration	To authorize the transportation in commerce of a DOT specification 105J400W tank car having a gross weight on rail of 286,000 pounds, for use in transporting Division 2.1, 2.3, Poison-Inhalation Hazard/Zone D.
12858	UNION CARBIDE CORPORATION	1/31/2019	Granted	Reconsideration	To authorize the transportation in commerce of a DOT specification 105J400W tank car having a gross weight on rail of 286,000 pounds, for use in transporting Division 2.1, 2.3, Poison-Inhalation Hazard/Zone D.

Appendix B: Comprehensive List of Rulemaking Actions Published in the Federal Register (2019-2020)¹⁰²

Date Published	Federal Register Number	Document ID	Title	Final Rule or Proposed Rule
December 28, 2020	2020-26264	PHMSA-2011-0140-0089	Hazardous Materials: DOT-Specification Cylinders; Miscellaneous Amendments	Final
December 21, 2020	2020-23353	PHMSA-2018-0082-0001	Hazardous Materials: Editorial Corrections and Clarifications	Final
November 25, 2020	2020-23712	PHMSA-2017-0120-0057	Hazardous Materials: Adoption of Miscellaneous Petitions To Reduce Regulatory Burdens	Final
October 30, 2020	2020-22483	PHMSA-2017-0083-0009	Hazardous Materials: Response to an Industry Petition To Reduce Regulatory Burden for Cylinder Requalification Requirements	Final
July 24, 2020	2020-13604	PHMSA-2018-0025-0480	Hazardous Materials: Liquefied Natural Gas by Rail	Final
May 20, 2020	2020-10377	PHMSA-2016-0077-0092	Hazardous Materials: Vapor Pressure of Unrefined Petroleum Products and Class 3 Materials	Proposed (Advanced Notice of Proposed Rulemaking; Withdrawal)
May 11, 2020	2020-06205	PHMSA-2017-0108-0039	Hazardous Materials: Harmonization with International Standards	Final
October 24, 2019	2019-22949	PHMSA-2018-0025-0002	Hazardous Materials: Liquefied Natural Gas by Rail	Proposed
August 14, 2019	2019-16675	PHMSA-2017-0120-0005	Hazardous Materials: Adoption of Miscellaneous Petitions to Reduce Regulatory Burdens	Proposed
August 6, 2019	2019-16677	PHMSA-2017-0083-0004	Hazardous Materials: Response to an Industry Petition To Reduce	Proposed

¹⁰² Compiled from www.regulations.gov, search query for “PHMSA”, filtering for Document Type = “Rule” or “Proposed Rule” and Custom Dates (Posted Date) is between 01/01/2019 and 12/31/2020.

			Regulatory Burden for Cylinder Requalification Requirements	
July 31, 2019	2019-14101	PHMSA-2013-0008-0304	Revisions to Civil Penalty Amounts	Final
March 6, 2019	2019-03812	PHMSA-2016-0014-0008	Hazardous Materials: Enhanced Safety Provisions for Lithium Batteries Transported by Aircraft	Final (Interim Final Rule)
February 28, 2019	2019-02491	PHMSA-2014-0105-0374	Hazardous Materials: Oil Spill Response Plans and Information Sharing for High-Hazard Flammable Trains	Final
February 14, 2019	2019-02293	PHMSA-2015-0272-0003	Hazardous Materials: Revisions to Hazardous Materials Grants Requirements (FAST Act)	Final

Appendix C: NTSB Recommendations (New issuance; 2019-2020)¹⁰³

Date Issued	ID	Status¹⁰⁴	Mode	Recommendation
6/8/20	A-20-031	O-UR	Aviation	Propose to the International Civil Aviation Organization to remove its special provision A88 from its Technical Instructions for the Safe Transport of Dangerous Goods by Air allowing special permits for low-production or prototype lithium-ion cells or batteries shipped by airplane and eliminate any exceptions to the testing of United Nations Manual of Tests and Criteria, Part III, Sub-section 38.3 requirements for all lithium-ion batteries before transport by air.
6/8/20	A-20-032	O-UR	Aviation	Once the International Civil Aviation Organization removes special provision A88 from the Technical Instructions for the Safe Transport of Dangerous Goods by Air, remove the exemption from United Nations Manual of Tests and Criteria, Part III, Sub-section 38.3 testing from Title 49 Code of Federal Regulations 173.185(e) for low-production or prototype lithium-ion batteries, when transported by air.
3/24/20	R-20-001	O-AR	Railroad	Develop maximum coupling speed thresholds and impact mass limits for hazardous materials railcars.
3/24/20	R-20-002	O-AR	Railroad	Require that tank cars involved in high-energy coupling-force events undergo a structural integrity inspection by a qualified technician before returning to service.
3/24/20	R-20-003	O-AR	Railroad	Develop methods to identify tank cars that have sustained overspeed and high-energy coupling force events.
3/24/20	R-20-004	O-AR	Railroad	After the successful development of methods to identify tank cars that have sustained overspeed and high-energy coupling force events, require that rail carriers have monitoring processes in place to promptly remove damaged tank cars from hazardous materials service.
11/19/19	H-19-018	O-AAR	Highway	Revise your Emergency Response Guidebook to include information about hazards and protective actions specific to hydrogen, and to provide guidance on how to manage incidents involving fuel cell electric vehicles and hydrogen fueling infrastructure.
11/19/19	H-19-019	O-AR	Highway	Revise all hazardous materials special permits for transporting gases in manifolded horizontal cylinders to require that requalification inspections include verifying that pressure relief devices of the correct pressure rating are used and that pressure relief device venting equipment is inspected and tested to ensure that it can withstand forces generated by pressure relief device actuation.
11/19/19	H-19-020	O-AR	Highway	Revise Title 49 Code of Federal Regulations Part 180, subpart C, Requirements for Requalification of Specification Cylinders, to ensure that inspectors requalifying cylinders verify that pressure relief devices with the correct pressure rating are used and that pressure

¹⁰³ Compiled from <https://data.nts.gov/carol-main-public/basic-search>, the “Simple Search” query tool from the NTSB, known as Case Analysis and Reporting Online (CAROL). The Appendix C results are based on querying the following fields and values: Search for = “Recommendations”; Has safety recommendation = “True”; Original published date is on or after “01/01/2019”; Original published date is on or before “12/31/2020”; and Addressee name contains “PHMSA”. In addition, recommendations for pipeline safety are excluded.

¹⁰⁴ O-UR = Open-Unacceptable Response; O-AR = Open-Acceptable Response; O-AAR = Open-Acceptable Alternate Response; C-AA = Closed-Acceptable Action

				relief device venting equipment is inspected and tested to ensure that it can withstand forces generated by pressure relief device actuation.
11/19/19	H-19-021	O-AR	Highway	Work with the Compressed Gas Association to develop design guidelines for tube trailer pressure relief device vent systems.
2/14/19	R-19-001	C-AA	Railroad	Promulgate a final standard for pressure tank cars used to transport poison inhalation hazard/toxic inhalation hazard materials that includes enhanced fracture toughness requirements for tank heads and shells. (Supersedes R-04-7)
2/14/19	R-19-002	O-AR	Railroad	Prohibit the use of those tank cars transporting poison inhalation hazard/toxic inhalation hazard materials that are constructed of nonnormalized steels and not constructed of steels meeting the highest available fracture toughness specifications, as developed from Safety Recommendation R-19-001.
2/14/19	R-19-003	C-AA	Railroad	Issue maintenance guidance to owners of US Department of Transportation Specification-105 pressure tank cars transporting poison inhalation hazard/toxic inhalation hazard hazardous materials with risk factors such as nonnormalized steel shell material and repairs or postweld heat treating near stub sill attachments and other high stress locations.