



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

September 4, 2013

The Honorable John D. Rockefeller IV  
Chairman  
Committee on Commerce,  
Science, and Transportation  
United States Senate  
Washington, DC 20510

Dear Mr. Chairman:

I am pleased to send you the Hazardous Materials Transportation Incidents Data Assessment and Improvement Plan. Section 33006(a) of the "Moving Ahead for Progress in the 21st Century" Act (Pub. L. No. 112-141, 126 Stat. 835, July 6, 2012) requires the U.S. Department of Transportation to conduct an assessment to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Section 33006(b) requires that the results of the assessment be used to develop an action plan and timeline for improving the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Enclosed is the report on the assessment, along with the action plan and timeline.

One of my priorities is to ensure the safe transportation of hazardous materials. Accurate and complete incident data are essential to understand the factors contributing to risks and the ability to focus resources in those areas that pose the greatest risks.

An identical report has been sent to the Ranking Member of the Senate Committee on Commerce, Science, and Transportation; the Chairman and Ranking Member of the House Committee on Transportation and Infrastructure; and the Chairman and Ranking Member of the House Committee on Energy and Commerce.

Sincerely,

A handwritten signature in blue ink, appearing to read "Anthony R. Foxx", written in a cursive style.

Anthony R. Foxx

Enclosure



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

September 4, 2013

The Honorable John Thune  
Ranking Member  
Committee on Commerce,  
Science and Transportation  
United States Senate  
Washington, DC 20510

Dear Senator Thune:

I am pleased to send you the Hazardous Materials Transportation Incidents Data Assessment and Improvement Plan. Section 33006(a) of the "Moving Ahead for Progress in the 21st Century" Act (Pub. L. No. 112-141, 126 Stat. 835, July 6, 2012) requires the U.S. Department of Transportation to conduct an assessment to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Section 33006(b) requires that the results of the assessment be used to develop an action plan and timeline for improving the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Enclosed is the report on the assessment, along with the action plan and timeline.

One of my priorities is to ensure the safe transportation of hazardous materials. Accurate and complete incident data are essential to understand the factors contributing to risks and the ability to focus resources in those areas that pose the greatest risks.

An identical report has been sent to the Chairman of the Senate Committee on Commerce, Science, and Transportation; the Chairman and Ranking Member of the House Committee on Transportation and Infrastructure; and the Chairman and Ranking Member of the House Committee on Energy and Commerce.

Sincerely,

A handwritten signature in blue ink, which appears to read "Anthony R. Foxx". The signature is stylized and fluid.

Anthony R. Foxx

Enclosure



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

September 4, 2013

The Honorable Bill Shuster  
Chairman  
House Committee on Transportation  
and Infrastructure  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

I am pleased to send you the Hazardous Materials Transportation Incidents Data Assessment and Improvement Plan. Section 33006(a) of the "Moving Ahead for Progress in the 21st Century" Act (Pub. L. No. 112-141, 126 Stat. 835, July 6, 2012) requires the U.S. Department of Transportation to conduct an assessment to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Section 33006(b) requires that the results of the assessment be used to develop an action plan and timeline for improving the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Enclosed is the report on the assessment, along with the action plan and timeline.

One of my priorities is to ensure the safe transportation of hazardous materials. Accurate and complete incident data are essential to understand the factors contributing to risks and the ability to focus resources in those areas that pose the greatest risks.

An identical report has been sent to the Chairman and Ranking Member of the Senate Committee on Commerce, Science, and Transportation; the Ranking Member of the House Committee on Transportation and Infrastructure; and the Chairman and Ranking Member of the House Committee on Energy and Commerce.

Sincerely,

A handwritten signature in blue ink, which appears to read "Anthony R. Foxx", is positioned below the word "Sincerely,".

Anthony R. Foxx

Enclosure



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

September 4, 2013

The Honorable Nick J. Rahall, II  
Ranking Member  
House Committee on Transportation  
and Infrastructure  
U.S. House of Representatives  
Washington, DC 20515

Dear Congressman Rahall:

I am pleased to send you the Hazardous Materials Transportation Incidents Data Assessment and Improvement Plan. Section 33006(a) of the "Moving Ahead for Progress in the 21st Century" Act (Pub. L. No. 112-141, 126 Stat. 835, July 6, 2012) requires the Department of Transportation to conduct an assessment to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Section 33006(b) requires that the results of the assessment be used to develop an action plan and timeline for improving the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Enclosed is the report on the assessment, along with the action plan and timeline.

One of my priorities is to ensure the safe transportation of hazardous materials. Accurate and complete incident data are essential to understand the factors contributing to risks and the ability to focus resources in those areas that pose the greatest risks.

An identical report has been sent to the Chairman and Ranking Member of the Senate Committee on Commerce, Science, and Transportation; the Chairman of the House Committee on Transportation and Infrastructure; and the Chairman and Ranking Member of the House Committee on Energy and Commerce.

Sincerely,

A handwritten signature in blue ink, appearing to read "Anthony R. Foxx", is written over a light blue circular stamp.

Anthony R. Foxx

Enclosure



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

September 4, 2013

The Honorable Fred Upton  
Chairman  
House Committee on Energy  
and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Mr. Chairman:

I am pleased to send you the Hazardous Materials Transportation Incidents Data Assessment and Improvement Plan. Section 33006(a) of the "Moving Ahead for Progress in the 21st Century" Act (Pub. L. No. 112-141, 126 Stat. 835, July 6, 2012) requires the U.S. Department of Transportation to conduct an assessment to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Section 33006(b) requires that the results of the assessment be used to develop an action plan and timeline for improving the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Enclosed is the report on the assessment, along with the action plan and timeline.

One of my priorities is to ensure the safe transportation of hazardous materials. Accurate and complete incident data are essential to understand the factors contributing to risks and the ability to focus resources in those areas that pose the greatest risks.

An identical report has been sent to the Chairman and Ranking Member of the Senate Committee on Commerce, Science, and Transportation; the Chairman and Ranking Member of the House Committee on Transportation and Infrastructure; and the Ranking Member of the House Committee on Energy and Commerce.

Sincerely,

A handwritten signature in blue ink, appearing to read "Anthony R. Foxx", is positioned below the word "Sincerely,".

Anthony R. Foxx

Enclosure



THE SECRETARY OF TRANSPORTATION  
WASHINGTON, D.C. 20590

September 4, 2013

The Honorable Henry Waxman  
Ranking Member  
House Committee on Energy  
and Commerce  
U.S. House of Representatives  
Washington, DC 20515

Dear Congressman Waxman:

I am pleased to send you the Hazardous Materials Transportation Incidents Data Assessment and Improvement Plan. Section 33006(a) of the "Moving Ahead for Progress in the 21st Century" Act (Pub. L. No. 112-141, 126 Stat. 835, July 6, 2012) requires the U.S. Department of Transportation to conduct an assessment to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Section 33006(b) requires that the results of the assessment be used to develop an action plan and timeline for improving the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials. Enclosed is the report on the assessment, along with the action plan and timeline.

One of my priorities is to ensure the safe transportation of hazardous materials. Accurate and complete incident data are essential to understand the factors contributing to risks and the ability to focus resources in those areas that pose the greatest risks.

An identical report has been sent to the Chairman and Ranking Member of the Senate Committee on Commerce, Science, and Transportation; the Chairman and Ranking Member of the House Committee on Transportation and Infrastructure; and the Chairman of the House Committee on Energy and Commerce.

Sincerely,

A handwritten signature in blue ink, appearing to read "Anthony R. Foxx", is written over a large, stylized blue scribble.

Anthony R. Foxx

Enclosure



U.S. Department  
of Transportation  
**Pipeline and  
Hazardous Materials  
Safety Administration**



**PHMSA**

OFFICE OF HAZARDOUS  
MATERIALS SAFETY

# HAZARDOUS MATERIALS TRANSPORTATION INCIDENTS DATA ASSESSMENT AND IMPROVEMENT PLAN



Moving Ahead for Progress in the 21<sup>st</sup> Century

**AUGUST 2013**

This page is intentionally left blank

# Table of Contents

<b><i>Executive Summary</i></b>	<b>4</b>
<b><i>1. Purpose</i></b>	<b>7</b>
<b><i>2. Methodology</i></b>	<b>9</b>
<b><i>3. Use of Incident Data</i></b>	<b>11</b>
3.1 Performance Monitoring	11
3.2 Standards Development	13
3.3 Enforce Regulations	14
3.4 Outreach, Training, and Compliance Assistance	14
3.5 Emergency Preparedness	14
3.6 Interagency Partners	15
3.7 Other Data Users	15
<b><i>4. Background and History</i></b>	<b>16</b>
4.1 Reporting Requirements from 1971 – 1979	18
4.2 Reporting Requirements from 1980 to 1989	20
4.3 Reporting Requirements from 1990 – 2004	21
4.4 Current Reporting Requirements: 2005 - Present	23
<b><i>5. Incident Data Management and Operations</i></b>	<b>27</b>
5.1 Organization	27
5.2 Information Systems and Data Repository	28
5.3 Data Operations	29
5.4 Verification of Incidents	31
5.5 Potentially Reportable Incidents	34
<b><i>6. PHMSA Costs of Collecting and Maintaining Incident Reports</i></b>	<b>36</b>
6.1 Labor and Contractor Cost	36
6.2 Hardware and Software Costs	37
6.3 Interagency Agreement for Immediate Notification Reports	39
<b><i>7. Assessment of Incident Data Adequacy</i></b>	<b>40</b>
7.1 Adequacy of Information Requested on the Incident	40
7.2 Adequacy of Methods Used by PHMSA to Verify Accuracy and Completeness	42

7.3 Adequacy of Reporting Requirements _____	47
7.4 Adequacy of Resources _____	51
7.5 Adequacy of the Database Used by the Administration and Other Users _____	51
<b>8. Recommendations _____</b>	<b>56</b>
8.1 Information Requested on the Incident _____	56
8.2 Methods Used by PHMSA to Verify Accuracy and Completeness _____	58
8.3 Reporting Requirements _____	61
8.4 Resources _____	63
8.5 Database Used by the Administration and Other Users _____	64
<b>9. Action Plan _____</b>	<b>66</b>
<b><i>Appendix A: Bibliography _____</i></b>	<b>69</b>
<b><i>Appendix B: Overview of Comments _____</i></b>	<b>73</b>
<b><i>Appendix C: Hazardous Materials Incident Report Forms DOT F 5800.1 _____</i></b>	<b>76</b>
Initial Report Form (1971 through 1989) _____	76
First Revision to the Incident Report Form – 1990 through 2004 _____	78
Second Revision to the Incident Report Form – 2005 to Present _____	80
<b><i>Appendix D: Summary of Petitions for Rulemaking _____</i></b>	<b>84</b>

# Executive Summary

The Moving Ahead for Progress in the 21<sup>st</sup> Century (MAP-21) Act requires the U.S. Department of Transportation (the Department or DOT) to conduct an assessment and develop an action plan and timeline to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving hazardous materials. This report fulfills these requirements.

This assessment and action plan build upon a preliminary internal assessment that was conducted by the Department's Pipeline and Hazardous Materials Safety Administration (PHMSA) between 2010 and 2012. In undertaking the assessment, PHMSA reviewed past rulemakings and incident reporting requirements, reports, and studies; analyzed data collected from incident reports; examined government costs associated with collecting and maintaining incident reports; and solicited comments from interested parties that focused on the key provisions in MAP-21. The key findings and recommendations for each of these provisions are outlined below:

***1. Adequacy of information requested on accident and incident reporting forms that are required to be submitted to PHMSA.*** The assessment team found that the current collection requirements and quality management processes provide sufficient information to establish and report key performance measures – specifically fatalities and major injuries that were the result of hazardous materials transportation incidents. However, limitations in the manner by which some information is currently collected, along with the design of the form, make it difficult for the Department to use and analyze the data to meet all of its needs. These limitations include: (1) lack of definitions for terminology used on the incident report form, in guidance documents, or with the online reporting tool make use difficult for report filers to complete the form; (2) a “one-size-fits-all” approach to collecting incident data could be preventing the Department from identifying risks; (3) failure codes and descriptive fields can be subjective and allow cognitive biases that can lead to incorrect conclusions about the cause of incidents and failures; and (4) filers of the incident report form do not certify that the information is accurate.

PHMSA can address these inadequacies by: (1) establishing and promulgating clear definitions for terminology used on the form; (2) creating a “smart form” that tailors information collection based on the mode of transportation and type of incident reported; (3) collecting factual and verifiable failure information and reducing or eliminating collection of information that can be subjective; and (4) requiring filers to certify that the information they submit is accurate and complete.

***2. Adequacy of methods used by PHMSA to verify that the information provided on such forms is accurate and complete.*** Accurate and complete data about hazardous materials transportation incidents is essential for identifying and targeting risks, making informed decisions, and conducting effective operations. The assessment found that PHMSA does not have a systematic and consistent approach to verify accuracy and completeness of all the hazardous materials incident data. The following are key findings: (1) reporting biases and under-reporting affect the accuracy and completeness of the data; (2) less than 60% of items contained on the form are completed by filers; (3) PHMSA has focused its verification and validation efforts on incidents resulting in fatalities and injuries and these reports have been

found to be very accurate; (4) the magnitude of data inaccuracy is ultimately unknown since no auditing is performed on incidents with low consequences; and (5) 40% of report submissions are received via paper, which require more resources to verify accuracy and completeness.

Recommendations to improve PHMSA's verification and validation of data include: (1) better documenting its verification and validation methods; (2) verifying a random sample of less consequential incidents to better understand the accuracy of the data and to determine when improvements are needed; (3) cross-referencing data from other DOT sources such as the National Highway Transportation Safety Administration's (NHTSA) Fatality Analysis Reporting System (FARS), the Federal Railroad Administration's (FRA) Rail Equipment Accident / Incident Reports (RAIRS) and investigation conducted by DOT; (4) verifying incident information from others in the supply chain, such as shippers; (5) expanding procedures for correcting errors; (6) requiring electronic reporting in order to reduce errors and focus resources on verifying data; and (7) improving compliance with the reporting requirements and understanding of the incident report form.

***3. Adequacy of accident and incident reporting requirements, including whether such requirements should be expanded to include shippers and consignees of hazardous materials.***

PHMSA's Strategic Plan states that its goal is to reduce the risk of harm to people due to the transportation of hazardous materials, focusing especially on preventing high risk events. This assessment found that the current reporting requirements meet the strategic needs of the Department by collecting data on key performance indicators – specifically incidents resulting in death or injuries. Findings on the adequacy of the reporting requirements include: (1) collecting reports on unintentional releases of hazardous materials in transportation has, in some cases, resulted in a disproportionate number of incident reports collected from seemingly insignificant events with little or no consequences and that may not have progressed into a life-threatening situation or result in serious injury; (2) PHMSA should continue to collect information from those who have physical possession of the material at the time an incident occurs, but use others in the supply chain (e.g., package manufacturers, shippers and consignees) to verify and validate information submitted on reports; (3) there was consensus within PHMSA that certain low-risk materials could be exempt from reporting requirements, but additional study is needed to determine if more widespread changes in reporting thresholds are necessary; (4) non-compliance and self-selection biases exist with the current reporting requirement; and (5) additional time may be needed by filers to collect accurate information from significant and complex incidents.

To address these findings, PHMSA can: (1) change the reporting requirements to focus data collection, processing, and analyses on those incidents that have the greatest risk to safety and the environment; (2) allow filers reporting incidents that resulted in serious consequences to file for an extension provided initial information is reported; and (3) continue to use existing authorities and regulations to conduct special studies and incident investigations in order to verify or obtain additional information from others in the supply chain.

***4. Adequacy of PHMSA resources related to data collection, analysis, and reporting, including staff and information technology.*** At present, PHMSA has adequate resources to collect and process incident report data and maintain the status quo with all the limitations identified herein. In order to ensure further data accuracy, improve collection efficiencies and

analytical capabilities, enhance and modernize information systems, or perform data governance roles, PHMSA may need to redirect and re-prioritize its current resources.

Depending on the resources available, as reflected in the President's FY 2014 budget request, PHMSA will look towards: (1) prioritizing resources to improve data governance capabilities; (2) assign dedicated staff to manage and analyze data and provide them with additional training; and (3) continue its Information Technology (IT) modernization initiatives.

***5. Adequacy of the database used by the Administration for recording and reporting such accidents and incidents, including the ability of users to adequately search the database and find information.*** This assessment found that numerous challenges exist with both data processing and analysis using PHMSA's information systems. These include: (1) insufficient metadata to ensure proper use of the data by users and analysts; (2) persistent difficulties using the online reporting tool, such as the inability to report multiple commodities from multiple packages for a single incident; (3) quality control processes force known errors to be entered; (4) limited search capabilities with the online query tool; and (5) inconsistencies between query results and published reports.

Recommendations to improve access to, and use of, incident data include: (1) establishing a "one-stop-shop" for hazardous materials incident data including definitions and metadata; (2) expanding search capabilities and assigning keywords to incident reports; and (3) redesigning and replacing the online reporting tool as part of the IT modernization effort. These recommendations are dependent on the appropriation of funds for IT modernization.

# 1. Purpose

---

The Pipeline and Hazardous Materials Safety Administration (PHMSA), and its predecessor agencies the Research and Special Programs Administration (RSPA) and Materials Transportation Bureau (MTB), have collected hazardous materials incident reports for over 40 years. The Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) establish requirements for an immediate report (see 49 CFR § 171.15) and a detailed incident report (Form DOT F 5800.1; see 49 CFR § 171.16). Over 515,000 detailed incident reports have been collected since 1971.

The incident data and information is generally used by the Department to:

1. Determine the need for regulatory changes to address changing the transportation safety environment;
2. Identify major problems or risk areas that should receive priority attention;
3. Chart trends;
4. Identify training inadequacies;
5. Evaluate packages and packaging;
6. Assess ways to eliminate or reduce releases;
7. Aid the targeting of enforcement activities; and
8. Assist in evaluating fitness for special permits and approvals.

MAP-21 requires the DOT to conduct an assessment to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous materials.<sup>1</sup> The following is an excerpt from MAP-21:

## SEC. 33006. IMPROVING DATA COLLECTION, ANALYSIS, AND REPORTING.

### (a) Assessment.

(1) In general.--Not later than 6 months after the date of enactment of this Act, the Secretary, in consultation with the Commandant of the United States Coast Guard, as appropriate, shall conduct an assessment to improve the collection, analysis, reporting, and use of data related to accidents and incidents involving the transportation of hazardous material.

(2) Review.--The assessment conducted under this subsection shall review the methods used by the Pipeline and Hazardous Materials Safety Administration (referred to in this section as the "Administration") for collecting, analyzing, and reporting accidents and incidents involving the transportation of hazardous material, including the adequacy of—

---

<sup>1</sup> Pub. L. No. 112-141, 126 Stat. 835 (2012), pp. 834-5.

(A) information requested on the accident and incident reporting forms required to be submitted to the Administration;

(B) methods used by the Administration to verify that the information provided on such forms is accurate and complete;

(C) accident and incident reporting requirements, including whether such requirements should be expanded to include shippers and consignees of hazardous materials;

(D) resources of the Administration related to data collection, analysis, and reporting, including staff and information technology; and

(E) the database used by the Administration for recording and reporting such accidents and incidents, including the ability of users to adequately search the database and find information.

(b) Development of Action Plan.--Not later than 9 months after the date of enactment of this Act, the Secretary shall develop an action plan and timeline for improving the collection, analysis, reporting, and use of data by the Administration, including revising the database of the Administration, as appropriate.

(c) Submission to Congress.--Not later than 15 days after the completion of the action plan and timeline under subsection (c), the Secretary shall submit the action plan and timeline to the Committee on Commerce, Science, and Transportation of the Senate and the Committee on Transportation and Infrastructure of the House of Representatives.

This report fulfills these requirements in MAP-21.

## 2. Methodology

---

This assessment builds upon a preliminary internal assessment that was conducted by PHMSA between 2010 and 2012 and comments received by the Federal Aviation Administration (FAA) and Federal Railroad Administration (FRA) to the preliminary assessment<sup>2</sup>. The preliminary assessment focused on the information and data collected from reported hazardous materials incidents from 2005 to 2009 and included over 60 interviews with PHMSA, FAA, Federal Motor Carriers Safety Administration (FMCSA), FRA, and the U.S. Coast Guard (USCG) staff that use and analyze incident data. The findings from these interviews are used throughout this assessment; however, to encourage candid input we did not include the specific interviewee names.

To conduct this assessment, PHMSA examined recent analyses and studies that used or pertained to hazardous material incident reports. This includes: recent policy analyses and regulatory evaluations; a report summarizing research by the Transportation Research Board (TRB); PHMSA data quality assessments and improvement plans; a U.S. House of Representatives Transportation and Infrastructure Committee (House T&I Committee) summary of subject matter for a April 22, 2010 hearing pertaining to hazardous materials safety issues; and past analyses and needs assessment. A complete list of documents and information sources examined during this assessment are included in the bibliography in **Appendix A**.

In an effort to understand the evolution of current reporting requirements and to identify recurring challenges the Department has faced with collecting and using incident data, PHMSA researched the history of incident reporting requirements since 1971. This research included reviewing historical rulemaking, reports, and studies.

DOT F 5800.1 is the primary means for PHMSA to collect hazardous materials incident data.<sup>3</sup> This assessment includes an in-depth analysis of the completeness of data collected from fields contained on the current incident report form for reports submitted between 2005 and 2011. Filers are instructed to “[f]ill in all applicable blanks accurately to the best of your ability”; however, no fields are designated as being mandatory.<sup>4</sup> Thus, PHMSA reviewed which data fields filers completed and which were left blank.

Further, this assessment includes an analysis of PHMSA’s resources and costs needed to collect and maintain the incident reporting system. This included a review of actual expenditure that occurred during fiscal year 2012 (FY 2012).

---

<sup>2</sup> Comments were also solicited from the USCG and FMCSA.

<sup>3</sup> Hazardous Materials Incident Report, Form DOT F 5800.1 (01-2004), Form Approval OMB No. 2137-0039.

<sup>4</sup> Pipeline and Hazardous Materials Safety Administration. “Guide for Preparing Hazardous Materials Incident Reports.” January 2004. p. 5.  
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/reporting\\_instructions\\_rev.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/reporting_instructions_rev.pdf) (accessed July 2013).

Finally, a Federal Register notice was published to solicit comments from interested parties focusing on the key provisions in MAP-21. A summary of responses to this notice is provided in **Appendix B**.

# 3. Use of Incident Data

---

Incident data are critical to understanding the risks of transporting hazardous materials, specifically the consequences posed to both people and the environment. Understanding these safety risks are pivotal when setting priorities, making policy, budgeting and allocating resources, drafting rules, targeting inspections, measuring performance, and communicating with stakeholders.

PHMSA uses incident data to monitor its performance, and guide decisions related to rulemaking, enforcement, training, and preparedness, as well as to determine research and development efforts, all of which will help ensure safety.

PHMSA’s strategic plan envisions a risk-based, data-driven organization where PHMSA develops *a risk management framework and improves hazardous materials transportation data collection to better target the data needed to manage the most serious risks and to detect emerging risks.*<sup>5</sup> This vision requires sound data and a strong analytical capability. ***It is for this reason, this assessment, developed to improve the quality of incident data, is so crucial to PHMSA improving the safe transportation of hazardous materials.***

## 3.1 Performance Monitoring

The number of hazardous materials transportation incidents involving death or major injury in a calendar year is one of the Department’s key performance measures for its annual performance and financial reports and is PHMSA’s only key performance indicator for its hazardous materials program budget. Data Completeness and Reliability Information accompany PHMSA’s measure in the Department’s Annual Performance Report and is summarized below.

### Statistical Issues

Results in any single year should be interpreted with caution. There is some normal annual variation in the number of reported incidents each year, particularly given the small number of these incidents, and this variation might not reflect real changes in the underlying risk.

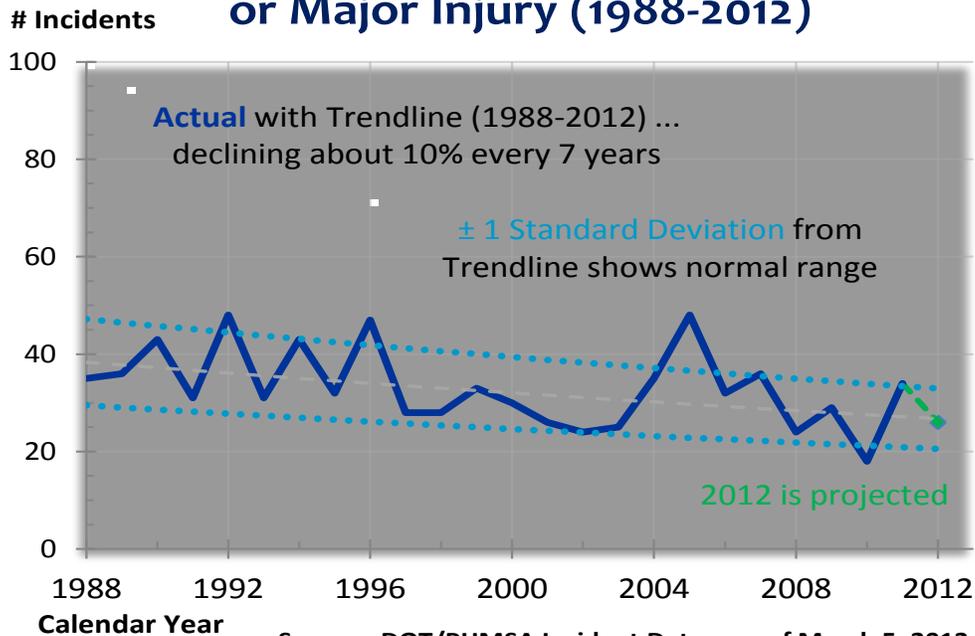
Targets are presented as ranges to account for this variation. The target each year is based on the trend line (**Figure 1** below shows a decline of about 1% on average each year over the past 25 years (1988-2012)), set at one standard deviation from the trend line to account for normal variation year-to-year. This provides about 80% probability of achieving the target if the outcome continues to follow the trend line. An exponential trend line is used to reflect the concept of diminishing returns as the numbers decline.

### **Figure 1: Trend line of Hazardous Materials Incident with Death and Injuries (D&I) with plus/minus One Standard Deviation**

---

<sup>5</sup> Pipeline and Hazardous Materials Safety Administration, “PHMSA Strategic Plan 2012-2016” (<http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/PHMSA%20Strategic%20Plan%20Final%208%203%2012.pdf>, 2012), p. 10. February 2013.

## Hazmat Incidents with Death or Major Injury (1988-2012)



The performance measure is not normalized for changes in exposure—external factors like changes in the amount of hazmat shipped, number of shipments, or U.S. population—that could affect the number of incidents with death or major injury.

**Completeness.** Compliance in reporting of incidents resulting in death or injuries is very high and most of these incidents are reported. Each person in physical possession of a hazardous material at the time an incident occurs during transportation, including loading, unloading, and temporary storage, must submit a Hazardous Materials Incident Report on DOT F 5800.1 within 30 days of discovery of the incident. After PHMSA receives a report, there may be a 30- to 60-day lag before the data are available in the database for analysis due to processing and compilation.

As depicted in **Figure 1**, PHMSA will often need to make a projection of the number of incidents for the most recent year. Projections are made from partial-year data for all months within that year for which PHMSA has complete and reliable data plus an estimated number for the missing months based on the historical fraction those months represent in the final totals over the past five years. This is calculated as follows: number of incidents using months reliable data ÷ five-year historical fraction of months represented by the reliable data = projected number of incidents (rounded to the nearest whole number). For example, if PHMSA has reliable data for nine months where there were fifteen incidents resulting in deaths or injuries and five-year historical data indicates that 75% of incidents occur during these months, PHMSA will project that there could be 20 incidents during the year ( $15 \div .75 = 20$ ).

Reliability. PHMSA routinely cross-checks incident data against other sources of data, including matching incident reports with reports made to the National Response Center (NRC) and the use of a news clipping service to provide information on significant hazmat incidents that might not be reported. If sufficient information exists, PHMSA follows up with carriers who may need to file an incident report. Incidents with death or major injury are considered to be the most reliable of the incident data. These incidents have additional verification and validation procedures to include follow-up contact with the company or individual who made the report, contact with state and local law enforcement and/or emergency response officials, and matching data with initial reports made to the NRC.<sup>6</sup>

### ***3.2 Standards Development***

PHMSA is responsible for planning, developing, and maintaining the national safety and security standards for the transportation of hazardous materials in commerce. PHMSA also participates in international standards setting forums and provides guidance in compliance and enforcement of these standards.

There are five main categories for regulatory initiatives:

- 1) enhancing safety;
- 2) harmonizing between international and U.S. standards;
- 3) incorporating special permits and approvals;
- 4) addressing statutory requirements; and
- 5) conducting “special projects” (i.e., grant processes, information collection, process improvement, and miscellaneous corrections)

PHMSA uses data from the DOT F 5800.1 to support these distinct types of regulations. Specifically, PHMSA uses incident data to:

- Conduct policy analyses to determine whether PHMSA should respond to a given petition, NTSB recommendation, Harmonization, Required reviews, or Governmental Initiatives with regulatory actions, non-regulatory actions, or a combination of the two;
- Support and develop possible changes to existing regulations as well as to inform possible new regulations governing the transportation of hazardous materials in commerce;
- Develop, advocate, and provide executive direction for policies, strategies, and procedures for the international harmonization of hazardous materials safety and security standards;
- Support regulatory and cost/benefit analysis to determine environmental and economic impacts, and impacts on small businesses and State governments; and
- Identify where Special Permits and Approvals are needed.<sup>7</sup>

---

<sup>6</sup> U.S. Department of Transportation, “Annual Performance Report: PHMSA Data Completeness and Reliability” ([http://www.dot.gov/sites/dot.dev/files/docs/dot\\_annual\\_performance\\_report\\_fy\\_2011.pdf](http://www.dot.gov/sites/dot.dev/files/docs/dot_annual_performance_report_fy_2011.pdf), 2011), p. 87. February 2013.

<sup>7</sup> PHMSA “Organizational Manual,” pp. 10 and 20.

### ***3.3 Enforce Regulations***

Incident data are crucial to planning and managing a national program of safety and security inspection and enforcement of hazardous materials regulations. Specifically, PHMSA uses incident data to help:

- Ensure compliance with the reporting requirements;
- Identify and prioritize investigations and inspections;
- Collect background information on a given company before conducting inspections;
- Conduct root cause analysis and identify potential violations;
- Determine which companies qualify for the System Integrity Safety Program (SISP) through which PHMSA provides in-depth analyses, observations, and cooperative follow-up investigations to identify the root causes of an entity's safety problems;
- Identify shippers of hazardous materials and what materials are shipped;
- Conduct package compliance testing; and
- Conduct Fitness Evaluations for Special Permits and Approvals.

### ***3.4 Outreach, Training, and Compliance Assistance***

PHMSA uses outreach and training to enhance regulatory compliance. Incident data are central to outreach, training, and compliance assistance. Specifically, PHMSA uses incident data to help:

- Decide the location and content of training;
- Adapt training to decrease knowledge gaps and improper procedures;
- Provide quality assurance; and
- Provide information and data to DOT partners.

### ***3.5 Emergency Preparedness***

PHMSA works with first responders (e.g., fire and rescue, law enforcement, emergency medical services, and other public safety agencies) that respond to hazardous material incidents to reduce the consequences of unintended releases of hazardous materials. Mitigation measures can help prevent, detect and control releases, and an effective response capability can limit consequences to people, property, and the environment.

With respect to emergency response preparedness, PHMSA uses incident data to help:

- Identify emergency response preparedness training and technical assistance requirements and needs;
- Provide funding through grants; and
- Determine improvements needed in the Emergency Response Guidebook (ERG).

### ***3.6 Interagency Partners***

PHMSA accomplishes its safety goals through a collective effort. PHMSA's partners at the state and local levels, and in other operating administrations, are essential to PHMSA's success. Through interviews and feedback on PHMSA's preliminary needs assessment, the assessment team found that PHMSA's modal partners use incident data in the following ways.

- **Federal Aviation Administration, Office of Security and Hazardous Materials** uses incident data for two main reasons: to identify investigations and to identify and analyze trends in incidents with specific commodities or packaging. Incident data are used to support the FAA Safety Management System (SMS), which relies in part upon the evaluation of available data to better understand how incremental risk indicators could be used proactively to improve safety. As part of this effort, the FAA worked with PHMSA to develop an application within the Hazardous Materials Intelligence Portal (HIP) to rank known air-mode shippers based on available background information (inspections, penalties, special permits, etc.). Incident data are an important resource the FAA currently uses in this ranking program. Separately, the Office of Security and Hazardous Materials is also participating with the FAA Flight Standards Office SMS program, as each operator's FAA-approved hazmat program is part of its overall safety program. Information obtained from the form DOT F 5800.1 is becoming an increasingly important part of these efforts.
- **Federal Motor Carrier Safety Administration, Enforcement and Compliance** does not use data from the DOT F 5800.1. However, if the quality of the data from the form improved, it could use the information collected to increase hazmat safety by conducting inspections. Specifically, to identify problems with packaging, as well as compliance reviews to identify problems with Special Permits and Approvals.
- **Federal Railroad Administration, Office of Safety** uses the data from the DOT F 5800.1 to identify where enforcement inspections should take place, as well as how many inspectors are necessary. The FRA inspectors use the information from the DOT F 5800.1 database to support a root cause analysis. The finding of the root cause analysis is often used to identify needed training and regulatory actions.
- **United States Coast Guard, Office of Operating and Environmental Standard** does not use the information collected in the DOT F 5800.1. However, if the quality of the information improved, USCG could use the information to identify trends in shippers and carriers with undeclared hazardous materials, deficiencies in regulations and training, as well as incident trends involving certain commodities or classes of dangerous goods. During interviews, it was specifically recommended that vessel information be collected.

### ***3.7 Other Data Users***

While the incident data are designed to meet the needs of the Department, it is recognized that others use the data to support their needs as well. PHMSA provides data to other Federal agencies, Congress, state and local governments, academia, industry groups, companies, and private citizens who expect the data to be accurate and complete.

## 4. Background and History

---

Hazardous materials are an important part of the American economy but also introduce some risk to the public, the environment, and property when transported. The Department is focused on protecting people and the environment from these risks in transportation of hazardous materials in commerce. PHMSA leads the national program to identify and evaluate safety risks, develop and enforce standards for transporting hazardous materials, educate shippers and carriers, investigate hazardous materials incidents, conduct research, and provide grants to improve emergency response to incidents. The FAA, FMCSA, FRA, and the USCG all contribute to achieving this goal through prevention and compliance programs focused on their modes of transportation. State and local emergency responders play an important role in mitigating the consequences of incidents that do occur.

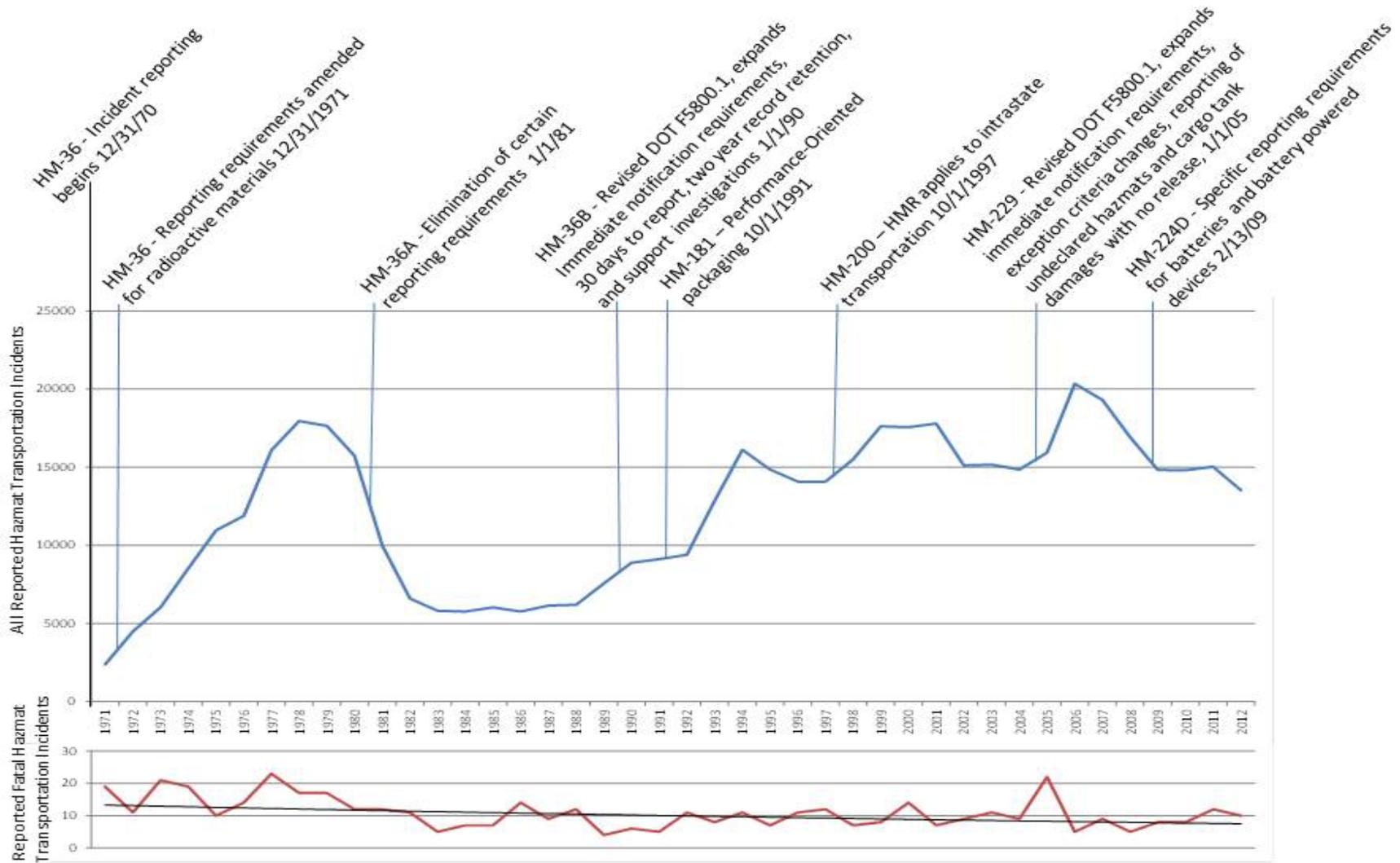
In the simplest terms, risk is defined as the probability of an event's occurrence multiplied by the consequences likely to occur ( $r = p \times c$ ). There are numerous variables that contribute to the probability of occurrence of a hazardous materials incident. These include, but are not limited to: human factors (e.g., training, experience, fatigue, attentiveness, etc.); design, condition and maintenance of the packaging, vehicle and transportation infrastructure; characteristics of materials (e.g., state (solid, liquid, gas), flash point, reactivity, volatility, etc.); environmental factors (e.g., weather, temperature, pressure differentials, etc.); and the frequency or number of shipments made (often referred to as "the denominator"). Similarly, there are many variables that affect the consequences of an incident such as: package design (e.g., secondary containment, inner liners, absorbent materials, etc.) and precautionary measures (e.g., evacuations, road closures, routing restrictions, etc.). The Department has attempted to capture and understand many of these variables by collecting information on hazardous materials transportation incidents.

To assess the present reporting requirements and collection system, it is important to understand the history of how the reporting requirements and data elements collected have evolved. The Department has collected data from accidents and incidents involving hazardous materials in transportation since January 1971. Since this time, over 515,000 incident reports have been collected.

**Figure 2** depicts the number of reports collected since 1971, as well as the number of reported incidents that resulted in fatalities – it does not depict the total number of fatalities over time. This graphic also outlines the changing reporting requirements during this time period, providing a visual perspective of the history discussed in the remainder of the chapter. There is no correlation between the overall number of incident reports received and the number of fatal incidents, nor is any implied. Further, the reporting requirements do not have a direct relationship to the number of fatal incidents that occur.

**Appendix C** highlights the three versions of the form DOT F 5800.1 that has existed since 1971.

**Figure 2: Historical Overview of Incidents Reported and Reporting Requirements (1971-2012)**



Source: Hazardous Materials Intelligence Portal, February 2013

## 4.1 Reporting Requirements from 1971 - 1979

The primary purpose for establishing incident reporting requirements and an incident report form was to create uniform reporting requirements for incidents occurring as a direct result of hazardous materials in transportation<sup>8</sup> and to address requirements found in the Hazardous Materials Transportation Control Act of 1970 (Pub. L. No. 91-458, 84 Stat. 971, October 16, 1970), which required the Secretary of Transportation to provide an annual report that included “a thorough statistical compilation of the accidents and casualties occurring in such year which involved the transportation of hazardous materials.”<sup>9</sup> Prior to this, a patchwork of modal incident reporting requirements existed and the data from these reports could not be easily analyzed collectively.

According to a 1969 notice of proposed rulemaking (NPRM) on incident reporting requirements,<sup>10</sup> the need was identified by the National Transportation Safety Board (NTSB) in a 1969 report entitled the “Uniform Reporting System for All Modes of Transportation in Reporting Incidents and Accidents Involving the Shipment of Hazardous Materials.” The NTSB made the following recommendations to the Secretary of Transportation:

1. Create a standard definition for a hazardous materials incident that is applicable to all modes of transportation;
2. Develop a uniform cross-modal reporting form;
3. Establish a central reporting system and clearinghouse to collect data, evaluate regulatory compliance by shippers and carriers, and determine the need to change requirements for containers (now referred to as packagings), hazardous classifications, or handling requirements; and
4. Develop uniform regulations for modes of transport relating to the shipment and carriage of hazardous materials and to seek legislation to accomplish this, if necessary.

A final rule was published in October 1970 establishing requirements for immediate reporting of serious incidents and the submission of a two-page written report (Form DOT F 5800.1) within 15 days of the date of discovery of an incident.<sup>11</sup> The immediate reporting requirements were published in a newly established paragraph, 49 CFR § 171.15, and required carriers to call the Department.<sup>12</sup> Section 171.15 required carriers to report “at the earliest practicable moment”

---

<sup>8</sup> “Reports of Hazardous Materials Incidents, Final Rule.” *Federal Register* 35 (31 Oct. 1970): p. 16836. <http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/35fr-1970/35fr-16836.pdf> (accessed January 2013).

Note: PHMSA maintains archive rulemakings at <http://www.phmsa.dot.gov/hazmat/regs/rulemaking/historical>

<sup>9</sup> Pub. L. No. 91-458, 84 Stat. 971, October 16, 1970.

<sup>10</sup> “Reports of Hazardous Materials Incidents, Proposed Rulemaking.” *Federal Register* 34 (29 Oct. 1969): pp. 17450 -17451.

<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/34fr-1969/34fr-17450.pdf> (accessed January 2013).

<sup>11</sup> *Federal Register* 35 (31 Oct. 1970): p. 16836.

<sup>12</sup> The USCG has maintained a 24-hour operation center to receive notifications and has collected immediate notification reports for PHMSA and its predecessor agencies. During the 1980s, this center became the National Response Center and is now the sole federal point of contact for reporting oil and chemical spills. See [www.nrc.uscg.mil](http://www.nrc.uscg.mil) for more information.

“after each incident that occurs during the course of transportation (including loading, unloading and temporary storage) which was a direct result of a hazardous material –

1. A person is killed;
2. A person receives injuries requiring his hospitalization;
3. Estimated carrier or other property damage exceeds \$50,000; or
4. A situation exists of such a nature that, in the judgment of the carrier, it should be reported to the Department even though it does not meet the criteria of subparagraphs (1), (2), or (3) of this paragraph, e.g., a continuing danger to life exists at the scene of the incident.”

Written reporting requirements were established in section 171.16 of 49 CFR. A detailed incident report was required to be submitted on form DOT F 5800.1 by each carrier when an immediate notification was required or during the course of transportation (including loading, unloading, and temporary storage) or when “there has been an unintentional release of hazardous materials from a package (including a tank).”<sup>13</sup> DOT F 5800.1 collected the following information:

- Type of operation (air, highway, rail, water, freight forwarded, or other);
- Date, time, and location of incident;
- Reporter information (name, address, and type of vehicle or facility);
- Shipment information (shipper name and address, consignee name and address, and shipping paper identification and preparer);
- Consequences (deaths, injuries, estimated damages in dollars, and quantity of materials released);
- Hazardous materials involved (classification, shipping name, and trade name);
- Nature of the packaging failure (17 multiple choices from dropped to weld failures);
- Packaging information (12 fields to complete from type of packaging to whether shipped under an exemption (now special permit));
- Remarks; and
- Preparers name, signature, contact information, and date prepared.

A year after the establishment of the reporting requirements, the regulations were amended to include immediate notification under 49 CFR § 171.15 when “breakage, spillage, or suspected radioactive contamination involving radioactive materials shipments”<sup>14</sup> occurred. The final rule also required the carriers to notify the radioactive material shipper of these incidents at the earliest practicable moment.

The number of reported incidents steadily grew from 1971 to 1980. In 1971, there were fewer than 2,400 incident reports submitted to DOT. By 1980, this number had grown to over 15,000 – with a peak in 1978 of nearly 18,000 report submissions.

---

<sup>13</sup> *Federal Register* 35 (31 Oct. 1970): p. 13862.

<sup>14</sup> “Radioactive Materials Reporting Requirements, Final Rule.” *Federal Register* 36 (4 Nov. 1971): p. 21200. [http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20File/s/36fr\\_1971/36fr-21200.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20File/s/36fr_1971/36fr-21200.pdf) (accessed January 2013).

By 1976, the Department began to recognize the limitations of the collected incident data. In its 1976 annual report to Congress pertaining to hazardous materials, the Department wrote: “since the Department lacks complete data on the volume of hazardous materials being shipped by specific mode or in any DOT specification packaging or the total number of shipments, and since it is apparent that all incidents are not reported, trends identified on the basis of incident reports are used only as general indicators of the risks involved in the transportation of hazardous materials.”<sup>15</sup>

## ***4.2 Reporting Requirements from 1980 to 1989***

The first substantial change to the reporting requirements occurred in late 1980 with the rulemaking HM-36A through which the Department established exceptions to the written reporting requirements.<sup>16</sup> Section 171.16 of 49 CFR was amended such that the written reporting requirements did not apply to unintentional releases of materials transported under the following proper shipping names: Consumer commodities; Battery, electric storage, wet; Paint, enamel, lacquer, stain, shellac *or* aluminum, bronze, gold, wood filler liquid *or* lacquer based liquid when shipped in quantities of five gallons or less. These exceptions did not apply for incidents that required immediate notification, for materials transported by air, or materials that were a hazardous waste.

The NPRM for this rule noted that “these materials do not pose significant safety or health problems” and that “a useful data base has been established and the incident patterns are clear. Little or nothing new is being learned.”<sup>17</sup> It further explained that the exception did not apply to air shipments because the “potential for serious consequences from incidents aboard aircraft which would otherwise be minor when they occur elsewhere.”<sup>18</sup> The rule did not change the incident report form.

Neither the NPRM nor final rule explains why hazardous wastes were not included in the exception. However, a review of the DOT annual report for 1980 noted that cooperation between the Environmental Protection Agency (EPA) and the Department regarding record keeping, labeling and manifesting alleviated the need for duplicative requirements.<sup>19</sup> In addition, a review of report submissions suggests that no incident reports specifically identifying hazardous wastes were submitted prior to 1979. A final rule issued on May 22, 1980 (HM-126) incorporated requirements consistent with the requirements of the Resource Conservation and Recovery Act and EPA regulations concerning the identification, packaging and handling of

---

<sup>15</sup>U.S. Department of Transportation, “Seventh Annual Report of the Secretary of Transportation on Hazardous Materials Control” for Calendar Year 1976: (OHMS archive), p. 29.

<sup>16</sup>“Elimination of Certain Reporting Requirements, Final Rule.” *Federal Register* 45 (6 Nov. 1980): page 73682. [http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/45fr\\_1980/45fr-73682.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/45fr_1980/45fr-73682.pdf) (accessed January 2013).

<sup>17</sup> “Elimination of Certain Reporting Requirements, Notice of Proposed Rulemaking.” *Federal Register* 45 (16 July. 1980): p. 40628. [http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/45fr\\_1980/45fr-40628.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/45fr_1980/45fr-40628.pdf) (accessed January 2013)

<sup>18</sup> *Ibid.*

<sup>19</sup> U.S. Department of Transportation, “Fourteenth Annual Report of the Secretary of Transportation on Hazardous Materials Control” (OHMS archive, 1980), p. 40.

materials identified as hazardous wastes. Prior to this rulemaking, hazardous materials were not required to be specifically identified if they were waste materials in transportation. In addition, this rulemaking added categories of waste materials that were not previously regulated under the HMR.

As a result of this rule, it was anticipated that there would be a reduction of approximately 30% in incident report submissions. There was nearly a 40% reduction the first year the exceptions were in place (1981) and nearly a 60% reduction the following year, in essence dropping the overall number of incidents that were reported by three quarters over two years. The number of reports remained at this new lower level over the next few years until 1989, when the number reports began to increase. The Department attributed the sharp increase of reported incidents to “an improved level of reporting by railroads and small package carriers.”<sup>20</sup> During this time, there was a decrease in the number of fatal incidents reported.

It was also during the 1980s that the NRC was established within the USCG as a result of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The NRC serves as the single national point of contact for reporting all oil, chemical, radiological, biological, and etiological discharges in the environment anywhere in the U.S. and its territories.<sup>21</sup>

### **4.3 Reporting Requirements from 1990 – 2004**

In 1984, RSPA published an Advance Notice of Proposed Rulemaking (ANPRM) to solicit comments on the reporting criteria found in 49 CFR § 171.16 and to help assess the adequacy of the information collected on form DOT F 5800.1.<sup>22</sup> This culminated in the publication of a final rule in 1989, with an effective date of January 1, 1990, that amended both the reporting requirements found in 49 CFR §§ 171.15 and 171.16 and form DOT F 5800.1.<sup>23</sup> The rule clarified that hazardous wastes were included in the notification requirements. In addition, the following new criteria for immediate notification were added to 49 CFR § 171.15:

- Evacuations of the general public lasting one or more hours;
- Closure of a major transportation artery or facility for one or more hours;
- Operational flight pattern or routine of an aircraft is altered; and
- Fire, breakage, spillage, or suspected contamination occurs involving shipment of etiologic agents.

---

<sup>20</sup> Research and Special Programs Administration, “Annual Report on Hazardous Materials Transportation,” 1989: (OHMS archive), p. 43.

<sup>21</sup> National Response Center, “NRC Background,” (<http://www.nrc.uscg.mil/nrcback.html>, (accessed January 2013).

<sup>22</sup> “Detailed Hazardous Materials Incident Reports; Proposed Rule.” *Federal Register* 49 (19 March 1984): pp. 10042- 10048.

[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/49\\_FR\\_10042.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/49_FR_10042.pdf) (accessed January 2013).

<sup>23</sup> “Detailed Hazardous Materials Incident Reports, Final Rule.” *Federal Register* 54 (19 June 1989): p. 25808.

[http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/54\\_FR\\_25808.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/54_FR_25808.pdf) (accessed January 2013).

The detailed written reporting requirements were also amended for incidents involving hazardous wastes. A copy of the hazardous waste manifest was required to be attached to the report and an estimate of the waste removed from the scene, name, and address of the facility the waste was taken, and the manner of disposition of the waste was required to be reported. Form DOT F 5800.1 was also revised in an effort to improve data collected on cause and consequences. The form remained two pages. The changes to the incident form included:

- Required specific information pertaining to the incident location (e.g., city, state, county, and route or street);
- Additional new data fields for:
  - origin and destination addresses;
  - number of people evacuated;
  - type of land use at the incident site (e.g., industrial, commercial, residential, agricultural, or undeveloped);
  - transportation phase (e.g., loading, enroute, unloading, or temporary storage);
  - type of vehicles involved (e.g., tank car, rail car, cargo container, aircraft); and
  - whether the incident was the result of an accident or derailment and conditions at the time of the accident or derailment (e.g., estimated speed, highway type, and total number of lanes);
- Description of hazardous materials involved aligned with regulatory changes (e.g., proper shipping name, chemical / trade name, hazard class, and identification number);
- Differentiated hospitalized and non-hospitalized injuries;
- Breakout of loss and damages (e.g., product loss, carrier damage, property damage, decontamination / cleanup, and other); and
- Expanded selections for the description of packaging failure – 46 distinct check-box choices describing actions contributing to packaging failure, object causing failure, how package failed, package area that failed, and what failed on packaging.

Finally, a new section was added, 49 CFR § 171.21, to require reporters to assist the Department with investigations and special studies and to provide a response to inquiries within 15 days.

It is important to note that during this time period, RSPA's hazardous materials safety program had undertaken the most extensive and comprehensive revisions to the hazardous materials regulations in the Department's history.<sup>24</sup> The 328-page final rule, published on December 21, 1990, revised the hazard communication, classification, and packaging requirements based on the United Nations Recommendations on the Transport of Dangerous Goods Model Regulations and RSPA initiatives. A principle change resulting from this rule was that the packaging requirements moved from specification-based packaging standards (explicit requirements for material, design, or product) to performance-orienting packaging standards (requirements based on achieved outcomes/goals and methods that demonstrate whether the product meets the specified goals). Incident reporting thus was viewed as essential for promoting the goal that

---

<sup>24</sup> "Performance-Oriented Packaging Standards, Changes to Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative, Final Rule." *Federal Register* 55 (21 December 1990): p. 52402.  
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/55fr\\_1990/55fr-52402.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/55fr_1990/55fr-52402.pdf) (accessed January 2013).

safety had not been compromised by these changes. The rule also expanded the materials subject to the HMR –thus more materials were regulated and incidents involving these materials would be reported. The rule became effective on October 1, 1991.

The number of incident reports submitted to RSPA nearly doubled in the years following the adoption of those two rules. RSPA’s hazardous material biennial report for calendar years 1994 and 1995 noted, “Most of this increase involved small packages carried by highway and were not considered serious. This continues to reflect the growth in this industry as well as improved awareness of reporting criteria.”<sup>25</sup> There were virtually no changes to the number of incidents resulting in fatalities.

Another significant development during this period was a final rule that required all intrastate shippers and carriers comply with the HMR with certain exceptions.<sup>26</sup> This increased the number of entities that would now be required to report incidents that occurred after the October 1, 1997 effective date. There was approximately a 15% increase in reported incidents in the years following, but it is difficult to directly correlate this increase to the rule.

#### **4.4 Current Reporting Requirements: 2005 - Present**

The rulemaking that made the most recent significant change to the incident reporting requirements was effective on January 1, 2005.<sup>27</sup> Key changes adopted in this rule included: (1) collecting more specific information pertaining to packaging and causes of failures; (2) expanding reporting exceptions; (3) expanding reporting requirements to persons other than carriers; (4) reporting undeclared shipments of hazardous materials; and (5) reporting non-release incidents involving cargo tanks. The latter two new requirements fulfilled recommendations made by the NTSB. The rule also established the ability of filers to submit their reports electronically to reduce the reporting burdens and data entry errors and to improve processing times.

In the rulemaking RSPA suggested that an “opportunity exists to obtain better, more detailed information on events, such as more descriptive information to help determine root causes of events; to offer better linkages so that data can be coupled; and to better structure the report form to facilitate complete and accurate responses.”<sup>28</sup>

---

<sup>25</sup> Research and Special Programs Administration, “Biennial Report on Hazardous Materials Transportation, Calendar Years 1994 – 1995”: p. 65.  
([http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/94\\_95biennial\\_report.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/94_95biennial_report.pdf)) (accessed January 2013).

<sup>26</sup> “Hazardous Materials in Intrastate Commerce and Improvements to Hazardous Materials Identification Systems, Final Rule.” *Federal Register* 62 (8 January 1997): pp. 1208-1217.  
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/62fr\\_1997/62fr-1208.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/62fr_1997/62fr-1208.pdf) (accessed January 2013).

<sup>27</sup> “Hazardous Materials: Revisions to Incident Reporting Requirements and the Hazardous Materials Incident Report Form, Correction, Final Rule.” *Federal Register* 69 (26 May 2004): pp. 30114-30132.  
<http://www.gpo.gov/fdsys/pkg/FR-2004-05-26/html/04-11398.htm> (accessed January 2013).

<sup>28</sup> “Hazardous Materials: Revisions to Incident Reporting Requirements and the Hazardous Materials Incident Report Form, Notice of Proposed Rulemaking.” *Federal Register* 66 (3 July 2001): p. 35156  
[http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/66fr\\_2001/66fr-35155.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/66fr_2001/66fr-35155.pdf) (accessed March 2013)

The immediate notification requirements clarified that the notifications were to be made as “soon as practical but no later than 12 hours after the occurrence.”<sup>29</sup> The following changes were made to the immediate notification requirements:

- Removed requirement to report solely on monetary damages;
- Changed etiologic agent to infectious substances to be consistent with regulatory changes and provided exceptions for diagnostic specimens or regulated medical wastes; and
- Added requirement to report a release of a marine pollutant for quantities exceeding 450 liters (119 gallons) for a liquid or 400 kg (882 pounds) for a solid.<sup>30</sup>

The detailed written reporting requirements in 49 CFR § 171.16 continued to require the reporting of unintentional release of a hazardous material or the discharge of any quantity of hazardous waste. In addition, reports were now required whenever a specification cargo tank with a capacity of 1,000 gallons or greater containing any hazardous material suffered structural damage to the lading retention system or damage that required repair to a system intended to protect the lading retention system, even if there was no release of hazardous material and for the discovery of an undeclared hazardous material. In addition, a definition was added to 49 CFR § 171.8 defining “undeclared hazardous material.”

The rule also included a requirement to update an incident report if any of the following occur within one year of the incident: a death resulting from the hazardous materials; the material or packaging information was previously misidentified; related damages, losses, or costs previously unknown become known; or related damages, losses, or costs change by \$25,000 or more, or 10% of the prior total estimate, whichever is greater.

The reporting requirement exceptions were also changed. Instead of excepting certain materials, the exceptions were based on the classification of the materials, capacity of the package, and the total release. Hazardous waste shipments or shipments offered by air still needed to be reported. The following are the current exceptions:

- The material is properly classed as an other regulated material, domestic only (ORM-D); or a Packing Group III material in Class or Division 3, 4, 5, 6.1, 8, or 9;
- Each package has a capacity of less than 20 liters (5.2 gallons) for liquids or less than 30 kilograms (kg; 66 pounds) for solids;
- The total aggregate release is less than 20 liters (5.2 gallons) for liquids or less than 30 kg (66 pounds) for solids; and
- The material is not an undeclared hazardous material.<sup>31</sup>

RSPA noted that “the exceptions in this final rule are based on the hazards the materials pose and quantities of those materials” and that it was expected “that the proposed exceptions would result in a sizeable net reduction of the total number of incident reports filed each year.”<sup>32</sup>

---

<sup>29</sup> *Federal Register* 69 (26 May 2004): p. 30131

<sup>30</sup> Summary information only, please refer to 49 CFR §§ 171.15, 171.16, and 171.21 for specific citations

<sup>31</sup> 49 CFR § 171.16(d).

49 CFR § 171.21 expanded such that shippers, package owners, package manufacturers or certifiers, repair facilities, or person reporting the incident also had to assist with investigations and special studies. The time entities have to response for such inquiries increased to 30 days.

The incident report form underwent significant revision. The form doubled in size to four pages and was accompanied by 12 pages of instructions to complete it. The following is a summary of what changed:

- Check box indicating the type of report (e.g., incident, undeclared without a release, or cargo tank damage) and whether the report was an initial, supplemental or additional pages;
- Requests NRC report number for those incidents that reported under the immediate notification requirements;
- Requests report number if a report was made to another Federal agency;
- Adds specific fields (e.g., street, city, state, and ZIP code) for both the origin and destination;
- Adds Packing Group (if applicable) for hazardous material involved;
- Asks whether the shipment was hazardous waste, and if so to provide an EPA manifest number;
- Asks if the material was Toxic by Inhalation, and if so to provide the Hazard Zone;
- Asks if the shipment was under an exemption (now special permit), approval, or competent authority (CA), and if so to provide the exemption, approval, or CA number;
- Asks whether the shipment was undeclared;
- Requests emergency response information – check boxes indicating fire / EMS, police, in-house cleanup, or other cleanup along with report numbers for fire / EMS and police;
- Requires that damage costs only need to be reported if the total damages are more than \$500;
- Requires reporting of the specific number of employees, responders, and general public that died, were injured requiring hospitalization, and/or injured, but not requiring hospitalization;
- Requires the specific the number of people in the general public and/or employees that were evacuated along with the duration of the evacuation;
- Requests information on whether a major transportation artery was closed, and if so for how long;
- Requests information on whether the vehicle was involved in a crash or derailment, in addition to the speed, the weather condition, and whether the vehicle overturned and/or left the roadway or track;
- Adds a new air-only section to differentiate cargo and passenger aircraft, determine whether the material was included in baggage or cargo, and provide where the incident occurred (e.g., cargo facility, sort center, baggage area, by surface to/from airport, during flight, or during loading / unloading of the aircraft);
- Expands packaging information to include the type of packaging, 112 failure codes (what failed, how failed, and causes of failure), packaging markings, capacity, number of

---

<sup>32</sup> *Federal Register* 69 (26 May 2004): p. 30131

packages in shipment, number of packages failed, construction and testing information (if available), and information specific to radioactive material packaging;

- Adds a new section to provide a narrative on the recommendations / actions taken to prevent recurrence; and
- Adds additional contact information – to include hazmat registration number.

The last changes to the incident reporting requirements were made in 2009 when the immediate and detailed reporting requirements were amended to specifically require the reporting of incidents involving batteries or battery powered devices. Immediate notification is required when “during transportation by aircraft, a fire, violent rupture, explosion or dangerous evolution of heat (*i.e.*, an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence) occurs as a direct result of a battery or battery powered device.”<sup>33</sup> A detailed written report is required when “a fire, violent rupture, explosion or dangerous evolution of heat (*i.e.*, an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence) occurs as a direct result of a battery or battery powered device.”<sup>34</sup>

The latest changes have not resulted in any variation in the number of reports received.

---

<sup>33</sup> “Hazardous Materials: Revisions to Requirements for the Transportation of Batteries and Battery-Powered Devices; and Harmonization With the United Nations Recommendations, International Maritime Dangerous Goods Code, and International Civil Aviation Organization’s Technical Instructions, Final Rule.” *Federal Register* 74 (14 January 2009): p. 2233.

<http://www.gpo.gov/fdsys/pkg/FR-2009-01-14/pdf/E8-31383.pdf> (accessed July 2013).

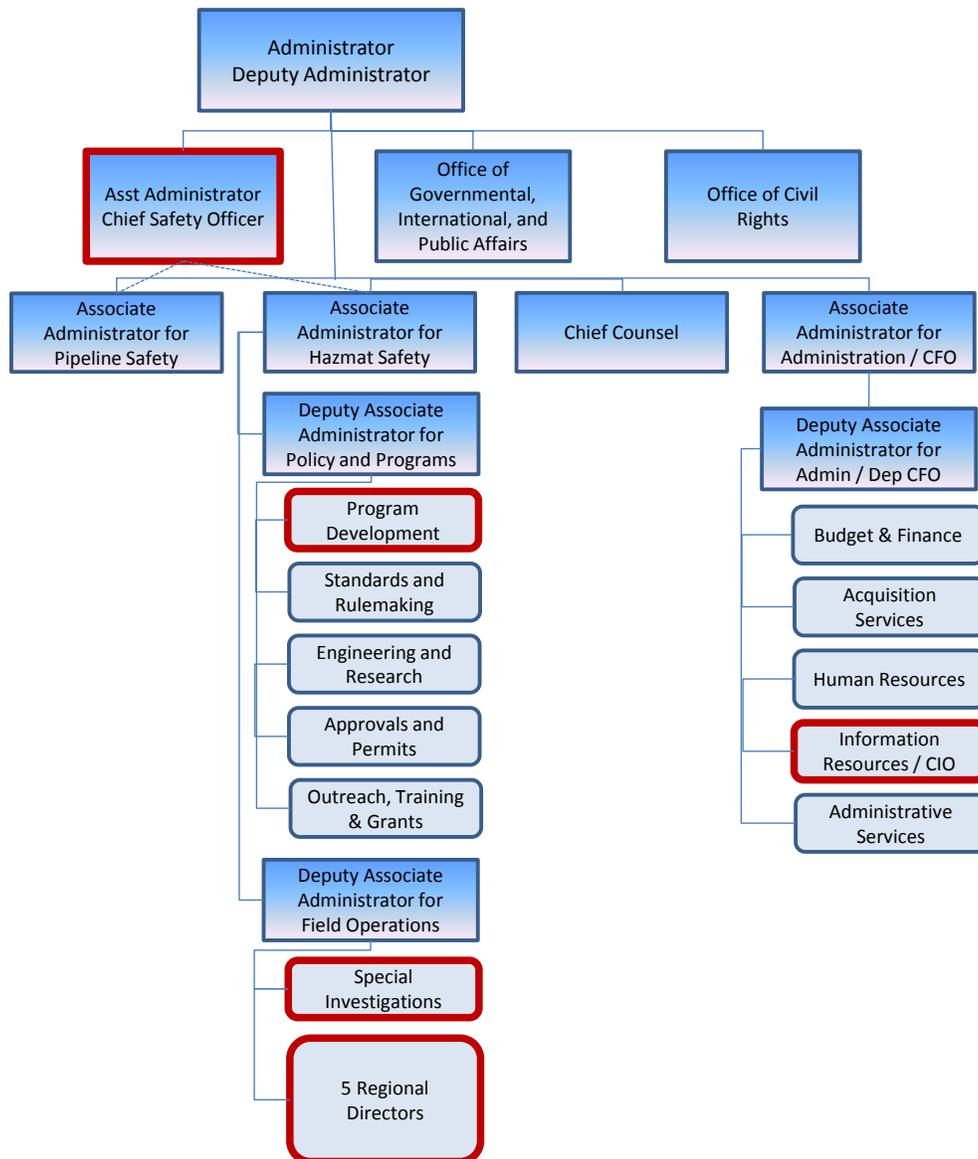
<sup>34</sup> *Ibid.*

# 5. Incident Data Management and Operations

## 5.1 Organization

Data management and information technology (IT) services, including the management of hazardous materials incident data, are distributed among several divisions within PHMSA. An excerpt of PHMSA's organization chart is provided below with each component that has functional responsibilities for data management highlighted in red.

**Figure 3: PHMSA Organizational Chart Excerpt**



The responsibilities for each of these components are set forth in the organizational manual for PHMSA. The following responsibilities are for those components highlighted in the figure above:

**The Assistant Administrator / Chief Safety Officer (CSO)** establishes, with the Chief Information Officer (CIO), a PHMSA-wide data governance structure and coordinates the safety programs' management and improvement of data quality.<sup>35</sup>

**The Office of Hazardous Materials Safety (OHMS), Program Development Division** develops data and information requirements to support the hazardous materials safety program. This division represents OHMS with other Federal, state, and local agencies and the hazardous materials transportation industry on all matters involving hazardous materials safety data.<sup>36</sup>

**The OHMS, Field Operations** conducts inspections and investigations to determine compliance with the Federal hazardous materials transportation law and regulations, enforces the hazardous materials safety regulations through the issuance of tickets or development of evidence for civil and criminal penalty actions; and investigates accidents to determine the causes and circumstances of failure, the need for corrective action, and any non-compliance that might have contributed to the accident.<sup>37 38</sup>

**The Office of Administration, Information Resources Division/CIO** leads, manages and oversees activities that include: IT policy; data management, including controls for data quality; IT budget coordination and development; IT strategic planning; Internet services; and e-government initiatives.<sup>39</sup>

In practice, the OHMS, Program Development Division develops the hazardous materials program's budget, conducts analyses and studies, oversees and manages the collection of incident data, and strives to maintain data quality. The Office of Administration, Information Resources Division/Chief Information Officer develops and maintains the IT infrastructure and data systems. The Assistant Administrator/Chief Safety Officer uses the incident data to monitor performance, evaluate program effectiveness, and conduct analyses.

## ***5.2 Information Systems and Data Repository***

The information systems and data repository are comprised of the Hazardous Materials Information System (HMIS), the HIP, and web-based services for data entry and retrieval.

**HMIS** is a web-based transactional system used by OHMS. It is an online transaction processing (OLTP) tool that supports the collection, verification, and validation of incident

---

<sup>35</sup> DOT Order 1100.74A (30 September 2010), *Department of Transportation Organizational Manual Pipeline and Hazardous Safety Administration*, p. 4.

<sup>36</sup> Ibid, p. 19

<sup>37</sup> Ibid, pp. 24 and 25

<sup>38</sup> M. El-Sibaie, Action Memorandum to the Administrator, (23 May 2011), Approval Request to Implement Temporary Organizational Changes in the Office of Hazardous Materials Safety Field Operations.

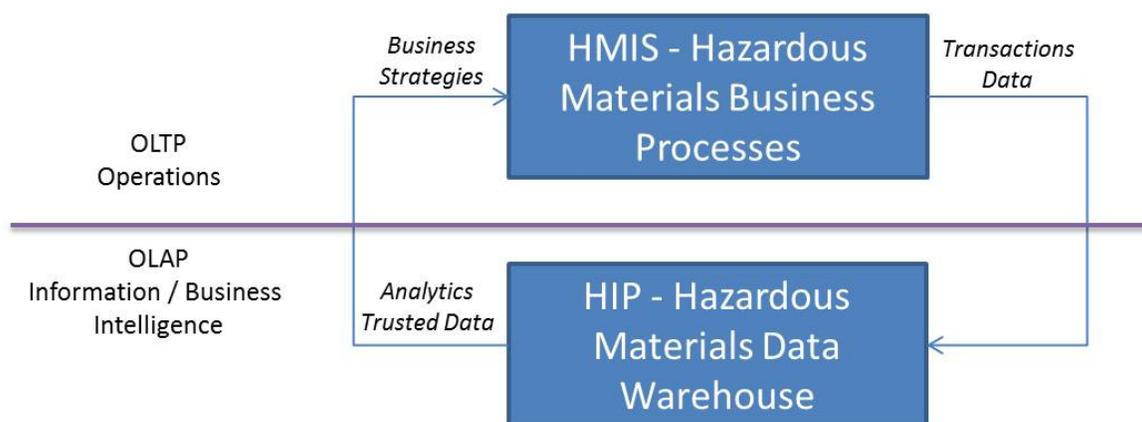
<sup>39</sup> DOT Order 1100.74A, p. 36

report data received via form DOT F 5800.1. Immediate notification reports are received automatically from the USCG's NRC to HMIS.

HMIS does not support in-depth analysis, reporting, and trending. The underlying technology for HMIS is Oracle's object-relational database management system.

**HIP** is an online analytical processing (OLAP) system that utilizes data from operational and transactional systems and serves as the trusted data repository for hazardous materials data. HIP uses the Oracle Business Intelligence Enterprise Edition to integrate inspection, incident, regulation, penalty, and other data collected by PHMSA, FAA, FMCSA, FRA, USCG, and the EPA. **Figure 4** below provides a top-level depiction of how HMIS and HIP are utilized.

**Figure 4: Utilization of HMIS and HIP**



Web-based services provide interfaces to both HMIS for online reporting of incidents and access for external users to query and download incident data files from HIP.

### 5.3 Data Operations

With the implementation of the current DOT F 5800.1, reporters have several options for submitting Incident Reports:

- **Paper forms** – both type written or handwritten forms can be submitted via email using a fillable Adobe Acrobat file and are processed as a type written form;<sup>40</sup>
- **Web** - Electronic submission via PHMSA's website – an online fillable form;<sup>41</sup> or
- **XML** - Electronic files can be submitted by authorized entities using extensible mark-up language (XML) files.<sup>42</sup>

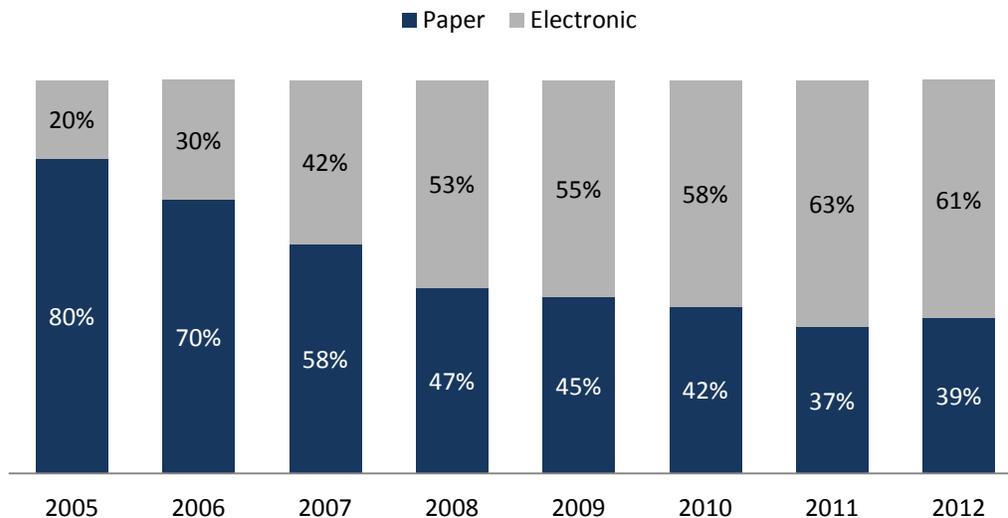
<sup>40</sup> The fillable Adobe Acrobat file is available at <http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/IncidentForm010105.pdf>

<sup>41</sup> The online fillable form is accessible at <https://hazmatonline.phmsa.dot.gov/incident/>

In 2005, 80% of the incident reports were submitted on paper forms. Each year the number of paper submissions has decreased. Currently, approximately 40% of incident reports are submitted on paper forms. It is important to note, that 60% of the paper forms are submitted by one carrier. PHMSA’s encouragement to this carrier to submit via XML has been unsuccessful.

The breakdown of how DOT F 5800.1 forms have been submitted from 2005-2011 is illustrated in **Figure 5** and **Table 1** below.

**Figure 5: Breakdown of DOT 5800.1 Submissions (Calendar Years 2005-2012)**



**Table 1: Breakdown of DOT5800.1 Submissions by Paper, Web, XML (Calendar Years 2005-2012)**

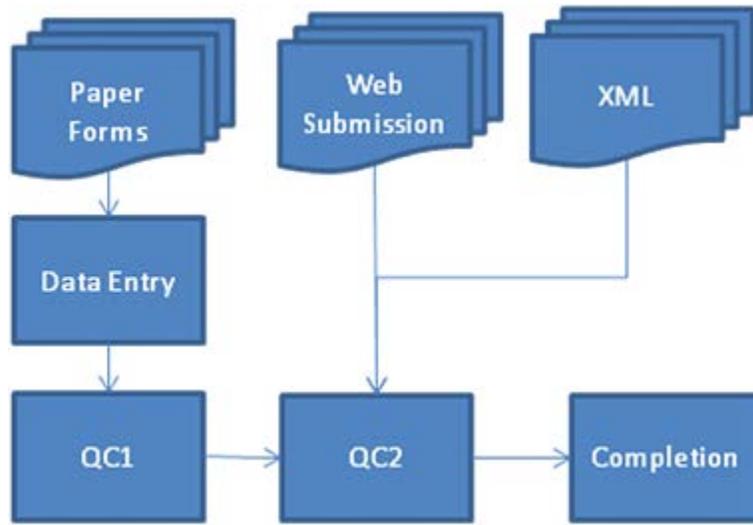
	2005	2006	2007	2008	2009	2010	2011	2012
<b>Paper</b>	12,760	14,145	11,259	8,002	6,655	6,284	5,599	5,268
<b>Web</b>	2,222	2,539	3,825	4,420	4,283	4,930	4,726	4,667
<b>XML</b>	946	3,652	4,218	4,508	3,880	3,584	4,695	3,658
<b>Total</b>	15,928	20,336	19,302	16,930	14,818	14,798	15,020	13,553

Source: Hazardous Materials Intelligence Portal, February 28, 2013

It can take one to four hours to enter the incident reports into HMIS, depending on the manner in which the form was submitted and the level of verification needed. Processing paper forms, for example, takes longer as there are additional steps than electronic submissions. **Figure 6** below depicts how the reports are processed.

<sup>42</sup> The XML schema is available at [http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/xml\\_schema.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/xml_schema.pdf)

**Figure 6: Incident Reports Completion Process**



Paper forms and any attachments provided by a reporter are logged in when received by OHMS staff. The information from handwritten forms is entered manually into HMIS while the information from type written forms are scanned and “read” using an optical character recognition system. Once the information is entered, paper forms undergo the first quality control (QC) step, which includes a detailed review of each character and field before moving to the second QC step (QC2). During QC2 information is verified and validated as needed. All incidents resulting in fatalities and injuries are verified and validated – this is discussed further below. Upon completion of QC2, the data are considered “final” for reporting purposes and available for use by both external and internal users.

During this QC process PHMSA staff might determine that a given report does not meet PHMSA’s requirements for “reportable” incidents. In these cases, the incident information is captured in the database, but the report is assigned a “non-reportable” status and this information is not used for analytical use. Examples of non-reportable incidents include incidents that do not occur in transportation, multiple submissions of the same reports for an incident, materials not covered in the HMR, or the release was from a vehicle fuel tank. PHMSA receives nearly 600 “non-reportable” incidents annually.

#### ***5.4 Verification of Incidents***

PHMSA has established an Incident Management System for validating information collected from the DOT F 5800.1, as well as collecting additional information for a given incident.

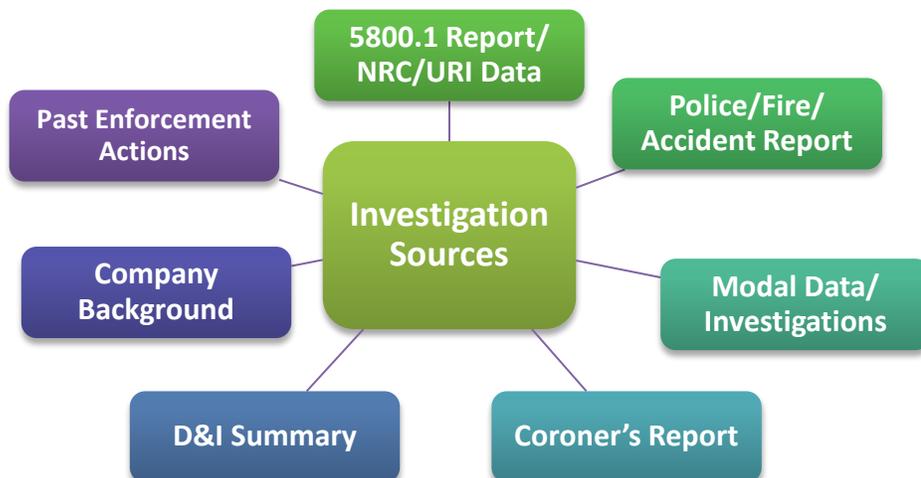
The main purpose of creating a validation system is to better understand the contributing causes of incident failures. Failure mode, or the specific causes of an incident, is an important factor to consider when mitigating hazardous materials incidents. Given report filers most often cite human error as the failure mode across all transportation phases, there is a need for further analysis. Additionally, in some cases, there might be incidents that have been misclassified with respect to cause, as different people might have interpreted reporting guidance differently.

Root cause analysis attempts to trace the chain of failures from the last failure in the chain – to the reasons why the contributing causes occurred in the first place. For example, the immediate cause of a hazmat release might be a failure to tighten a fitting, while a more fundamental problem might be the design of the fitting or the qualifications of the person with the responsibility to tighten the fitting. The aim is to identify and solve the underlying problems, or the key interaction of problems in the chain of events, rather than only the surface manifestation of that problem. Incident investigations can help PHMSA identify the contributing causes of an incident and the defenses that failed. PHMSA can then consider efforts to prevent such an incident from occurring again or minimize the consequences from the event.

In FY 2012, PHMSA began to conduct these investigations for all deaths and injury incidents; it is possible that additional criteria will be used in the future to determine incidents that need to be investigated in this way. PHMSA also plans to use this process for special investigations. For example, in FY13, PHMSA is conducting a special investigation on cargo tank rollover incidents.

**Figure 7** below depicts the main data and information sources PHMSA uses for these investigations.

**Figure 7: Sources used in Incident Investigation**



The following are data elements PHMSA collects or validates during these D&I investigations:

- Age of operator (in years) and years of experience;
- Altitude;
- Blood alcohol level;
- Body part(s) affected and nature and severity of injuries;
- Cargo tank motor vehicle configuration;
- Cleanup organization information (name, address, phone number);

- Collision;
- Company DUNS number for the carrier;
- Company DUNS number for the shipper;
- Compliance with hours of service;
- Conveyance make and model;
- Damage extent of side/top of cargo tank (length, depth of crush, dent);
- Data from DOT F 5800.1 validated;
- Data sources used to complete the form;
- Date of safety inspection of conveyance;
- Date report submitted;
- Description of contributing factors of the incident;
- Direction of rollover;
- Environmental damages;
- Estimated speed of vehicle at the time of the incident;
- Evasive actions taken by the driver;
- Fire and Emergency Medical Services information (name, address, phone number);
- Gross vehicle weight of tank;
- Ground conditions;
- HMIS input reports;
- Incident report numbers (HMIS and NRC);
- Initial estimation of contributing factors;
- Lead agency validating information;
- Lead investigator;
- Licensing special conditions and operator certifications and qualifications;
- Location of packagings;
- Longitudinal skid (in feet);
- Number of facilities closed;
- Number of homes evacuated;
- Number of response vehicles/units involved (fire, EMS, police);
- Participating agencies in incident response and recovery;
- Point of Contact comments and information;
- Police department information (name, address, phone number);
- Principal commodity involved;
- Proper placarding;
- Road classification, closures, conditions, materials, and shoulders;
- Vehicle license plate;
- Vessel type;
- Water temperature;
- Weather conditions; and
- Years the conveyance has been in service.

## 5.5 Potentially Reportable Incidents

PHMSA’s OHMS Program Development Division monitors news clippings, calls, complaints, and information received from the NRC, which collects immediate notification reports as required by 49 CFR §171.15, to identify potentially reportable incidents. This information is manually entered into an “Unreported Incident” or URI database. Media clippings are checked against reports that are received by the NRC.

Possible hazardous materials incidents that cannot be matched with either an NRC record or a DOT F 5800.1 are considered “unreported” and are sent to the Field Support Services Division for follow-up and appropriate actions which are described in more detail here. The Hazardous Materials Field Services receives approximately 25 records of potentially unreported incidents per week and is responsible for investigating whether a report was required and, if so, ensure that it is filed and any non-compliance issues are addressed (e.g., violators can be issued a warning letter or citation).

When reviewing potentially reportable incidents, analysts and enforcement staff must ascertain whether the material was hazardous and regulated, if it was being transported in commerce, and that the situation met the reporting requirements in the HMR. To determine these three things, PHMSA contacts local emergency service agencies, the shipper and carrier, and others that may have knowledge of the particular events associated with the potential reportable release. In many cases, there is insufficient information to ascertain the responsible party involved in the incident or whether the incident was reportable under the HMR and no further action is possible. Once the determination that an incident is reportable and contact information is obtained, a Field Support Services Division investigator contacts the responsible party, explains the filing requirements, the potential sanctions for failing to file a report, and directs the hazardous materials shipper or carrier to the PHMSA website.

**Table 2** below depicts the number of citations and warning letters issued by PHMSA over the past 10 calendar years citing failure to meet the reporting requirements in either 49 CFR § 171.15, § 171.16, or both.

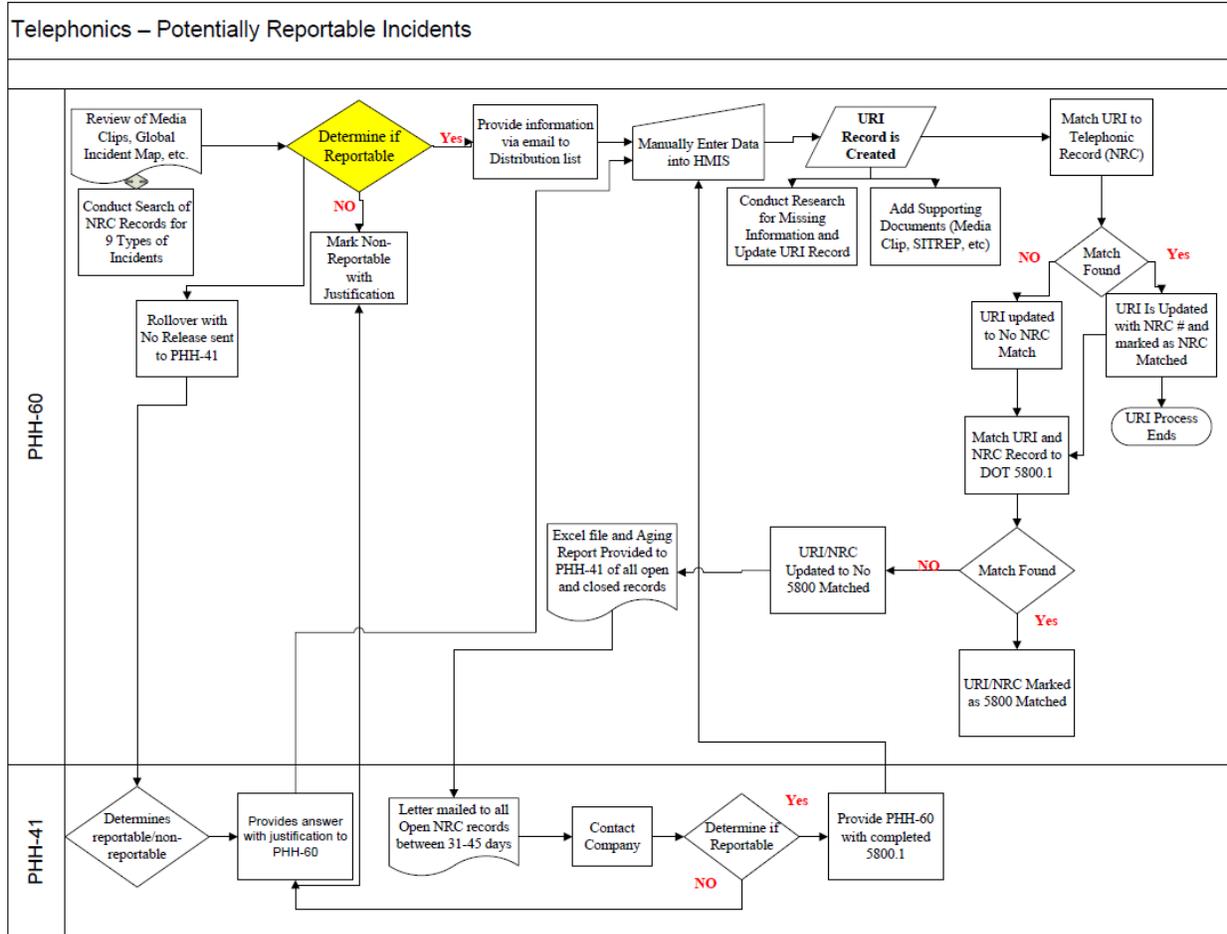
**Table 2: Citations issued by PHMSA for Not Reporting Incidents (in Calendar Years)**

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Tickets	17	0	0	0	0	0	0	106	0	3
Warning Letters	0	0	0	0	0	0	0	56	34	18

Source: Hazardous Materials Field Services, February 2013

**Figure 8** on the next page provides an overview of the potentially reportable incidents process.

**Figure 8: Potentially Reportable Incidents Process**



## 6. PHMSA Costs of Collecting and Maintaining Incident Reports

---

Incident reports processing and management occur at DOT Headquarters by a combination of Government contractors and OHMS staff. PHMSA furnishes the incident report processing contractor with equipment, software, and computer information systems to process the incident reports. Several members of OHMS staff are assigned part-time to the processing effort, primarily performing quality control.

For this assessment, the costs associated with collecting and maintaining incidents reports were examined for FY 2012. The costs to process incident reports are divided into three overall categories: (1) labor/contractor costs; (2) hardware/software costs; and (3) interagency agreement costs. These are representative of the annual expenses to perform these functions; costs to develop or enhance IT features or other periodic outlays such as replacing servers are not included in this assessment. **Table 3** below summarizes the costs incurred by PHMSA to process all incident reports both transmitted by the NRC and submitted to PHMSA during FY 2012.

**Table 3: Costs to Process Incident Reports (FY 2012 \$)**

Incident Report Processing Costs	Amount
<b>Labor and Contractor Costs</b>	
Processing contract support	\$ 419,560
Government processing support staff	\$ 99,105
Contract administration	\$ 68,741
<b>Hardware and Software Costs</b>	
Scanning hardware	\$ 1,827
Scanning software	\$ 38,415
Desktop Services and Support	\$ 29,880
IT Systems	\$ 606,000
<b>Interagency Agreement Costs</b>	\$ 20,400
<b>Total Cost</b>	<b>\$1,283,928</b>

### ***6.1 Labor and Contractor Cost***

**6.1.1 Contractor Support for Processing.** In FY 2012, the incident processing support contractor costs totaled approximately \$419,560. The contractor is responsible for receiving the incident reports, scanning and inputting the paper reports, and performing quality control.

**6.1.2 Government Processing Support Staff.** PHMSA estimated the cost of the PHMSA staff supporting the processing of incident reports using estimates of hours provided by OHMS. Locality pay tables for the area of Washington-Baltimore-Northern Virginia were used to calculate the employee salaries. The fringe benefit rate of 36.25 percent was also used, as prescribed in Office of Management and Budget (OMB) Memorandum M-08-13, “Update to Civilian Position Full Fringe Benefit Cost Factor, Federal Pay Raise Assumptions, Inflation Factors, and Tax Rates used in OMB Circular No. A-76, ‘Performance of Commercial Activities,’” dated March 11, 2008. The following is a breakdown of the costs:

- One Federal employee (GS-5) works 30 hours per week (1,560 hours per year) assisting the contractor with the processing of incident reports. The estimated cost including fringe benefits is \$39,322;
- The Contracting Officer’s Representative (GS-12) performs approximately 11 hours per week (572 hours per year) reviewing incident reports. This employee reviews incident reports that indicated a fatality or major injury, works with filers that filed reports with missing information, and reviews incident reports that were submitted electronically or through XML and in which the filer had issues. The estimated labor cost with fringe benefits is \$31,688 for FY 2012;
- Another Government employee (GS-14) performs approximately 4 hours per week (208 hours per year) reviewing incident reports that are associated with various projects of special interest. The estimated labor cost with fringe benefits is \$16,191 for FY 2012; and
- A fourth employee (GS-15) spends 2-3 hours a week (130 hours per year) reviewing incident reports involving cargo tanks. The estimated labor cost with fringe benefits is \$11,905 for FY 2012.

**6.1.3 Contract Administration.** Contract administration includes the cost of reviewing compliance with the terms of the contract, processing payments, negotiating change orders, and monitoring the closeout of contract operations. OMB Circular No. A-76, “Performance of Commercial Activities,” establishes Federal policy for the performance of recurring commercial activities.

OMB provides factors for estimating the cost to the Government for contract administration in the form of number of full-time equivalents (FTEs). The estimated number of FTEs required for contract administration for a contractor organization of less than 10 staff is 0.5 FTEs. This assessment assumed this function would be performed by a GS-13. It is estimated that the contract administration function cost is \$68,741 for FY 2012.

## ***6.2 Hardware and Software Costs***

**6.2.1 Scanning Hardware.** OHMS provides two document scanners to capture images and text related to incident reports. These scanners allow the incident report processing staff to capture report information in digital form and save the information in the HMIS.

The scanners have an acquisition cost of \$6,237 each, or a total of \$12,474 for the two scanners. It was assumed a 5-year useful life for the scanners. Using a straight line allocation method, it was estimated the scanners have an annual cost of \$1,247 each, or \$2,494 for the pair. The scanners are a shared resource. They are used to scan documents for Hazardous Materials Permits and Approvals, in addition to incident reports. Thus, this assessment allocated the annual cost of the scanners based on number of pages scanned. In FY 2012, it was estimated the incident reporting process was responsible for 80,344 of the 109,684, or 73.3% of the pages scanned.

Thus, the estimated annual cost (FY 2012) associated with the scanner hardware is \$1,827.

**6.2.2 Scanning Software / Services.** The reporting process employs document and image capture software to process the incident reports and supporting documentation. The software is designed to accelerate the processing of incident report documentation by capturing paper documents and forms and transforming them into information to be loaded into the HMIS. OHMS has procured two software packages to enable the document capture process; one system is for text document processing, and the second is for image capture.

The text document processing software is licensed on an annual fee basis with a one-time installation/upgrade cost in FY 2012. The annual fee for the software is \$13,373. The one-time installation/upgrade cost of the software was \$18,600 in FY 2012. It was assumed the one-time installation/upgrade costs will be spread over a 5-year period, so the estimated annual cost is \$3,720.

The image processing software is licensed on an annual fee basis and cost \$35,000 in FY 2012. For this assessment, 73.3% of these costs were allocated to incident report scanning based on the number of documents scanned. Therefore, the annual cost for image processing software was determined to be \$25,368.

**Table 4** below summarizes the costs of the scanning software and services.

**Table 4: Costs of Scanning Software and Services**

	Annual Cost	Allocation Rate	Allocated Annual Cost
<b>Text document processing</b>			
One-time fee	\$3,720	73.3%	\$2,725
Annual fee	\$13,723	73.3%	\$10,052
<b>Image processing annual fee</b>	\$35,000	73.3%	\$25,638
<b>Total Costs</b>			<b>\$38,415</b>

**6.2.3 Desktop Services and Support.** PHMSA staff and contractors use the Department's common operating environment that provides computers, data storage, electronic mail, Internet access, intranet connectivity, desktop software applications, helpdesk support, and other IT functions. These services are provided by the Office of the Secretary of Transportation's Chief

Information Officer and funded by PHMSA. The costs for these services are \$3,500 per user per year. The funding also provides replacement computers every 3 years for each user; however, PHMSA is responsible for providing an initial computer for users and for replacing computers that fail within the 3-year life-cycle window. In FY 2012, the cost for desktop services and support for staff and contractors processing and managing incident report data was approximately \$29,880 (\$27,300 for the common operating environment (7.8 users x \$3,500 and \$2,580 for two new or replacement computers in FY 2012).

**6.2.4 Shared IT Systems.** HMIS, HIP, and the Online Reporting Tool make up the largest share of the total cost to process, store, and use incident reports. These systems are managed by the PHMSA's Chief Information Officer and funded by the OHMS. It is difficult to breakout the costs of the incident reporting components of these systems, so the cost was estimated using a proportional methodology. The incident reporting subsystems comprise one-sixth of the HMIS and HIP, thus one-sixth of the funding provided for IT systems is used to determine the incident reporting system costs. Added to this is a portion of the cost for a Database Administrator and data cleansing services with Dun and Bradstreet; therefore it is estimated that \$606,000 annually is required to provide these incident reporting IT systems.

### ***6.3 Interagency Agreement for Immediate Notification Reports***

PHMSA has an interagency agreement with the USCG's NRC to collect immediate notification reports required under 49 CFR § 171.15. The NRC operates 24 hours a day, 7 days a week, and 365 days a year. Reports received by the NRC are electronically transferred to PHMSA's HMIS daily. The costs for these services in FY 2012 were approximately \$20,400.

# 7. Assessment of Incident Data Adequacy

---

Renowned quality authority, Joseph Juran, asserted that “decisions are no better than the data on which they are based. And a data quality program can help ensure that data are of the highest possible quality.”<sup>43</sup> Data quality has several attributes including accuracy, completeness, consistency, timeliness, and the ease of audit.

PHMSA’s strategic plan identifies the challenges the agency faces that require accurate and sufficient incident data to develop and adapt strategies to overcome. These include:

- Bulk transportation of hazmat that is toxic by inhalation (TIH);
- Hazmat that presents a risk of fire aboard aircraft;
- Tank truck crashes and rollovers;
- Human error and poor safety culture;
- Understanding and targeting risk; and
- Mitigation and emergency response.<sup>44</sup>

A majority of individuals interviewed for this assessment indicated that they would use incident data more if it were of higher quality.

Most of those interviewed agreed that factual and verifiable data answering “who,” “what,” and “when” is a realistic expectation of information that can be accurately reported and collected. Most also agreed that causal information, “how” and “why” can be subjective and biased and should not be relied upon to make programmatic decisions without more robust verification and validation to help determine root cause.

## 7.1 Adequacy of Information Requested on the Incident

The information collected using form DOT F 5800.1 is “fundamental to hazardous material transportation risk analysis and risk management by government and industry. It allows [PHMSA] to better understand the causes and consequences of hazardous material transportation incidents. The data are used to identify trends and provide basic program performance measures. It helps to demonstrate the effectiveness of existing regulations and to identify areas where changes should be considered. It also assists all parties, including industry segments and individual companies, in understanding the types and frequencies of incidents, what can go wrong and possible measures that would prevent their recurrence. The accurate and complete description of incidents can make a significant contribution to continual safety improvement through better regulations, cooperative partnerships, and individual efforts.”<sup>45</sup>

---

<sup>43</sup> J.M. Juran, and A.B. Godfrey, *Juran's Quality Handbook*, 5<sup>th</sup> ed., (New York: McGraw-Hill, 1999), 9.11.

<sup>44</sup> PHMSA “2012-2016 Strategic Plan”, pp. 9-10.

<sup>45</sup> *Federal Register* 69 (26 May 2004): p. 30125.

The assessment team found that the current collection requirements and quality management processes provide sufficient information to establish and report on key performance measures – specifically fatalities and major injuries that were the result of hazardous materials transportation incidents.

However, shortcomings with the information currently collected, along with the design of the form, make it difficult to use the data to meet many of the needs identified above. Many of these shortcomings are discussed below.

**7.1.1 Lack of Definitions.** While PHMSA has a data dictionary for the incident reporting subsystem, it focuses on defining objects or items in the data model for the benefit of programmers and others within PHMSA who use the data models. This data dictionary is not sufficient to ensure filers use terms consistently and accurately, nor is it sufficient to ensure analysts and other users interpret and use the data correctly.

For example, there are a number of terms used in the DOT F 5800.1 that have ambiguous definitions, such as “injury or illness,” “serious,” and “major transportation artery or facility,” sometimes making it difficult for filers to report information and, thus, for PHMSA to analyze it. In addition, there are 56 failure codes that have no definitions provided.

**7.1.2 Information Needs.** The risks of transporting hazardous materials are not linear nor are they evenly distributed among the different modes and packaging variations. Therefore, the “one-size-fits-all” approach to collecting incident data could be preventing the Department from identifying emerging risks or leading indicators of performance. Incidents are often considered to be lagging indicators, in the sense that they tell us what has already happened, while people want to understand what is likely to happen in the future to ensure risks can be targeted effectively. Some of these risks include a turning point in company performance or investment, changes in materials or processes, or a change in external factors affecting the systems.<sup>46</sup> Such impacts occur within subgroups of the regulated community and may only affect certain modes, commodities, or packaging type. This is one reason why PHMSA has collected near-miss<sup>47</sup> information since unintended releases without consequences can be warning signs or leading indicators of emerging problems; the difficulty lies with striking the correct balance.

**7.1.3 Failures.** Failure mode, or the specific causes of an incident, is an important factor to consider when preventing and mitigating hazardous materials incidents. However, PHMSA’s failure codes are often subjective and do not point to the transportation phase at which a failure occurred. In addition, incident cause codes cannot deal effectively with sequences of failures.

---

<sup>46</sup> Pipeline and Hazardous Materials Safety Administration, “Evaluating the Major Safety Data Programs for Pipeline and Hazardous Materials Safety” (<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/DQA%20Report.pdf>, 10 November 2009), p. C-8. February, 2013.

<sup>47</sup> PHMSA has no published definition for what constitutes a “near-miss”. For this assessment, a near miss is defined as any incident that has the potential to cause harm, but due to circumstances no harm occurred. This definition was derived from a literature search of government, industry and academic sources. Near misses are discussed further in section 7.3.

Hazmat incident reports do permit entry of multiple cause codes, but they are not tied to the sequence of events.<sup>48</sup>

Numerous comments to the docket suggest, and this assessment agrees, that many failure codes are subjective, vague, or repetitive. Specifically, the following “causes of failure” terms are subjective, introduce cognitive biases, and should be removed or revised to provide useful, meaningful, and reliable data: human error; inadequate accident damage protection; inadequate maintenance; inadequate preparation for transportation; inadequate procedures; inadequate training; incompatible product; and misaligned product.

**7.1.4 Certifying Incident Data.** PHMSA’s desire is to obtain accurate and correct data. While PHMSA believes most filers provide accurate information and has no evidence to suggest that filers purposefully submit erroneous reports, it receives no assurances that submitted incident reports are complete and accurate based on the information available to those who file them.

## ***7.2 Adequacy of Methods Used by PHMSA to Verify Accuracy and Completeness***

PHMSA does not have a systematic and consistent approach to verify accuracy and completeness of **all** hazardous materials incident data. Instead, PHMSA has focused its verification and validation efforts on incidents resulting in more serious consequence. QC procedures, discussed above in section 5.3, are well documented and focus on the quality of the data that is entered into the system, but do not verify that the information provided by the filer is factual and accurately describes the incidents. While PHMSA has recently begun to validate and verify incidents with serious consequences, no scientific methods to verify and monitor data for incidents with less serious consequences have ever been developed. For instance, no random audits are performed nor are there procedures for correcting systematic errors found during analyses of large subsets of data. Other issues related to the accuracy and completeness of incident data identified during this assessment are further discussed below.

**7.2.1 Under-reporting.** Hazardous materials incident reporting is a census of all incidents that meet the reporting requirements; it is not intended to be a survey with statistical margins of error. The most significant challenge with collecting information is ensuring compliance with the reporting requirements so that the data are representative of the actual safety condition and environment. Under-reporting of incidents has been a prevailing problem that remains unresolved. In 1986, a report by the Congressional Office of Technology Assessment<sup>49</sup> estimated that at least half of all hazardous materials transportation incidents are not reported to DOT. Twenty-one years later, PHMSA reported that its examination of a three-year period

---

<sup>48</sup> Ibid, p. C-14

<sup>49</sup> U.S. Congress, Office of Technology Assessment (OTA), *Transportation of Hazardous Material*, 99<sup>th</sup> Congress, 2<sup>nd</sup> sess., July 1986. The Congressional Office of Technology Assessment closed on September 29, 1995. OTA provided Congressional members and committees with objective and authoritative analysis of complex scientific and technical issues.

(2004-2006) found “incidents that are reported to us might represent only 10-40% of all incidents that are actually occurring.”<sup>50</sup>

Furthermore, there is a large disparity between those who consistently report and those that report only when there have been serious consequences.

Past examinations by PHMSA staff indicate that there is a tendency for some to report only if there is a severe incident. When evaluating incidents occurring between 2000 and 2005, PHMSA found 93% of carriers submitted between one and 20 reports, which represented only 7% of all incidents reported. More importantly, these reports represented 74% of incidents that resulted in a fatality. This group also represented the largest percentage of incidents resulting in major and minor injuries and evacuations. In contrast, nearly half of all reports received each year are provided by two carriers – Federal Express and United Parcel Service. Yet, these companies never reported a fatality and only report 2% of the injuries that resulted in a hospital visit without an admission. These findings indicate a possibility that there are a number of carriers that have less severe incidents but never report them.

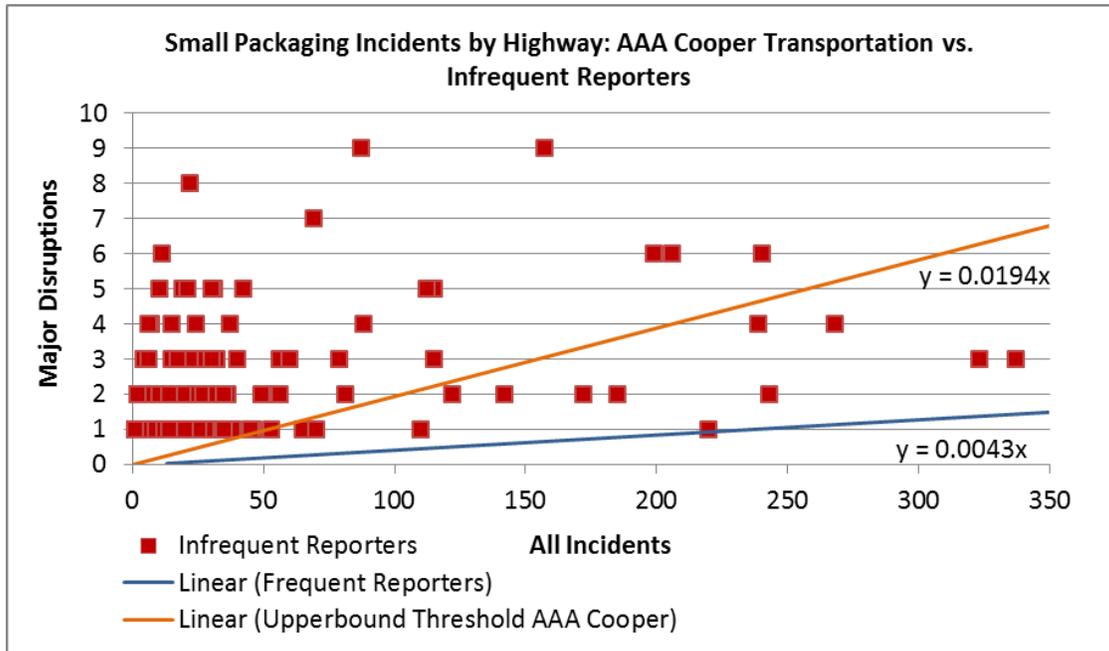
A recent preliminary analysis conducted by PHMSA’s CSO staff in late 2012 found similar results for non-bulk package transported by highway. Companies that have a history of consistent reporting (e.g., are frequent reporters) are the least likely to have incidents reported that result in major transportation disruptions (one in 183). Whereas infrequent reporters have a statistically higher number of disruptions (one in 20) and thus are most likely under-reporting.

**Figure 9** on the next page depicts the statistical upper and lower bounds of companies that can be considered consistent reporters. AAA Cooper Transportation represents the upper bound and other frequent reporters (including UPS and FedEx) represent the lower bound. A large portion of carriers were outside these upper and lower bounds, suggesting unreliable reporting.

---

<sup>50</sup> Pipeline and Hazardous Materials Safety Administration, “Estimating the Extent of Under-Reporting of Hazmat Incidents, Preliminary Findings” (Internal PHMSA Document, 11 May 2007), p. 1.

**Figure 9: Statistical Upper and Lower Bound Representation of Consistent Reporters**



Source: HIP, August 18, 2011 – using incident data from January 1986 to August 2011.

In 2005, PHMSA initiated an effort to improve collection of incident data when there has been a report made to the NRC or the incident has received media attention. This was discussed more in section 5.5 above. While this effort has improved the collection of incidents with more serious consequences, it is unclear if it has had an impact on compliance with reporting requirements. In addition, it still does not address the significant problem with under-reporting of less serious incidents.

**7.2.2 Incomplete Reports.** Incomplete reporting was a problem identified before the 1990 and 2005 changes to the incident report form. Several changes to the form in 2005 were intended to make completion simpler, thus increasing the likelihood of the form being completed. However, problems persist. In 2009, the House T&I Committee also recognized this issue and stated:

“Of particular concern is PHMSA's incident database. Over the past six months, Committee investigators have reviewed approximately 50,000 to 60,000 incident reports filed between 2000 and 2009. We found that the data was incomplete, often leaving out important information . . .”<sup>51</sup>

As a result, PHMSA attempted to determine item response rates as part of this assessment by creating a matrix to outline the likelihood of each of the 146 data fields in the DOT F 5800.1

<sup>51</sup> House. Committee on Transportation and Infrastructure. *Concerns with Hazardous Materials Safety in the U.S.: Is PHMSA Performing its Mission?*, 111<sup>th</sup> Cong., 1<sup>st</sup> sess., 10 September 2009.

form being completed by the filer. OMB Standards and Guidelines for Statistical Surveys states that an agency should conduct an analysis of item non-response when the response rate is less than 70% to determine whether there is a bias or if the data are missing at random.<sup>52</sup>

A key finding from analyzing this matrix is that all incident reports are equally incomplete (e.g., there is little difference between incidents with deaths or injuries, less consequential incidents, or undeclared reports with or without a release); on average, less than 60% of items on submitted DOT F 5800.1 are consistently complete. It is extremely difficult to conduct a bias analysis given that certain fields are completed only when certain conditions are met and it is not always possible to determine whether the field should have been completed.

The analysis highlighted that information needed for top-level performance measures are present more than 95% of the time for all reported incidents, D&I incidents, and undeclared incidents:

- Incident date and time;
- Incident city and state;
- Mode of transportation;
- Carrier name and state;
- Shipper name;
- Commodity proper shipping name and hazardous class;
- Quantity released; and
- Consequences (fatalities, hospitalizations, environmental damage, evacuations, major artery closed).

However, two critical pieces of information PHMSA needs to monitor and enhance safety – packaging and failure codes – are the least likely to be collected.

- **Packaging** data fields, specifically packaging capacity, quantity, and package construction and test information, are consistently below OMB’s requirement of 85% frequency, ranging from being reported 2.6% to 79.8% of the time.<sup>53</sup>
- **Failure Code** data fields, specifically, what failed, how it failed, and the cause of the failure are reported between 41.8% and 72.6% of the time for D&I and undeclared incidents. For all reported incidents, these data fields are completed roughly 87% of the time.

Missing data does not appear to be random. However, reasons for omissions cannot be definitely determined by an analysis of the submissions alone.

The lack of information on packaging is particularly problematic for PHMSA because of its charge to regulate the “shipment of hazardous materials and the manufacture, fabrication,

---

<sup>52</sup> Office of Management and Budget, “Standards and Guidelines for Statistical Surveys” ([http://www.whitehouse.gov/sites/default/files/omb/inforeg/statpolicy/standards\\_stat\\_surveys.pdf](http://www.whitehouse.gov/sites/default/files/omb/inforeg/statpolicy/standards_stat_surveys.pdf), September 2006), 16, February 2013.

<sup>53</sup> There are a couple exceptions to this finding. For undeclared incidents, PHMSA collects the following data fields more than 85% of the time: packaging type for Container 1, material of construction for container 1, Package number in shipment and package number failed. In addition, package material for container 2 for all incidents is collected more than 85% of the time.

marking, maintenance, reconditioning, repair, or test of multi-modal containers that are represented, marked, certified, or sold for use in the transportation of hazardous materials.”<sup>54</sup> PHMSA has struggled with collecting packaging information since 1970. This, in large part, is because the carrier often does not have the information that is being requested. Instead the carrier needs to contact the shipper to obtain information related to the packaging.

Not having comprehensive information on the contributing causes of an incident poses challenges for PHMSA to determine what policies, regulatory and non-regulatory, can and should be taken in order to mitigate and prevent such incidents from happening again in the future. It is for this reason that PHMSA recently launched an investigation program that both validates and verifies the data collected in the DOT F 5800.1 as well as collects additional data fields that are critical to identify the potential contributing causes to a given incident, as discussed in section 5.4. With this new information PHMSA will be able to conduct more effective and accurate analysis that will help enhance safety and minimize consequences in the transportation of hazardous materials.

**7.2.3 Accuracy.** The full extent of data inaccuracies cannot be known without completing an audit of reports received and a comparison with investigations conducted by trained staff.

Accuracy of packaging data are questionable given that a carrier or person completing the report may not have the information about the package. Moreover, in conducting incident investigations in FY 2012, PHMSA found that while the basic information on the DOT F 5800.1 (i.e., location of incident, commodity involved, consequences) aligned to that in police reports, information related to the failure codes did not.

These findings along with those from the Incident Data Matrix discussed above are consistent with that of our interviews mentioned at the beginning of the chapter. Specifically, PHMSA is able to collect reliable information that answer the questions related to “who,” “what,” and “when”; however, information that pertains to the “how” and “why” is more difficult to collect and not consistently reliable when it is collected.

The assessment team identified some potential contributing factors for the reason why incident data have this accuracy challenge:

- Not all data fields can be completed based on observation of the incident, especially, if the person filling out the form is a third party contractor that does not have extensive hazmat knowledge and did not discover the incident;
- Given that PHMSA does not require the DOT F 5800.1 filer to certify that the information provided is accurate, it is difficult for PHMSA to identify an individual capable of verifying the information submitted;
- The carrier or the person required to complete the form did not receive training on the purpose and significance of the DOT F 5800.1. Carriers may not know that the information in the DOT F 5800.1 can have an influence on regulations.

---

<sup>54</sup> “Delegations to the Administrator of the Pipeline and Hazardous Materials Safety Administration,” Title 49 *Code of Federal Regulations*, Pt. 1.97 (b)(1), 2012.

- The shipper possesses all the packaging information, yet the carrier is often the one completing the DOT F 5800.1 using only information that is available; and
- Timeliness of incident reporting, as memories and recollection fade with time.

**7.2.4 Processing Paper Forms.** Paper forms and any attachments provided by a reporter require additional quality control procedures to ensure accurate information is entered into the database. As noted above, information from handwritten forms are entered manually into HMIS, while the information from typewritten forms is scanned and “read” using an optical character recognition system. 40% of the forms received require these verification and validation procedures, but can still lead to erroneous data being entered into the system if forms are illegible or misinterpreted.

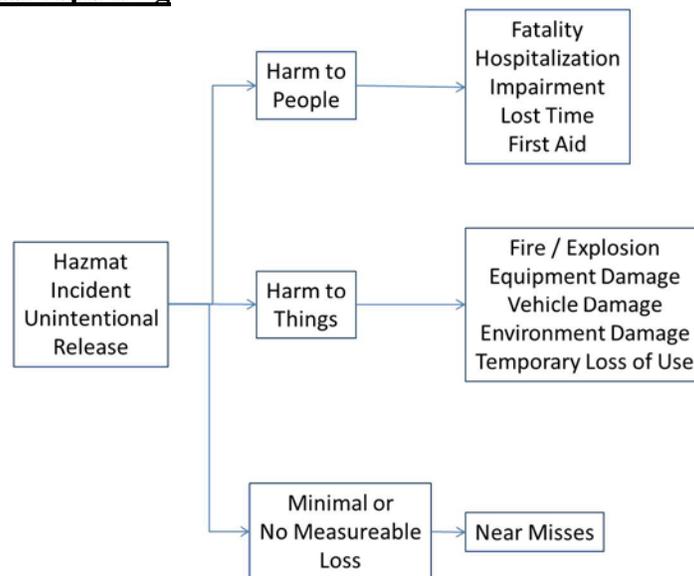
### 7.3 Adequacy of Reporting Requirements

The Department has been collecting data on unintended releases, with some exceptions, since it began collecting data in the 1970s. The Department has long believed that any unintentional release of a hazardous material in transportation has the potential to cause harm. Thus, the Department has been collecting near miss data from hazardous materials incidents – only we didn’t recognize or state it as such. The data has allowed the Department to systematically identify risk factors and to take actions to address these factors – whether through regulatory changes, enforcement, or compliance assistance.

Much has been written about the value of collecting near miss (or close call) data. A near miss is any incident that had the potential to cause harm, but due to circumstances no harm occurred.

**Figure 10** below depicts this logic.

**Figure 10: Near Miss Reporting**



The value of a near-miss reporting system can be measured by the consequences that can be avoided using the near-miss data.

**7.3.1 What is Reported.** PHMSA estimates that there are approximately one million shipments of hazardous materials each day in the U.S., and based on reported incidents, it is estimated that 99.995% of the materials are transported without incident and only 0.00001% of hazardous materials shipments result in a death or major injury.<sup>55</sup> In 2012, only 0.17% of reported incidents resulted in deaths or major injuries. Thus, most of the incidents PHMSA collects data on might be best characterized as low probability events with very low consequence.

A recent PHMSA report on the Top 10 commodities and failure modes that result in the greatest risk used only 10% of the commodity information and 30% of the failure mode information collected between 2005 and 2009.<sup>56</sup> All of the Top 10 commodities in this study involved materials transported in bulk containers, yet 84.7% of incident reports involve non-bulk packagings. Furthermore, a review of all reported incidents since 1972 did not find any fatalities resulting from an unintentional release from non-bulk packagings when transported by a surface mode, unless the materials were involved in a vehicular accident. These figures underscore the fact that there are a disproportionate number of incident reports collected that are seemingly insignificant with little or no consequences and that could not have progressed into a life-threatening situation.

This is consistent with a finding in a FY 2000 Department-wide program evaluation that states:

“48 [incidents] are minor and do not have serious consequences. A typical hazardous materials incident might be a fiberboard package leaking flammable liquids that is discovered during the loading or unloading of a truck where no one is injured.”<sup>57</sup>

As a result, reports with minor or no consequences are often discarded from analysis data sets at the outset of projects – usually those incidents occurring when transported by ground. In other words, the data from many of these incidents are not used to increase safety in the transportation of hazardous materials, which is ultimately the purpose of collecting incident data in the first place.

**Figure 11** below provides an illustration of the significance of this issue of potentially over collecting near-miss incidents. This graphic illustrates the proportional breakdown of over 165,000 incidents that were reported from 2001-2010. All reported incidents are represented in

---

<sup>55</sup> PHMSA’s estimate is a rough extrapolation of a 1998 analysis conducted by RSPA that estimated there were more than 800,000 daily shipments of hazardous materials. The basis for this is the increased tonnage of hazardous materials transported as reported in U.S. Census Bureau Commodity Flow Surveys between 1997 and 2007. U.S. Department of Transportation, “Hazardous Materials Shipments” (October 1998).

(<http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/hmship.pdf>). May 2013.

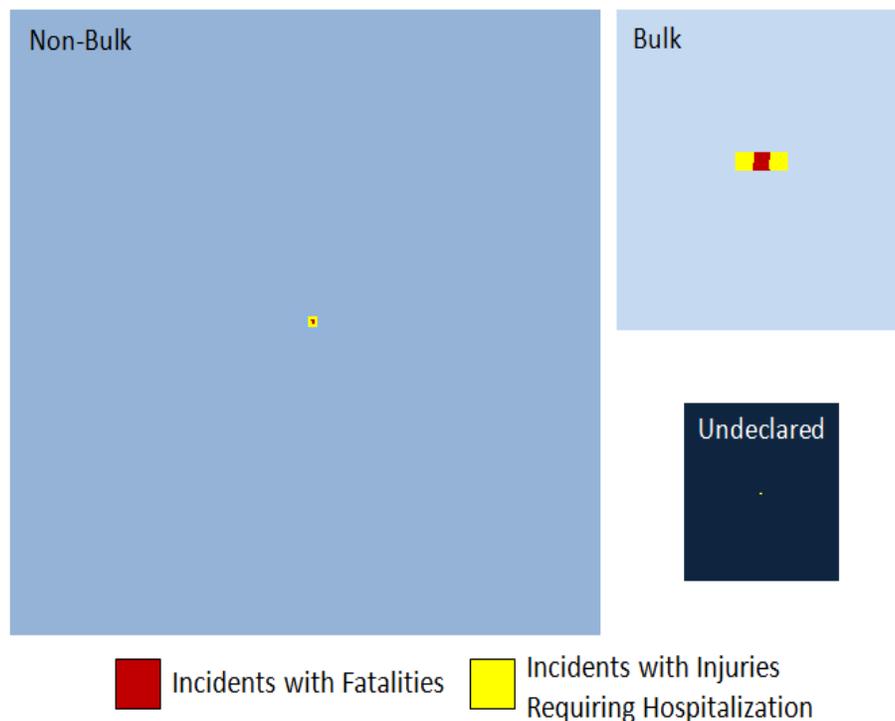
<sup>56</sup> Pipeline and Hazardous Materials Safety Administration, “Top Consequence Hazardous Materials Commodities,” No. 3”

(<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Hazmat/Top%20Consequence%20Hazardous%20Materials%20Commodities%20Report.pdf>, 1 September 2011). February 2013.

<sup>57</sup> U.S. Department of Transportation, “Departmentwide Program Evaluation of the Hazardous Materials Transportation Programs” ([http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/hmpe\\_execsum.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/hmpe_execsum.pdf), March 2000), p. 48. February 2013.

blue, broken down by bulk, non-bulk, and undeclared incidents. Incidents with fatalities are represented in red and incidents with hospitalizations are represented in yellow.

**Figure 11: Proportional Breakdown of Incidents by Bulk, Non-Bulk, and Undeclared (2001-2010)**



This figure highlights that the overwhelming majority of incidents that PHMSA collects are non-bulk. In addition, a small percentage of all reported incidents result in deaths and injuries, the majority of which involved bulk packages and very few of which involved undeclared incidents.

The exceptions found in the 49 CFR § 171.16 are an attempt to limit the reporting burden for materials and packages that have low risks when transported by a surface mode. However, numerous comments received from interested parties for this assessment and those interviewed within PHMSA suggest that the criteria for reporting should be changed to focus more on risks. This assessment agrees – especially for certain commodities transported in non-bulk packagings by ground that have historically had no consequential incidents.

**7.3.2 Who Should Report.** Reporting requirements state that the “person in physical possession of a hazardous material” when an incident occurs is required to submit the report. There has been much discussion during the rulemaking processes summarized in Chapter 3 as to who should report the incident. It was noted in the most recent final rule on reporting that “most commenters to the NPRM agree that the person in physical control of a hazardous material when an incident occurs during transportation should be responsible for reporting that incident.”<sup>58</sup>

<sup>58</sup> “Hazardous Materials: Revisions to Incident Reporting Requirements and the Hazardous Materials Incident Report Form, Final Rule.” *Federal Register* 68 (3 December 2003): p. 67750.

Generally, similar sentiments were shared in comments to this assessment from interested parties.

However, one commenter noted that the person performing the activity that caused the release should be required to report. While this seems equitable, difficulties with determining causation as well as self-reporting biases (discussed further below) make this requirement problematic.

Another commenter suggested that PHMSA should attempt to collect data from incidents that occur before the carrier arrives. This too is problematic since the product would not have yet been offered for transportation. The final rule clearly states that the reporting requirements are for “each person in physical control of a hazardous material while it is in transportation in commerce.”<sup>59</sup>

However, more accurate information can be obtained from supplementing data collection from others in the supply chain. For instance, shippers should be more familiar than carriers with packaging information, such as package manufacturer, closure instructions, and suppliers. Shippers are also generally made aware when products are not delivered to a consignee or if a consignee receives a product that was damaged in transport and needs to be replaced. Thus shippers and consignees can be valuable sources to verify incident report data or to bring unsafe conditions to appropriate authorities for investigation.

**7.3.3 Self-Reporting Bias.** Incomplete records, underreporting, and disproportionate reporting introduce bias to data that can adversely affect analyses and conclusions drawn from the data. The Data Quality Assessment of PHMSA’s data programs found:

“Underreporting and blank data fields are more serious than just *reducing the numbers*. It appears likely the reports and data we get are *not representative* of all the incidents that actually occur. When data gaps are not random, it can be misleading to draw general conclusions from the data we have. We rely heavily on the regulated industry to help us acquire information. This is convenient, and goes directly to the source. It also introduces a natural, inherent bias in the data we collect.”<sup>60</sup>

Self-reporting bias is possible whenever the group being studied or analyzed has any control over whether to participate. Datasets with self-reporting biases are often regarded as unscientific and unreliable for aiding decision-making.

Considering a company with safety or compliance problems may be less likely to self-report if reporting could expose the company to further scrutiny, there is anecdotal evidence that self-reporting bias exists.

---

([http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/68fr\\_2003/68fr-67745.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/68fr_2003/68fr-67745.pdf)) (accessed February 2013).

<sup>59</sup> Ibid, p. 30131.

<sup>60</sup>PHMSA, “A Data Quality Assessment, Evaluating the major safety data programs for pipeline and hazardous materials safety,” (November 10, 2009): p. 2.

(<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/DQA%20Report.pdf>) (accessed April 2013).

## **7.4 Adequacy of Resources**

The functional responsibilities related to data collection, analysis, and reporting are distributed among numerous divisions within PHMSA. To assess the adequacy of resources, spend plans and budget requests were reviewed and discussions were conducted with staff, managers, supervisors and advisors.

This assessment found that all the functions are being performed; however, the functions are distributed beyond the one responsible division in order to complete the collection, validation, assessment process.

At present, PHMSA has adequate resources to collect and process incident report data and maintain the status quo with all the limitations identified herein. In order to ensure further data accuracy, improve collection efficiencies and analytical capabilities, enhance and modernize information systems, or perform data governance roles, PHMSA may need to redirect and re-prioritize its current resources.

PHMSA's Data Quality Assessment highlights that risk analysis and program evaluation provide the *primary intelligence function* for managing and interpreting the data collected, program effectiveness and failures, and turning it into useful program information.<sup>61</sup> Being able to effectively conduct these activities is increasingly important as PHMSA aims to identify emerging risks and ensures its stellar safety record. These evaluation processes are usually the drivers for a wide range of other processes aimed at ensuring high quality data.

Over the past three years, PHMSA has taken steps to improve its analytical and evaluation capabilities and capacity through hiring of a few Presidential Management Fellows and an economist under its Chief Safety Officer CSO. OHMS' Program Development Division continues to rely some of its data collection and analysis on contractor support to conduct policy and program evaluations, regulatory assessments, and economic analyses. While this approach fills a short-term need, it does not develop and maintain needed expertise and skill gaps and could seriously limit PHMSA's ability to build a strong analytical capability and continuously improve data that are well-organized and easy to use for analysis. PHMSA's longer-term needs are addressed in the President's FY 2014 budget request.

## **7.5 Adequacy of the Database Used by the Administration and Other Users**

Over the past year (February 2012 to February 2013), there have been over 15,000 visits<sup>62</sup> to the incident reporting webpage and access to the databases used by PHMSA and others has become an important resource. However, numerous challenges exist for both data processors and users (external and internal) with PHMSA's databases – both HMIS and HIP. These challenges are highlighted below.

---

<sup>61</sup> PHMSA, "A Data Quality Assessment." p. 3.

<sup>62</sup> A visit is a series of actions that begins when a visitor views the first page from the server, and ends when the visitor leaves the site or remains idle beyond the idle-time limit. The default idle-time limit is thirty minutes.

**7.5.1 Insufficient Metadata.** Metadata is often referred to as “data about data” – it provides descriptive information about the context and content of the data. PHMSA does not provide sufficient metadata that can help analysts understand the limitations and usefulness of the data. Specifically, PHMSA does not provide: errata information when erroneous records are corrected; information on the changes that occurred with the data over time and the effects of these changes in the dataset; data quality standards used; field accuracy and completeness rates; or a description of the data model and tables formats.

**7.5.1 Online Reporting Tool.** The online report tool is part of the HMIS transaction system. Numerous comments were received pertaining to difficulties using the online reporting tool. PHMSA has been aware of many of these problems, but has not established methods to prioritize modifications and corrections. Specific issues that were identified include:

- One incident can result in the release of multiple commodities from multiple packages. However, the online reporting tool can only accept one commodity and one package for each incident. This problem has persisted since the tool was first introduced;
- The online reporting tool “timeouts” while a filer is entering data resulting in a loss of data that had already been entered; and
- Filers can submit duplicate reports – no validation is performed for uniqueness.

**7.5.2 Processing Challenges.** Business rules that have been embedded into the quality control processes in HMIS have actually resulted in inaccurate data or “force” data entry staff to supply information not submitted by the filer. This situation only exacerbates the issues of gleaning accurate and reliable analysis from incident data that has been highlighted throughout this chapter. Examples of these processing challenges include, but are not limited to:

- Fields do not accept *null* values. If the filer did not provide packaging markings, PHMSA must provide data such as “No markings given” in order to avoid processing errors;
- When the filer indicates that the cost of damages have exceeded \$500, but they cannot or will not estimate the dollar amount of the damages at the time that the initial report is filed, processing staff must select “No” for question #32 (*Was the total damages cost more than \$500*) in order to avoid an error message on the status/submit page in HMIS. When doing so, the filers must be contacted to inform them that they must submit a supplemental report once those figures have been determined;
- Failure codes submitted by filers may not be applicable or appropriate for certain packagings, but are accepted;
- Standard units of measure are not used. Filers can provide whatever unit of measure they deem appropriate;
- Filers can provide quantities that exceed the known capacity of a container;
- The commodities listed in the Hazardous Materials Table (49 CFR § 172.101) is not integrated with the HMIS and can result in erroneous entries;
- Terminology to describe non-standard packaging types is arbitrary and can complicate queries and analyses;
- Special permit and approval numbers provided by the filer are not cross-referenced with special permits and approvals databases; and

- During the submission of XML reports the following fields do not populate for the filer:
  - #34/ Injury indicator;
  - #28 Design pressure—unit of measure;
  - #28 Shell thickness—unit of measure;
  - #28 Head thickness—unit of measure; and
  - #28 Service pressure—unit of measure.

**7.5.3 Online Query Tool.** PHMSA has taken steps to make incident data more accessible. In 2008, PHMSA introduced an online query tool for users to access, review, and download hazardous material incident data from HIP.<sup>63</sup> Prior to this time, users could either download files that needed to be integrated or request information from PHMSA – most requested data specific to their needs.

The online reporting tool has eliminated hundreds of data requests each year and the need to maintain downloadable files. A depiction of the online query tool is provided in **Figure 12**. The online query tool is not without its shortcomings. A data dictionary is posted online, but it is difficult to find and is not readily associated with the query tool. In addition, no instructions or documentation on what data are available accompanies this tool and users are unaware of idiosyncrasies with the data and tool.

As a result, this assessment suspects that external users are not able to use this tool as often or as effectively as is possible. Examples of issues with this tool include:

- There is no explanation of the changes in reporting requirements and form DOT F 5800.1 over time – even though data are available back to 1971;
- Results of queries provide the number of incidents that occurred, however, the downloaded data most likely will have more records than incidents indicated. This is because the HMIS system is a relational database where one incident can have multiple package failures (i.e. one-to-many relationship). Thus, in order to provide all the pertinent data in a spreadsheet format, separate records are created for each package failure. This can be misinterpreted because users believe that more incidents occurred;
- Only a limited number of fields are available for query, so users need to download more data than needed and then sort fields that are of interest; and
- One search criteria is for “serious incidents” – this is a term no longer used by PHMSA since its definition could be misconstrued to mean “deaths or injuries.”

---

<sup>63</sup> Pipeline and Hazardous Materials Safety Administration, “Incident Reports Database Search,” (<https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/> 30 July 2008), (accessed February 2013).

**Figure 12: Online Hazardous Materials Incident Report Query Tool**

**PHMSA Office of Hazardous Materials Safety Incident Reports Database Search**  
PHMSA Hazmat Home

**Source: Hazmat Intelligence Portal, U.S.Department of Transportation. Data as of 2/21/2013.**

**PART II - GENERAL INCIDENT INFORMATION**

3. Date of Incident: From:  To:  (mm/dd/yyyy)

7. Location of Incident: City:  (begins) State:  Zip Code:  (contains)  
Incident Route:  (contains)

8. Mode of Transportation:  Air  Highway  Rail  Water  Other

9. Transportation Phase:  In Transit  Loading  Unloading  In Transit Storage

10. Carrier/Reporter: Name:  (contains)  
State:  Zip Code:  (contains)

11. Shipper/Offendor: Name:  (contains)

12. Origin: City:  (contains) State:  Zip Code:  (contains)

14. Proper Shipping Name of Hazardous Material:  (contains)

16. Hazardous Class/Division Code:  (begins) 17. Identification Number:  (contains)

**PART III - PACKAGING INFORMATION**

24. Packaging Type:  Non-Bulk  IBC  Cargo Tank Motor Vehicle (CTMV)  Tank Car  
 Cylinder  RAM  Portable Tank  Other

25. Incident Cause: What Failed:  (contains) How Failed:  (contains)  
Causes of Failure:  (contains)

**PART IV - CONSEQUENCES**

30. Result of Incident:  Spillage  Fire  Explosion  Material Entered Waterway/Storm Sewer  
 Vapor(Gas) Dispersion  Environmental Damage  No Release

33a. Did the hazardous material cause or contribute to a human fatality?  36. Was a major transportation artery or facility closed?

34. Did the hazardous material cause or contribute to personal injury?  37. Was the material involved in a crash or derailment?

35. Did the hazardous material cause or contribute to an evacuation?

**OTHER**

Report Number:  (contains) Serious Incident:

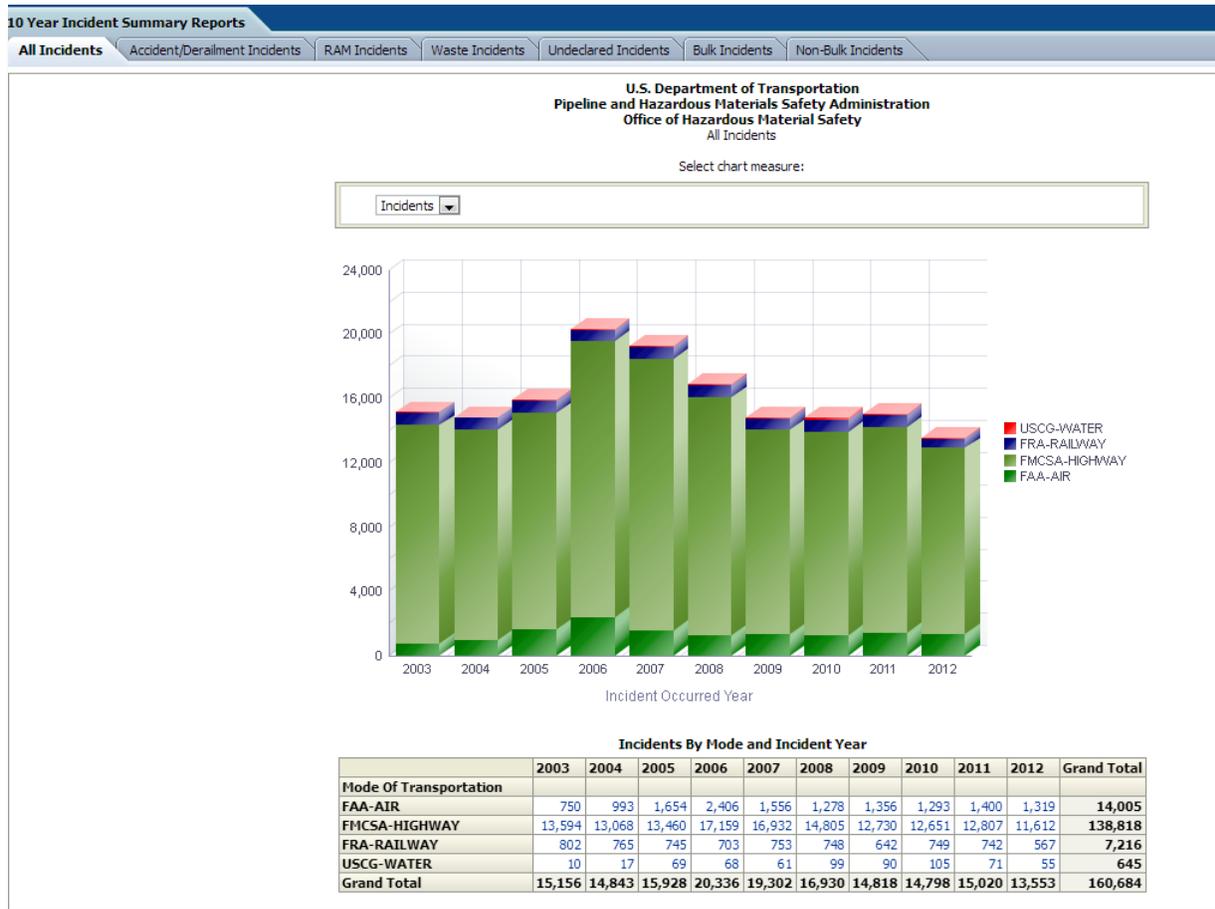
Container Code Detail:  (contains) Undeclared Shipment:

General Package Type:

**DISPLAY OPTIONS:** Display 50 results per page.

**7.5.5 Online Reports.** Incident statistics are located on PHMSA’s public website. This capability provides direct public access to HIP with interactive graphs and gives users the ability to “drill down” to view specific computer generated incident reports representative of the DOT F 5800.1. Data are updated each night and can be downloaded into Excel or PowerPoint. An example of one of the reports is provided below. Several comments received for this assessment indicate users would like additional reports. Many of the suggested reports already exist, but may be difficult to find.

**Figure 13: Summary of Incidents Reported (2003-2012) from PHMSA Public Website**



Source: Hazardous Materials Intelligence Portal, February 28, 2013

## 8. Recommendations

---

PHMSA should consider better alignment of its data collection with its operational needs. This can be accomplished by focusing data collection, processing, and analyses on those incidents that have harmed or have the greatest potential to harm people or the environment.

This assessment acknowledges that any changes to the reporting requirements and incident report form will require an open rulemaking process and must consider the costs and benefits of any changes made. [Additional analysis will be done to further inform any potential regulatory actions that may be recommended in this report.](#) Nevertheless, there are steps PHMSA can take to improve the quality and usefulness of the incident report data beyond regulatory and information collection changes. There are also costs associated with implementing these recommendations. These costs must be offset either through prioritizing resources or through the budget development process. However, this assessment does not monetize the recommendations contained herein.

### 8.1 Information Requested on the Incident

**8.1.1 Establish and Promulgate Standard Definitions. Definitions for terminology used in the incident report form needs to be developed.** While a current “data dictionary” is available, terms, words and phrases need to be defined and should be consistent with definitions used in the Department<sup>64</sup> and in some cases, other agencies. For example, PHMSA could use Occupational Safety and Health Administration’s definitions:

- ***Injury or illness.*** An injury or illness is an abnormal condition or disorder. Injuries include cases such as, but not limited to, a cut, fracture, sprain, or amputation. Illness includes both acute and chronic illnesses, such as, but not limited to, a skin disease, respiratory disorder, or poisoning. 29 CFR 1960.2(1).
- The word ***serious*** as used in ***serious hazard, serious violation*** or ***serious condition*** means a hazard, violation or condition such that there is a substantial probability that death or serious physical harm could result. 29 CFR 1960.2(w).

In other circumstances, PHMSA should provide examples. For instance, PHMSA can define “major transportation artery or facility” in 49 CFR § 171.15(b)(1)(iv) by providing examples such as interstate, state road, bridge, tunnel, rail corridor, rail yard, airport terminal, runway, transfer facility, and port.

Failure codes should to be revisited and those that are included on the form need to include clear definitions that are understandable, so that they are used consistently and appropriately.

**8.1.2 Tailor the Form Based on the Type and Mode of the Incident Reported. DOT F 5800.1 should be modified to have mode-specific sections to collect information needed by the modal administrations. The form should be developed to collect general information**

---

<sup>64</sup> A review conducted for the Department’s Safety Council found several different definitions of what constitutes a reportable injury among the operating administrations, the USCG, and NTSB.

**needed by all users, then direct filers to mode specific sections to collect information unique to the mode of transportation.** For instance, the USCG suggested that information on the conveyance/vessel would be helpful; FMCSA could use diagrams of cargo tanks and rail cars to identify where damage occurred; and tail numbers could help the FAA better identify specific aircraft involved in an incident.

The current form DOT F 5800.1 has a specific section for hazardous materials transported by air, but it does not have sections specific for rail, highway, or water.

It is anticipated that a new “smart form” would have a similar number of elements to be completed and the form would be longer when printed. However, filing using step-by-step electronic media could simplify reporting, reduce filer errors, and tailor data collection to specific situations.

One commenter suggested that required fields on the form should be specifically identified. This is not recommended since filers may be tempted only to submit required data even though more information is available.

**8.1.3 New Data Fields. Additional information can help PHMSA improve data quality and aid in the verification and validation reported information. The following information should be collected:**

- Whether the shipment was placarded and the type of placards displayed – this will aid in determining compliance with placarding and hazmat registration requirements and serves as an indicator of increased risk;
- Contact information for Fire, Emergency Management Services, Police, and clean-up remediators – allows follow up for verification/validation and support investigations;<sup>65</sup>
- Certification that the information provided on the report is correct and true – this will help improve data quality and support enforcement;
- Criteria that triggered the submission of the report from 49 CFR §§ 171.15 and 171.16 (e.g., what event(s) occurred that precipitated the filing of the report); and
- Data specific for aerosols and batteries.<sup>66</sup>

**8.1.4 Reexamine Failure Codes. Failure codes need to be revisited to provide accurate, reliable, and verifiable data. At a minimum, the following changes to the failure codes will increase the likelihood that factual causation information is provided by filers and that the information is reliable:**

- Each descriptive term and phrase on the DOT F 5800.1 should have a corresponding definition the filer can access when reporting an incident to ensure accurate failure descriptions are selected;

---

<sup>65</sup> This information is collected as part of follow-up investigation; collecting this on the form would improve the ability of PHMSA and others conduct more thorough follow-ups in a timely manner.

<sup>66</sup>“Assessment of Hazardous Materials Incident Data Collection, Analysis, Reporting, and Use” (<http://www.regulations.gov/#!docketDetail:D=PHMSA-2012-0301>, 6 February 2013), February 2013. These comments are specifically from American Trucking Association and Alaska Airlines.

- PHMSA should consider eliminating the need for a filer to look up failure codes when reporting, but rather, have the option to choose the appropriate codes through a drop down screen. In addition, filers should be given an option to check “all that apply”;
- If the form is modified to include specific modal sections, only failure descriptions specific to the mode should be available for selection; and
- The following “causes of failure” terms are subjective and should be removed or revised to provide useful, meaningful, and reliable data: human error; inadequate accident damage protection; inadequate maintenance; inadequate preparation for transportation; inadequate procedures; inadequate training; incompatible product; and misaligned product.

**8.1.5 Eliminate Certain Fields. Certain fields can be eliminated because they can be collected or derived from other sources, are rarely used by the agency to verify information, or provide little useful data to support safety or policy analyses. These data fields include:**

- The TIH indicator can be determined by the United Nations (UN) number and proper shipping name;
- Federal DOT agency name and Federal DOT report number are infrequently reported and rarely used;
- Shipper Hazardous Material Registration number – this number is not required to be provided to the carrier and can be obtained directly from the shipper during the verification process or matched using data within HIP;
- Technical trade name is rarely (if ever) used in safety or policy analyses;
- Hazmat Waste EPA number can be collected from the waste manifest; and
- Other cleanup indicated is rarely used.

**8.1.6 Certification of Accuracy and Completeness. PHMSA should require incident report filers to certify that the information they submit is accurate and complete.**

## ***8.2 Methods Used by PHMSA to Verify Accuracy and Completeness***

PHMSA needs to build upon its current quality control processes to establish a more robust approach for verifying and validating incident data. Current processes rely heavily on internal resources to investigate and collect information to validate incident reports. Accuracy and completeness can be improved by: expanding current validation processes to include additional data sources; conducting additional investigations; incorporating results from internal and external investigations; and increasing the awareness of the reporting requirements.

**8.2.1 Verification Methods Documentation and Training. PHMSA needs better documentation on its verification and validation methods.** A more systematic verification and validation approach documented in a manual and guide would ensure consistent methods are used. The manual and guide should include methods already used along with recommendations contained herein.

Additionally, PHMSA staff and contractors need training in verification methods.

**8.2.2 Prioritize Internal Validation Based on Severity. Continue to have verification and validation of incidents with high consequence incidents a priority.** PHMSA’s efforts to verify and validate incidents resulting in deaths and injuries have provided the agency with additional insight into the causes of these high consequence events. If possible, this verification and validation process should be expanded to target other high consequence events (e.g., evacuations and major transportation disruptions) as well. This will also help PHMSA determine the level of verification and validation needed for all incidents.

**8.2.3 Cross Reference Data. PHMSA should continue to expand its compliance review of reporting requirements and data accuracy.** Data are available from other sources that can be used to identify incidents that have not been reported as well as validate information that has been collected.

Specifically, PHMSA should explore integrating data from the following sources with data in HIP:

- National Highway Transportation Safety Administration’s (NHTSA) Fatality Analysis Reporting System (FARS) collects data regarding fatal injuries suffered in motor vehicle traffic crashes. Fatal incidents involving hazardous materials are also collected and can be cross referenced with incidents involving a hazardous material in HIP since information is collected on date, location, placard, and UN number, thus providing a means to improve reliability of incident report data involving fatalities.
- FRA collects information from accidents, incidents and injuries using the Rail Equipment Accident/Incident Reports (RAIRS) system. Requirements for the FRA reporting requirements are found in 49 CFR § 225.19. The RAIRS system collects information from all types of rail incidents – not just those involving hazardous materials. Thus only a subset of RAIRS data would need to be integrated. Since RAIRS provides additional information on the type of accident/incident, number of rail cars damaged, type/specification of equipment, and location in the consist, the data can be used to provide additional insight into an incident as well as identify incidents that need to be reported.

**8.2.4 Investigations. Link modal incident investigation information with information PHMSA collects through the DOT F 5800.1.** PHMSA and modal administrations often conduct investigations following an incident to identify violations of regulations and causes of failure. Currently information from these reports are not linked to information collected on the DOT F 5800.1 form, making it difficult for both PHMSA and DOT modes to use this supplemental information in analyses.

**In addition, NTSB reports should be used to supplement and correct incident report data.** The NTSB is an independent Federal agency charged by Congress to investigate every civil aviation accident in the United States and significant accidents in the other modes of transportation—highway, marine, pipeline, and railroad—and issue safety recommendations intended to prevent future accidents. Reports summarizing NTSB findings provide noteworthy causation and consequence information.

**8.2.5 Verify Information from Others in the Supply Chain. Establish a pilot study to verify packaging information by contacting shippers.** PHMSA should also use its authority to conduct special studies to send shippers of record requests to verify the packaging information. In addition, incident reports missing packaging information should be sent to the shipper to complete the form as part of the pilot study.

Information provided on an incident report form is typically from one source – the filer – who is typically the carrier. Information on the type of packaging involved in an incident can best be collected from the shipper who prepared the package for transportation. Shippers purchase, or in some cases fabricate, the packaging used and can provide information on the packaging type, manufacturer, manufacturer date, package testing information, packaging and closure instructions, material of construction, number of packages shipped, container capacity, service pressure, etc. Shippers can also verify or validate that the commodity information submitted by the filer is correct and provide additional or missing information such as origin and destination of the shipment and product value –thus improving overall quality and usefulness of the data.

By contacting shippers to provide information on incidents occurring with their products, they would have greater visibility and increased awareness of incidents. Thus, they will have information to make informed business decisions pertaining to packaging and carrier selection.

PHMSA could also conduct special studies of certain packagings by contacting package manufacturers and suppliers.

**8.2.6 Establish Standardized Procedures for Revising and Updating Data. Incident data contained with HIP should contain the most accurate and correct data on an incident and users need to be able to determine the sources of the information and to recommend corrections if errors are found.**

Incidents in HIP need to be viewed not only as a repository for form DOT F 5800.1, but as the trusted source of incident data. When corrected or new information and data pertaining to an incident is available, standardized operating procedures need to be developed and published governing how changes and corrections are made and documented.

When analysts and incident data users identify problems and issues with data, there needs to be a mechanism to provide feedback to make corrections in order to improve the data for future analyses.

**8.2.7 Electronic Submissions. PHMSA should consider requiring filers to submit reports electronically.** Electronic reporting can increase completion rates of data fields, reduce the likelihood of errors, improve quality control measures, increase the efficiency of data processing, and reduce overall costs to industry and the government.

Such a requirement is not without precedence. Numerous agencies have established electronic submission requirements for companies that transact with them. The Internal Revenue Service requires tax preparation companies to submit electronic files; the EPA requires industrial facilities to use the Electronic Reporting Tool for submission of emissions data; the Food and Drug Administration requires manufacturers, importers, and user facilities to submit medical

device reports electronically; and all agencies, including PHMSA, require electronic submission of grant applications.

**8.2.8 Reporting Outreach, Training, and Enforcement.** PHMSA should continue to develop outreach and training materials to encourage compliance with the reporting requirements and assist filers with understanding the purpose of the requirements, the importance of providing accurate information, instructions on how to comply, and where they can get assistance.

To increase awareness, PHMSA should maintain an online search tool of potentially reportable incidents and invite anyone who has knowledge of an incident to provide additional details. In 2009, when USA Today published a list of potentially reportable incidents in conjunction with an article pertaining to under-reporting, PHMSA received numerous inquiries on the reporting requirements and why certain companies were on the list.<sup>67</sup>

Finally, PHMSA should also recognize that reliable and consistent reporting of incidents can serve as a strong indicator of a good safety program within a company; conversely, the absence of reporting or the reporting of only serious incidents can serve as an indicator for a deficient safety program.

### ***8.3 Reporting Requirements***

PHMSA's Strategic Plan states that its goal is to reduce the risk of harm to people due to the transportation of hazardous materials, focusing especially on preventing high risk events.<sup>68</sup> However, a review of incident data indicates the majority of PHMSA's data collection over 40 years includes incidents involving non-bulk packaging that could not have escalated into a high consequence event. This is because hazards present at an incident involving most non-bulk packaging that occur during loading, at in-transit storage, in sorting facilities, and during unloading can be successfully mitigated. In addition, most of these incidents occur due to human error such as improper handling of the package not because the package was incapable of withstanding the rigors of transportation. Based on analysis of data from HIP, this assessment found that incidents involving bulk packagings comprise less than 20% of reported incidents yet account for more than 95% of incidents with a fatality.

**8.3.1 Applicability of Reporting Requirements.** PHMSA should continue to collect information from those who have physical possession of the material at the time an incident occurs.

Others in the supply chain should be used to validate information as needed.

**8.3.2 Establish Standard Definitions.** Terminology used in the reporting requirements needs to be clear and understandable. Specifically, clarification is needed as to what is considered a "major transportation artery or facility" – this can be accomplished by providing a

---

<sup>67</sup> Peter Eisler, "'Serious' Hazmat Spills Not Reported," USA Today, 9 September 2009. [http://usatoday30.usatoday.com/news/nation/2009-09-08-hazmat\\_N.htm](http://usatoday30.usatoday.com/news/nation/2009-09-08-hazmat_N.htm) (accessed March 2013)

<sup>68</sup> PHMSA, "2012-2016 Strategic Plan."

definition in 49 CFR § 171.8 or providing examples with the requirement. “Minimal amount” found in 49 CFR § 171.16(d)(1)(i), referring to an exception for venting, should be defined. Similarly, there has been confusion by what is meant by “breakage” for radioactive materials in 49 CFR § 171.15(b)(2). Through both interviews and the American Trucking Association petition for rulemaking, it has been recommended that this term be deleted from the sentence.<sup>69</sup>

**8.3.3 Risk-based Reporting Requirements. PHMSA should change the reporting requirements found in 49 CFR § 171.16 to focus incident data collections on the basis of risks.** This can be accomplished by focusing data collection, processing, and analyses on those incidents which have the greatest risk to safety and the environment. PHMSA should change the reporting requirements found in 49 CFR § 171.16 to focus incident data collections on the basis of risks and specifically on materials and modes that have a higher probability of resulting in high and very high consequence events. The revised reporting requirements should be easy to understand and comply with. The following conditions should be met in order to file a DOT F 5800.1:

- Any circumstance set forth in 49 CFR § 171.15(b);
- Any unintentional release of a hazardous material or the discharge of any quantity of hazardous waste during the course of transportation in commerce by air and water (including loading, movement, unloading, and temporary storage);
- Any unintentional release of a hazardous material or the discharge of any quantity of hazardous waste during the course of transportation in commerce (including loading, movement, unloading, transloading, and temporary storage) from a bulk packaging or intermediate bulk container as defined in 49 CFR §171.8. *Exceptions:* A release of a minimal amount of material from—a vent, for materials for which venting is authorized; the routine operation of a seal, pump, compressor, or valve; or connection or disconnection of loading or unloading lines, provided that the release does not result in property damage;
- Damage to a cargo tank. A specification cargo tank with a capacity of 1,000 gallons or greater containing any hazardous material suffers structural damage to the lading retention system or damage that requires repair to a system intended to protect the lading retention system, even if there is no release of hazardous material;
- Any unintentional release of a Class 1, Class 2, Division 6.1, Class 7 or Packaging Group I (PGI) material from non-bulk packaging as defined in 49 CFR §171.8;
- Any discovery of an undeclared hazardous material. *Exception:* An undeclared hazardous material discovered in an air passenger's checked or carry-on baggage during the airport screening process. (For discrepancy reporting by carriers, see §175.31 of this subchapter); and
- Battery or battery powered devices. A fire, violent rupture, explosion or dangerous evolution of heat (i.e., an amount of heat sufficient to be dangerous to packaging or personal safety to include charring of packaging, melting of packaging, scorching of packaging, or other evidence) occurs as a direct result of a battery or battery-powered

---

<sup>69</sup>American Trucking Association, “Petition for Rulemaking – Incident Reporting Requirements,” (<http://www.regulations.gov/#!docketDetail;D=PHMSA-2010-0207>, 2 July 2010). (accessed February 2013)

device when in transportation in commerce (including loading, movement, unloading, and temporary storage).

An analysis of all incident reports submitted from 2005 through 2012 using the criteria presented above found that there would be approximately a 55% reduction in incident report submissions if the criteria were in use – all were non-bulk by highway. Of those that would not have meet submission requirements, none involved in a fatality and 0.99977 did not involve a serious injury. The serious injuries that were reported were primarily the result of mishandling the package (e.g., drops, fork lift punctures, and improper blocking and bracing) or vehicular accidents. However, these incidents would still be reported since they meet the reporting requirements found in 49 CFR § 171.15(b).

In addition, the criteria would also address comments received from interested parties for this assessment as well as petitions for rulemaking from the American Trucking Associations and the National Paint and Coatings Association, a summary of which can be found in **Appendix D**.

**8.3.4 Additional Time to Submit Reports. Filers that report incidents meeting criteria found in 49 CFR § 171.15(b) who need additional time to collect and provide correct information should be permitted to file for an extension of up to 90 days provided that certain information is initially submitted.** This initial submission at a minimum should include carrier and shipper information; commodities involved; mode of transportation; type of packaging or vehicle involved; date and time; location; emergency response contacts; a brief description; and significant consequences such as deaths, injuries, and any major disruption caused by the incident.

The reasoning behind this recommendation is that comments received by the Association of American Railroads for this assessment and numerous comments discussed in past rulemakings suggest that the requirement to submit the DOT F 5800.1 should be longer than 30 days. It is suggested that some incidents require additional time to gather correct and accurate information. While there are provisions that exist for filers to provide supplemental information, current procedures and limitations with PHMSA's online submissions make this difficult.

**8.3.5 Theft or Loss of Certain Hazardous Materials. PHMSA should conduct a study to determine whether collecting information on the theft or loss of certain hazardous materials can improve the Department's understanding of the threats associated with stolen or lost materials.** The study should determine the effectiveness of using such information to assess security plans required by the HMR and explore if theft or loss information is already available from other sources.

## ***8.4 Resources***

Changes recommended to the reporting requirements should reduce the number of incident reports received for low consequence events and will allow reallocation of resources to implement other recommendations, such as verifying information from others in the supply chain. However, PHMSA will need to weigh its priorities against its limited resources to implement the recommendations herein.

**8.4.1 Improve a Data Governance Capability.** PHMSA should improve its data government processes and procedures to specify how decisions are made to manage and handle data, how information resources are allocated based on risks, and how accountability for results is measured and tracked. The initial step in the implementation of a data governance program involves the establishment of an oversight board or council that provides executive direction on the management of metadata, master / trusted data, data quality, and data accessibility and security.

**8.4.2 Assign Dedicated Staff for Data Management and Analysis.** PHMSA should designate a Data Manager for hazardous materials incident data and assign staff dedicated for analyzing collected information. Developing staff that is knowledgeable in the idiosyncrasies and characteristics of the data requires time and training. Contingency plans and cross-training are essential to ensure operations are efficient, effective, and robust.

**8.4.3 IT Modernization.** PHMSA should reassess its IT Modernization Sequencing Plan, given the recommendations to change the reporting requirements and DOT F 5800.1. It is also recommended that the IT Modernization Plan be updated to include integrating additional data sources such as FARS and RAIRS.

## ***8.5 Database Used by the Administration and Other Users***

Changes to the database and IT systems will be challenging and need to be implemented in a systematic and iterative approach. PHMSA's current strategy of maintaining existing systems and replacing them as the IT Modernization Plan is implemented should continue. Improvements to or replacements of the online reporting and query tools, processing capabilities, and summary reports need to be closely coordinated with any changes to the reporting requirements and DOT F 5800.1. However, this does not mean short-term enhancements cannot be made.

**8.5.1 Consolidate Incident Data Query Tools, Reports, and Supporting Metadata.** All information related to incident reports should be accessible from a single PHMSA webpage to include reports, pamphlets, data dictionaries, reports, etc. – create a “one-stop-shop” for incident reports. Users should be able to make suggestions to improve the services available from the webpage. A list, description, and link should be available for each available report.

Metadata for the incident reporting database needs to be available for users and analysts. This should include a description of the data, a summary of where the data comes from, analyses of completeness, relationship to other data used by PHMSA, and other information on the data that will ensure its proper use.

**8.5.2 Expand Search Capabilities.** Add keyword search functionality to both incident report and incident on-line query tool. The ability to search for specific or similar incidents is dependent upon how easily the data can be searched. A simple and commonly used approach is to establish a keyword search capability. Keywords need to be easily added and associated with incidents; while it is impractical to retroactively assign keywords to all reports, they can be added as analyses are conducted. For example, all incidents that were determined to involve the undercarriage piping of a cargo tank should be associated with the keyword “wetlines.”

One of the most valuable fields that should be searchable is the description section of the report. Commenters also suggested that incidents involving Special Permits and Approvals should be searchable with the online tool.

Users need to be able to produce a computer generated DOT F 5800.1 from the Online Query Tool.

**8.5.3 Redesign and Replace Online Reporting Tool.** As part of the IT Modernization, the online reporting tool should be replaced to address both processing and user issues identified above in Chapter 7 and to establish a “smart form” that provides a step-wise functionality. This cannot be accomplished until the DOT F 5800.1 is modified.

## 9. Action Plan

---

Based on this assessment, PHMSA has developed the following action plan with the goal of improving the collection, analysis, reporting, and use of hazardous materials incident data. Several recommendations contained in this assessment can be acted upon by prioritizing and focusing staff activities and workload. However, some actions require resources that have not been previously planned for, allocated, authorized, or appropriated. Actions with budgetary implications do not have a specified timeframe for completion.

<b>Action Item</b>	<b>Actions</b>	<b>Timeline</b>
<b>Cost Analysis and Resource Planning</b>	Estimate action plan costs and develop a financial and budget plan	First Quarter FY14
<b>Update reporting requirements and report form</b>	<p>Conduct and complete a policy analysis on the merits of a regulatory change to revise the reporting requirements and DOT F 5800.1 based on the recommendations contained herein</p> <p>Host public meeting(s) during the comment period to solicit additional comments from interested parties</p>	<p>FY14 – based on Department’s regulatory priorities</p> <p>As appropriate and based upon availability of funds</p>
<b>Improve data governance and management</b>	<p>Develop a charter for a data governance panel for hazardous materials data. The panel will be comprised of representatives from PHMSA’s CSO, CIO, and Hazardous Materials Program Development Division</p> <p>Designate a Hazardous Materials Safety Data Manager with primary responsibility for incident data</p> <p>Establish Quality Standards for Hazardous Materials incident data</p> <p>Re-establish the HIP steering committee</p>	<p>First Quarter FY14</p> <p>First Quarter FY14</p> <p>Second Quarter FY14</p> <p>First Quarter FY14</p>
<b>Enhance hazardous materials incident data verification and validation (V&amp;V) program</b>	<p>Compile all methods currently used to verify and validate into a single manual</p> <p>Develop Standard Operating Procedures for correcting and amending incident</p>	<p>First Quarter FY14</p> <p>Second Quarter FY14</p>

	<p>reports when new or more accurate information is received</p> <p>Train staff and contractors on the V&amp;V procedures</p> <p>Establish criteria when additional information should be from others in the supply chain (e.g., package manufacturers, suppliers, shippers, consignees, etc.) – see pilot study below</p> <p>Develop a roadmap for integrating additional data sources into the V&amp;V process</p>	<p>Second Quarter FY14</p> <p>Third Quarter FY14</p> <p>Third Quarter FY14</p>
<b>Improve compliance with incident reporting requirements</b>	<p>Establish procedures to consistently enforce the incident reporting requirements</p> <p>Develop training materials on incident reporting requirements and how to complete an incident report</p>	<p>Fourth Quarter FY13</p> <p>TBD</p>
<b>Modernize information systems</b>	<p>Develop a keyword search capability for the online query</p> <p>Redesign and replace online reporting tool with a “smart form”</p>	<p>To be determined (TBD)</p> <p>TBD</p>
<b>Website</b>	<p>Consolidate all incident report queries, tools, and documentation in a central location – provide lists, descriptions, and links to of available reports</p> <p>Establish methods for users to provide feedback and suggestions for improvements</p>	<p>First Quarter FY14</p> <p>TBD</p>
<b>Research and Analysis</b>	<p>Conduct pilot study requesting packaging data from shippers using authority in 49 CFR § 171.21</p> <p>Monitor Transportation Research Board’s study on de minimis hazardous materials shipments</p>	<p>TBD</p> <p>FY14</p>

--	--	--

# Appendix A: Bibliography

- American Coatings Association. 29 July, 2010. "Petition for Rulemaking; Proposed Amendment to the Requirement for Incident Reporting in Order to Collect Meaningful Incident Data." <http://www.regulations.gov#!docketDetail;D=PHMSA-2010-0225>.
- American Trucking Association. 2 July 2010. "Petition for Rulemaking – Incident Reporting Requirements." <http://www.regulations.gov#!docketDetail;D=PHMSA-2010-0207>.
- "Assessment of Hazardous Materials Incident Data Collection, Analysis, Reporting, and Use." *Federal Register* 77 (21 November 2012). <http://www.regulations.gov#!documentDetail;D=PHMSA-2012-0301-0001> (accessed February 2013).
- "Detailed Hazardous Materials Incident Reports, Final Rule." *Federal Register* 54 (19 June 1989). [http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/54\\_FR\\_25808.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/54_FR_25808.pdf) (accessed January 2013).
- DOT Order 1100.74A. 30 September 2010. *Department of Transportation Organizational Manual Pipeline and Hazardous Safety Administration*.
- "Elimination of Certain Reporting Requirements, Final Rule." *Federal Register* 45 (6 Nov. 1980). [http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/45fr\\_1980/45fr-73682.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/45fr_1980/45fr-73682.pdf) (accessed January 2013).
- "Elimination of Certain Reporting Requirements, Notice of Proposed Rulemaking." *Federal Register* 45 (16 July. 1980). [http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/45fr\\_1980/45fr-40628.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/45fr_1980/45fr-40628.pdf) (accessed January 2013).
- "Hazardous Materials in Intrastate Commerce and Improvements to Hazardous Materials Identification Systems, Final Rule." *Federal Register* 62 (8 January 1997). [http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/62fr\\_1997/62fr-1208.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/62fr_1997/62fr-1208.pdf) (accessed January 2013).
- "Hazardous Materials: Revisions to Incident Reporting Requirements and the Hazardous Materials Incident Report Form, Correction, Final Rule." *Federal Register* 69 (26 May 2004). <http://www.gpo.gov/fdsys/pkg/FR-2004-05-26/html/04-11398.htm> (accessed January 2013).
- "Hazardous Materials: Revision to Requirements for the Transportation of Batteries and Battery-Powered Devices; and Harmonization with the United Nations

Recommendations, International Maritime Dangerous Goods Code, and International Civil Aviation Organization's Technical Instructions, Final Rule." *Federal Register* 74 (14 January 2009). <http://www.gpo.gov/fdsys/pkg/FR-2009-01-14/pdf/E8-31383.pdf> (accessed January 2013).

Hazmat Intelligence Portal. <https://hip.phmsa.dot.gov/EntryWeb/default.htm>

Juran, J.M., and A.B. Godfrey. 1999. *Juran's Quality Handbook*, 5<sup>th</sup> ed. New York: McGraw-Hill

National Response Center. 31 January 2001. "NRC Background."  
<http://www.nrc.uscg.mil/nrcback.html>.

Office of Management and Budget. September 2006. "Standards and Guidelines for Statistical Surveys."  
[http://www.whitehouse.gov/sites/default/files/omb/inforeg/statpolicy/standards\\_stat\\_surveys.pdf](http://www.whitehouse.gov/sites/default/files/omb/inforeg/statpolicy/standards_stat_surveys.pdf).

"Performance-Oriented Packaging Standards, Changes to Classification, Hazard Communication, Packaging and Handling Requirements Based on UN Standards and Agency Initiative, Final Rule." *Federal Register* 55 (21 December 1990).  
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/55fr\\_1990/55fr-52402.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/55fr_1990/55fr-52402.pdf) (accessed on January 2013).

Phimister, J.R., and U. Oktem, P. Kleindorfer, and H. Kunreuter. Near-Miss Incident Management Systems in the Chemical Process Industry. (2003) *Risk Analysis*. 23; pp. 445-459. <http://opim.wharton.upenn.edu/risk/downloads/03-01-JP.pdf> (accessed February 2013).

Pipeline and Hazardous Materials Safety Administration. 11 May 2007. "Estimating the Extent of Under-Reporting of Hazmat Incidents, Preliminary Findings." Internal Document.

Pipeline and Hazardous Materials Safety Administration. 10 November 2009. "Evaluating the Major Safety Data Programs for Pipeline and Hazardous Materials Safety."  
<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/DQA%20Report.pdf>.

Pipeline and Hazardous Materials Safety Administration. 19 November 2004. "Hazardous Materials Incident Report."  
<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/IncidentForm010105.pdf>.

Pipeline and Hazardous Materials Safety Administration. 2008. "Incident Reports Database Search." <https://hazmatonline.phmsa.dot.gov/IncidentReportsSearch/>.

- Pipeline and Hazardous Materials Safety Administration. 2012. "PHMSA Strategic Plan 2012-2016."  
<http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/PHMSA%20Strategic%20Plan%20Final%208%203%2012.pdf>.
- Pipeline and Hazardous Materials Safety Administration. 1 September 2011. "Top Consequence Hazardous Materials Commodities," No. 3.  
<http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Hazmat/Top%20Consequence%20Hazardous%20Materials%20Commodities%20Report.pdf>.
- Pipeline Hazardous Materials Safety Administration, Office of Hazardous Materials Safety. September 2008. "A Closer Look at Who's Reporting Hazardous Materials Incidents 2000 2005." Internal PHMSA Document.
- Pipeline Hazardous Materials Safety Administration, Office of Hazardous Materials Safety. October 2009. "Special Permits Standard Operating Procedures."  
<http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Hazmat/Special%20Permits%20Standard%20Operating%20Procedures%20Version%201.0.pdf>
- Pipeline Hazardous Materials Safety Administration, Office of Hazardous Materials Safety. October 2010. "Data Quality and Improvement Plan." Internal OHMS Document.
- "Radioactive Materials Reporting Requirements, Final Rule." *Federal Register* 36 (4 Nov. 1971).  
[http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/36fr\\_1971/36fr-21200.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/36fr_1971/36fr-21200.pdf) (accessed January 2013).
- "Reports of Hazardous Materials Incidents, Final Rule." *Federal Register* 35 (31 Oct. 1970).  
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/35fr\\_1970/35fr-16836.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/35fr_1970/35fr-16836.pdf) (accessed January 2013).
- "Reports of Hazardous Materials Incidents, Proposed Rulemaking." *Federal Register* 34 (29 Oct. 1969).  
[http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/34fr\\_1969/34fr-17450.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/Federal%20Register%20Historical%20Files/34fr_1969/34fr-17450.pdf) (accessed January 2013)
- Research and Special Programs Administration. 1989. "Annual Report on Hazardous Materials Transportation." OHMS Archive Document.
- Research and Special Programs Administration. "Biennial Report on Hazardous Materials Transportation, Calendar Years 1994 – 1995."  
[http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/94\\_95biennial\\_report.pdf](http://www.phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/94_95biennial_report.pdf) (accessed January 2013)

- Research and Special Programs Administration, Office of Hazardous Materials Safety. 29 October 1998. "Hazardous Materials Information System (HMIS) Incident Reporting Subsystem Review." Internal PHMSA Document.
- Transportation Research Board, Hazardous Materials Cooperatives Research Program. 2009. "Report 1: Hazardous Materials Transportation Incident Data for Root Cause Analysis." [http://onlinepubs.trb.org/onlinepubs/hmcrp/hmcrp\\_rpt\\_001.pdf](http://onlinepubs.trb.org/onlinepubs/hmcrp/hmcrp_rpt_001.pdf)
- U.S. Congress, Office of Technology Assessment (OTA). 1986. *Transportation of Hazardous Material*, 99<sup>th</sup> Congress, 2<sup>nd</sup> sess., July.
- U.S. Department of Transportation. 2011. "Annual Performance Report: PHMSA Data Completeness and Reliability." [http://www.dot.gov/sites/dot.dev/files/docs/dot\\_annual\\_performance\\_report\\_fy\\_2011.pdf](http://www.dot.gov/sites/dot.dev/files/docs/dot_annual_performance_report_fy_2011.pdf)
- U.S. Department of Transportation. March 2000. "Department wide Program Evaluation of the Hazardous Materials Transportation Programs." [http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/hmpe\\_execsum.pdf](http://phmsa.dot.gov/staticfiles/PHMSA/DownloadableFiles/Files/hmpe_execsum.pdf)
- U.S. Department of Transportation. July 1971. "First Annual Report of the Secretary of Transportation on Hazardous Materials Control." OHMS Archive Document.
- U.S. Department of Transportation. 1980. "Fourteenth Annual Report of the Secretary of Transportation on Hazardous Materials Control." OHMS Archive Document.
- U.S. Department of Transportation. 1976. "Seventh Annual Report of the Secretary of Transportation on Hazardous Materials Control." OHMS Archive Document.
- U.S. House of Representatives Committee on Transportation and Infrastructure. 2009. *Concerns with Hazardous Materials Safety in the U.S.: Is PHMSA Performing its Mission?*, 111<sup>th</sup> Cong., 1<sup>st</sup> sess., 10 September 2009.
- U.S. House of Representatives Committee on Transportation and Infrastructure. 2010. *The Department of Transportation's Oversight and Management of Hazardous Materials Special Permits and Approvals*, 111<sup>th</sup> Cong., 2<sup>nd</sup> sess., 21 April.
- U.S. Public Law 112-141. 112<sup>th</sup> Cong., 2<sup>nd</sup> sess., 6 July. *An Act to Authorize Funds for Federal-aid Highways, Highway Safety Program, and Transit Program, and for Other Purposes*
- The Wharton School of Management, University of Pennsylvania. Risk Management and Decision Processes Center. (2013). <http://www.wharton.upenn.edu/riskcenter/nearmiss.cfm> (accessed March 2013).

# Appendix B: Overview of Comments

On November 21, 2012, PHMSA posted a notice in the Federal Register soliciting “comments and information to be used for an assessment to improve the collection, analysis, reporting, and use of data related to accident and incidents involving the transportation of hazardous materials.” Comments were to be received by December 8, 2012.<sup>70</sup> PHMSA accepted comments after the comment period closed to ensure all submissions were considered for the assessment. This Appendix outlines the comments received from this request.<sup>71</sup>

## Alaska Airlines

- Questions whether DOT F 5800.1 is the best method to collect undeclared hazmat information
- Notes online tool does not accept multiple HM commodities/packages
- Recommends acceptance of Post Office boxes – no recognized streets in some parts of Alaska
- States DOT F 5800.1 not designed to capture battery information

## American Coatings Association, Inc.

- Recommends changes to failure codes – suggest specific codes be eliminated to remove subjectivity
- Suggests eliminating collection of data on low risk shipments – referred to petition requesting broader exceptions
- Expresses concern that shippers unaware of incidents and noted that it is very difficult for shippers to conduct timely investigations

## American Trucking Associations

- Recommends research on magnitude and cause of underreporting
- Suggests examining fields – determine which are necessary and which are extraneous and can be removed
- Suggests PHMSA should consider whether incidents should be reported before carrier arrives
- Advocates PHMSA preempting state and local reporting requirements
- Recommends expanding exceptions for Class 3 materials to include PGII materials, raise reporting threshold quantity to 29 gallons from 5.2 gallons
- Recommends working with Nuclear Regulatory Commission to eliminate duplicative reporting
- Identifies problems with online tool timing-out
- Suggests improvements to form – multi-package releases; additional failure codes for batteries and aerosols; stop collecting trade names; removal of destination, product value,

---

<sup>70</sup> “Assessment of Hazardous Materials Incident Data Collection, Analysis, Reporting, and Use,” *Federal Register* 77 (21 November 2012): pp. 69925-69926. <http://www.regulations.gov/#!documentDetail;D=PHMSA-2012-0301-0001> (accessed February 2013).

<sup>71</sup> “Assessment of Hazardous Materials Incident Data Collection, Analysis, Reporting, and Use”. <http://www.regulations.gov/#!docketDetail;D=PHMSA-2012-0301>, (accessed February 2013).

and hospitalization questions. Note: expressed concerns that collecting hospitalization could violate the Health Insurance Portability and Accountability Act of 1996 (HIPAA; Pub.L. No. 104-191. 110 Stat. 1936, August 21, 1996)

### **Association of American Railroads**

- Suggests information on shell and head thickness is of little use if the package was not compromised
- Notes that the online tool does not accept multiple HM commodities/packages
- Highlights limitations of online tool for accepting EPA manifest numbers – field needs to accept alpha-numeric data – currently can only accept numeric submissions
- Suggests exploring increasing exceptions for vapor releases when no injury or evacuations occur; expand exceptions beyond PGIII
- Recommends extending the 30-day reporting requirement

### **The Council of Safe Transportation of Hazardous Articles**

- Notes inconsistencies in who's required to report (instructions, HMR, and interpretations) and confusion in the reporting requirements, specifically when a shipper or consignee is required to report; recommends using 49 CFR § 171.1(c) to define when a report is required
- Suggests methods to simply and streamline submissions – to include simplify package failure description and reduce confusing failure; creating modal specific forms; add battery information collection; mandate certain fields (noting use of “drop down” screens)
- Indicates that PHMSA's follow-up requests for data need to be timely
- Highlights that the online search engine needs improvement – multiple packages appear as multiple incidents which causes difficulties for industry when developing incident rate statistics
- Advocates establishing indices that include percentage rates of incidents

### **Dangerous Goods Advisory Council**

- Notes inconsistencies in who's required to report (instructions, HMR, and interpretations) and identified situations when shippers or consignees should be required to report
- Recommends that PHMSA should strive to obtain “denominator” data

### **FedEx Ground**

- Emphasizes that 50% of incidents they report are triggered by a “de minimis” release causing a disproportionately high number of reports – questions the benefit of collecting, analyzing, maintaining these low-risk incidents
- Suggests that these inflate and skew incident reported rates that could adversely affect the ability to obtain and renew special permits and causes increased scrutiny
- Proposes changes to the exceptions to include certain quantities of PGI and PGII materials

### **Institute of Makers of Explosives**

- Highlights and complements PHMSA for its recent accomplishments – focus on serious incidents, collecting undeclared data, expanding reporting requirements beyond carriers, online search tool, and helpful staff
- Suggests areas for improvement to include providing information and definitions to assist in searches; updating for to use current terminology (e.g., SPs); clarification on RAM shipments that are highway route controlled quantities; improving methods to better depict one incidents/many packages; improving the ability to compare data when agency indicators change (i.e., serious incident definition changes)
- Recommends obtaining “denominator” data – recommends updating 1998 report on “Hazardous Materials Shipments” and update it every three years
- Suggests that PHMSA should consider collecting loss and theft to help measure effectiveness of security requirements (without duplicating other agency data collection such as ATF)

### **National Propane Gas Association**

- Notes that person completing the form selects subjective failure codes – should be determined by someone with proper training
- Suggests that failure codes are too generic and can lead to incorrect conclusions

### **Reusable Industrial Packaging Association**

- Recommends that incident data should drive packaging enforcement
- Suggests adding collection of packaging thickness data (refers to fork lift punctures)
- Recommends simplifying and clarifying failure codes
- Requests change to form for package description (DOT F 5800.1 question 26(b))

### **Union Pacific Railroad**

- Highlights the need to accept revisions and updates online – provided an example of the rail industry’s online reporting system
- Suggests that the incident report form is not adequate to provide information for releases discovered after a derailment, but that were not caused by the derailment
- Recommends capturing intermodal container information, not just the packagings that failed inside the container

### **Veolia ES Technical Solutions, LLC**

- Questions why hazardous wastes are not included in the exception
- Recommends requiring the person who performed the activity that caused the release to submit the report

# Appendix C: Hazardous Materials Incident Report Forms DOT F 5800.1

Initial Report Form (1971 through 1989)<sup>72</sup>

DEPARTMENT OF TRANSPORTATION		Form Approved OMB No. 04-5613
<b>HAZARDOUS MATERIALS INCIDENT REPORT</b>		
<p><b>INSTRUCTIONS:</b> Submit this report in duplicate to the Secretary, Hazardous Materials Regulations Board, Department of Transportation, Washington, D.C. 20590, (ATTN: Opr. Div.). If space provided for any item is inadequate, complete that item under Section H, "Remarks", keying to the entry number being completed. Copies of this form, in limited quantities, may be obtained from the Secretary, Hazardous Materials Regulations Board. Additional copies in this prescribed format may be reproduced and used, if on the same size and kind of paper.</p>		
<b>A INCIDENT</b>		
1. TYPE OF OPERATION 1 <input type="checkbox"/> AIR 2 <input type="checkbox"/> HIGHWAY 3 <input type="checkbox"/> RAIL 4 <input type="checkbox"/> WATER 5 <input type="checkbox"/> FREIGHT FORWARDER 6 <input type="checkbox"/> OTHER (Identify) _____		
2. DATE AND TIME OF INCIDENT (Month - Day - Year) _____ a.m. _____ p.m.		3. LOCATION OF INCIDENT
<b>B REPORTING CARRIER, COMPANY OR INDIVIDUAL</b>		
4. FULL NAME		5. ADDRESS (Number, Street, City, State and Zip Code)
6. TYPE OF VEHICLE OR FACILITY		
<b>C SHIPMENT INFORMATION</b>		
7. NAME AND ADDRESS OF SHIPPER (Origin address)		8. NAME AND ADDRESS OF CONSIGNEE (Destination address)
9. SHIPPING PAPER IDENTIFICATION NO.		10. SHIPPING PAPERS ISSUED BY <input type="checkbox"/> CARRIER <input type="checkbox"/> SHIPPER <input type="checkbox"/> OTHER (Identify) _____
<b>D DEATHS, INJURIES, LOSS AND DAMAGE</b>		
DUE TO HAZARDOUS MATERIALS INVOLVED		13. ESTIMATED AMOUNT OF LOSS AND/OR PROPERTY DAMAGE INCLUDING COST OF DECONTAMINATION (Round off in dollars)  \$
11. NUMBER PERSONS INJURED	12. NUMBER PERSONS KILLED	
14. ESTIMATED TOTAL QUANTITY OF HAZARDOUS MATERIALS RELEASED		
<b>E HAZARDOUS MATERIALS INVOLVED</b>		
15. CLASSIFICATION (Sec. 172.4)	16. SHIPPING NAME (Sec. 172.5)	17. TRADE NAME
<b>F NATURE OF PACKAGING FAILURE</b>		
18. (Check all applicable boxes)		
(1) DROPPED IN HANDLING	(2) EXTERNAL PUNCTURE	(3) DAMAGE BY OTHER FREIGHT
(4) WATER DAMAGE	(5) DAMAGE FROM OTHER LIQUID	(6) FREEZING
(7) EXTERNAL HEAT	(8) INTERNAL PRESSURE	(9) CORROSION OR RUST
(10) DEFECTIVE FITTINGS, VALVES, OR CLOSURES	(11) LOOSE FITTINGS, VALVES OR CLOSURES	(12) FAILURE OF INNER RECEPTACLES
(13) BOTTOM FAILURE	(14) BODY*OR SIDE FAILURE	(15) WELD FAILURE
(16) CHIME FAILURE	(17) OTHER CONDITIONS (Identify)	19. SPACE FOR DOT USE ONLY

Form DOT F 5800.1 (10-70)

<sup>72</sup> Federal Register 35 (31 Oct. 1970): p. 16836.

G PACKAGING INFORMATION - <i>If more than one size or type packaging is involved in loss of material show packaging information separately for each. If more space is needed, use Section H "Remarks" below keying to the item number.</i>				
ITEM		#1	#2	#3
20	TYPE OF PACKAGING INCLUDING INNER RECEPTACLES ( <i>Steel drums, wooden box, cylinder, etc.</i> )			
21	CAPACITY OR WEIGHT PER UNIT ( <i>55 gallons, 65 lbs., etc.</i> )			
22	NUMBER OF PACKAGES FROM WHICH MATERIAL ESCAPED			
23	NUMBER OF PACKAGES OF SAME TYPE IN SHIPMENT			
24	DOT SPECIFICATION NUMBER(S) ON PACKAGES ( <i>21P, 17E, 3AA, etc., or none</i> )			
25	SHOW ALL OTHER DOT PACKAGING MARKINGS ( <i>Part 178</i> )			
26	NAME, SYMBOL, OR REGISTRATION NUMBER OF PACKAGING MANUFACTURER			
27	SHOW SERIAL NUMBER OF CYLINDERS, CARGO TANKS, TANK CARS, PORTABLE TANKS			
28	TYPE DOT LABEL(S) APPLIED			
29	IF RECONDITIONED OR REQUALIFIED, SHOW	A	REGISTRATION NO. OR SYMBOL	
		B	DATE OF LAST TEST OF INSPECTION	
30	IF SHIPMENT IS UNDER DOT OR USCG SPECIAL PERMIT, ENTER PERMIT NO.			
H REMARKS - Describe essential facts of incident including but not limited to defects, damage, probable cause, stowage, action taken at the time discovered, and action taken to prevent future incidents. Include any recommendations to improve packaging, handling, or transportation of hazardous materials. Photographs and diagrams should be submitted when necessary for clarification.				
31. NAME OF PERSON PREPARING REPORT ( <i>Type or print</i> )			32. SIGNATURE	
33. TELEPHONE NO. ( <i>Include Area Code</i> )			34. DATE REPORT PREPARED	

*First Revision to the Incident Report Form - 1990 through 2004<sup>73</sup>*

DEPARTMENT OF TRANSPORTATION HAZARDOUS MATERIALS INCIDENT REPORT				Form Approved OMB No 2137-0039
<p><b>INSTRUCTIONS:</b> Submit this report in duplicate to the Information Systems Manager, Office of Hazardous Materials Transportation, DHM-63, Research and Special Programs Administration, U.S. Department of Transportation, Washington, D.C. 20590. If space provided for any item is inadequate, complete that item under Section IX, keying to the entry number being completed. Copies of this form, in limited quantities, may be obtained from the Information Systems Manager, Office of Hazardous Materials Transportation. Additional copies in this prescribed format may be reproduced and used, if on the same size and kind of paper.</p>				
<b>I. MODE, DATE, AND LOCATION OF INCIDENT</b>				
1. MODE OF TRANSPORTATION <input type="checkbox"/> AIR <input type="checkbox"/> HIGHWAY <input type="checkbox"/> RAIL <input type="checkbox"/> WATER <input type="checkbox"/> OTHER				
2. DATE AND TIME OF INCIDENT <small>(Use Military Time e.g. 8:30am = 0830,  noon = 1200, 5pm = 1800, midnight = 2400)</small>				
3. LOCATION OF INCIDENT (Include airport name in ROUTE-STREET if incident occurs at an airport)				
CITY		STATE		
COUNTY		ROUTE-STREET		
<b>II. DESCRIPTION OF CARRIER, COMPANY, OR INDIVIDUAL REPORTING</b>				
4. FULL NAME		5. ADDRESS (Principal place of business)		
6. LIST YOUR OMC MOTOR CARRIER CENSUS NUMBER, REPORTING RAILROAD ALPHABETIC CODE, MERCHANT VESSEL NAME AND ID NUMBER OR OTHER REPORTING CODE OR NUMBER				
<b>III. SHIPMENT INFORMATION (From Shipping Paper or Packaging)</b>				
7. SHIPPER NAME AND ADDRESS (Principal place of business)		8. CONSIGNEE NAME AND ADDRESS (Principal place of business)		
9. ORIGIN ADDRESS (if different from Shipper address)		10. DESTINATION ADDRESS (if different from Consignee address)		
11. SHIPPING PAPER/WAYBILL IDENTIFICATION NO.				
<b>IV. HAZARDOUS MATERIAL(S) SPILLED (NOTE: REFERENCE 49 CFR SECTION 172.101.)</b>				
12. PROPER SHIPPING NAME		13. CHEMICAL/TRADE NAME	14. HAZARD CLASS	15. IDENTIFICATION NUMBER (e.g. UM 2754, NA 2620)
16. IS MATERIAL A HAZARDOUS SUBSTANCE? <input type="checkbox"/> YES <input type="checkbox"/> NO		17. WAS THE RD MET? <input type="checkbox"/> YES <input type="checkbox"/> NO		
<b>V. CONSEQUENCES OF INCIDENT, DUE TO THE HAZARDOUS MATERIAL.</b>				
18. ESTIMATED QUANTITY HAZARDOUS MATERIAL RELEASED (include units of measurement)		19. FATALITIES	20. HOSPITALIZED INJURIES	21. NON HOSPITALIZED INJURIES
22. NUMBER OF PEOPLE EVACUATED				
23. ESTIMATED DOLLAR AMOUNT OF LOSS AND/OR PROPERTY DAMAGE, INCLUDING COST OF DECONTAMINATION OR CLEANUP (Round off <sup>1</sup> in dollars)				
A. PRODUCT LOSS	B. CARRIER DAMAGE	C. PUBLIC/PRIVATE PROPERTY DAMAGE	D. DECONTAMINATION/ CLEANUP	E. OTHER
24. CONSEQUENCES ASSOCIATED WITH THE INCIDENT <input type="checkbox"/> VAPOR (GAS) DISPERSION <input type="checkbox"/> MATERIAL ENTERED WATERWAY/SEWER				
<input type="checkbox"/> SPILLAGE	<input type="checkbox"/> FIRE	<input type="checkbox"/> EXPLOSION	<input type="checkbox"/> ENVIRONMENTAL DAMAGE	<input type="checkbox"/> NONE <input type="checkbox"/> OTHER
<b>VI. TRANSPORT ENVIRONMENT</b>				
25. INDICATE TYPE(S) OF VEHICLE(S) INVOLVED <input type="checkbox"/> CARGO TANK <input type="checkbox"/> VAN TRUCK/TRAILER <input type="checkbox"/> FLAT BED TRUCK/TRAILER				
<input type="checkbox"/> TANK CAR	<input type="checkbox"/> RAIL CAR	<input type="checkbox"/> TOPC/OFC	<input type="checkbox"/> AIRCRAFT	<input type="checkbox"/> BARGE <input type="checkbox"/> SHIP <input type="checkbox"/> OTHER
26. TRANSPORTATION PHASE DURING WHICH INCIDENT OCCURRED OR WAS DISCOVERED				
<input type="checkbox"/> EN ROUTE BETWEEN ORIGIN/DESTINATION	<input type="checkbox"/> LOADING	<input type="checkbox"/> UNLOADING	<input type="checkbox"/> TEMPORARY STORAGE TERMINAL	
27. LAND USE AT INCIDENT SITE <input type="checkbox"/> INDUSTRIAL <input type="checkbox"/> COMMERCIAL <input type="checkbox"/> RESIDENTIAL <input type="checkbox"/> AGRICULTURAL <input type="checkbox"/> UNDEVELOPED				
28. COMMUNITY TYPE AT SITE <input type="checkbox"/> URBAN <input type="checkbox"/> SUBURBAN <input type="checkbox"/> RURAL				
29. WAS THE SPILL THE RESULT OF A VEHICLE ACCIDENT/DERAILMENT? <input type="checkbox"/> YES <input type="checkbox"/> NO				
IF YES AND APPLICABLE, ANSWER PARTS A THRU C				
A. ESTIMATED SPEED	B. HIGHWAY TYPE <input type="checkbox"/> DIVIDED/LIMITED ACCESS <input type="checkbox"/> UNDIVIDED	C. TOTAL NUMBER OF LANES <input type="checkbox"/> ONE <input type="checkbox"/> THREE <input type="checkbox"/> TWO <input type="checkbox"/> FOUR OR MORE		SPACE FOR DOT USE ONLY

FORM DOT F 5005-1 (Rev. 8/89) Supersedes DOT F 5005-1 (10/72) (5-1176)

THIS FORM MAY BE REPRODUCED

<sup>73</sup> Federal Register 54 (19 June 1989): pp. 25814-25815.

VII. PACKAGING INFORMATION: If the package is overpacked (consists of several packages, e.g. glass jars within a fiberboard box), begin with Column A for information on the innermost package.																																																																																																																										
ITEM	A	B	C																																																																																																																							
30. TYPE OF PACKAGING INCLUDING INNER RECEPTACLES (e.g. Steel drum, tank car)																																																																																																																										
31. CAPACITY OR WEIGHT PER UNIT PACKAGE (e.g. 55 gallons, 65 lbs.)																																																																																																																										
32. NUMBER OF PACKAGES OF SAME TYPE WHICH FAILED IN IDENTICAL MANNER																																																																																																																										
33. NUMBER OF PACKAGES OF SAME TYPE IN SHIPMENT																																																																																																																										
34. PACKAGE SPECIFICATION IDENTIFICATION (e.g. DOT 17E, DOT 105A100, UN 1A1 or none)																																																																																																																										
35. ANY OTHER PACKAGING MARKINGS (e.g. STC, 1B169528, Y1 473097)																																																																																																																										
36. NAME AND ADDRESS, SYMBOL OR REGISTRATION NUMBER OF PACKAGING MANUFACTURER																																																																																																																										
37. SERIAL NUMBER OF CYLINDERS, PORTABLE TANKS, CARGO TANKS, TANK CARS																																																																																																																										
38. TYPE OF LABELING OR PLACARDING APPLIED																																																																																																																										
39. IF RECONDITIONED OR REQUALIFIED	A REGISTRATION NUMBER OR SYMBOL																																																																																																																									
	B DATE OF LAST TEST OR INSPECTION																																																																																																																									
40. EXEMPTION/APPROVAL/COMPETENT AUTHORITY NUMBER IF APPLICABLE (e.g. DOT E1012)																																																																																																																										
VIII. DESCRIPTION OF PACKAGING FAILURE: Check all applicable boxes for the package(s) identified above.																																																																																																																										
41. ACTION CONTRIBUTING TO PACKAGING FAILURE		42. OBJECT CAUSING FAILURE																																																																																																																								
<table border="0"> <tr><td>A</td><td>B</td><td>C</td><td></td></tr> <tr><td>a</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>TRANSPORT VEHICLE COLLISION</td></tr> <tr><td>b</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>TRANSPORT VEHICLE OVERTURN</td></tr> <tr><td>c</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>OVERLOADING/OVERFILLING</td></tr> <tr><td>d</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>LOOSE FITTINGS, VALVES</td></tr> <tr><td>e</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>DEFECTIVE FITTINGS, VALVES</td></tr> <tr><td>f</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>DROPPED</td></tr> <tr><td>g</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>STRUCK/RAMMED</td></tr> <tr><td>h</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>IMPROPER LOADING</td></tr> <tr><td>i</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>IMPROPER BLOCKING</td></tr> </table>	A	B	C		a	<input type="checkbox"/>	<input type="checkbox"/>	TRANSPORT VEHICLE COLLISION	b	<input type="checkbox"/>	<input type="checkbox"/>	TRANSPORT VEHICLE OVERTURN	c	<input type="checkbox"/>	<input type="checkbox"/>	OVERLOADING/OVERFILLING	d	<input type="checkbox"/>	<input type="checkbox"/>	LOOSE FITTINGS, VALVES	e	<input type="checkbox"/>	<input type="checkbox"/>	DEFECTIVE FITTINGS, VALVES	f	<input type="checkbox"/>	<input type="checkbox"/>	DROPPED	g	<input type="checkbox"/>	<input type="checkbox"/>	STRUCK/RAMMED	h	<input type="checkbox"/>	<input type="checkbox"/>	IMPROPER LOADING	i	<input type="checkbox"/>	<input type="checkbox"/>	IMPROPER BLOCKING	<table border="0"> <tr><td>A</td><td>B</td><td>C</td><td></td></tr> <tr><td>j</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>CORROSION</td></tr> <tr><td>k</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>METAL FATIGUE</td></tr> <tr><td>l</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>FRICTION/RUBBING</td></tr> <tr><td>m</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>FIRE/HEAT</td></tr> <tr><td>n</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>FREEZING</td></tr> <tr><td>o</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>VENTING</td></tr> <tr><td>p</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>VANDALISM</td></tr> <tr><td>q</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>INCOMPATIBLE MATERIALS</td></tr> <tr><td>r</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>OTHER _____</td></tr> </table>	A	B	C		j	<input type="checkbox"/>	<input type="checkbox"/>	CORROSION	k	<input type="checkbox"/>	<input type="checkbox"/>	METAL FATIGUE	l	<input type="checkbox"/>	<input type="checkbox"/>	FRICTION/RUBBING	m	<input type="checkbox"/>	<input type="checkbox"/>	FIRE/HEAT	n	<input type="checkbox"/>	<input type="checkbox"/>	FREEZING	o	<input type="checkbox"/>	<input type="checkbox"/>	VENTING	p	<input type="checkbox"/>	<input type="checkbox"/>	VANDALISM	q	<input type="checkbox"/>	<input type="checkbox"/>	INCOMPATIBLE MATERIALS	r	<input type="checkbox"/>	<input type="checkbox"/>	OTHER _____	<table border="0"> <tr><td>A</td><td>B</td><td>C</td><td></td></tr> <tr><td>s</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>OTHER FREIGHT</td></tr> <tr><td>t</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>FORKLIFT</td></tr> <tr><td>u</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>NAIL/PROTRUSION</td></tr> <tr><td>v</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>OTHER TRANSPORT VEHICLE</td></tr> <tr><td>w</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>WATER/OTHER LIQUID</td></tr> <tr><td>x</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>GROUND/FLOOR/ROADWAY</td></tr> <tr><td>y</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>ROADSIDE OBSTACLE</td></tr> <tr><td>z</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>NONE</td></tr> <tr><td>aa</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>OTHER</td></tr> </table>	A	B	C		s	<input type="checkbox"/>	<input type="checkbox"/>	OTHER FREIGHT	t	<input type="checkbox"/>	<input type="checkbox"/>	FORKLIFT	u	<input type="checkbox"/>	<input type="checkbox"/>	NAIL/PROTRUSION	v	<input type="checkbox"/>	<input type="checkbox"/>	OTHER TRANSPORT VEHICLE	w	<input type="checkbox"/>	<input type="checkbox"/>	WATER/OTHER LIQUID	x	<input type="checkbox"/>	<input type="checkbox"/>	GROUND/FLOOR/ROADWAY	y	<input type="checkbox"/>	<input type="checkbox"/>	ROADSIDE OBSTACLE	z	<input type="checkbox"/>	<input type="checkbox"/>	NONE	aa	<input type="checkbox"/>	<input type="checkbox"/>	OTHER
A	B	C																																																																																																																								
a	<input type="checkbox"/>	<input type="checkbox"/>	TRANSPORT VEHICLE COLLISION																																																																																																																							
b	<input type="checkbox"/>	<input type="checkbox"/>	TRANSPORT VEHICLE OVERTURN																																																																																																																							
c	<input type="checkbox"/>	<input type="checkbox"/>	OVERLOADING/OVERFILLING																																																																																																																							
d	<input type="checkbox"/>	<input type="checkbox"/>	LOOSE FITTINGS, VALVES																																																																																																																							
e	<input type="checkbox"/>	<input type="checkbox"/>	DEFECTIVE FITTINGS, VALVES																																																																																																																							
f	<input type="checkbox"/>	<input type="checkbox"/>	DROPPED																																																																																																																							
g	<input type="checkbox"/>	<input type="checkbox"/>	STRUCK/RAMMED																																																																																																																							
h	<input type="checkbox"/>	<input type="checkbox"/>	IMPROPER LOADING																																																																																																																							
i	<input type="checkbox"/>	<input type="checkbox"/>	IMPROPER BLOCKING																																																																																																																							
A	B	C																																																																																																																								
j	<input type="checkbox"/>	<input type="checkbox"/>	CORROSION																																																																																																																							
k	<input type="checkbox"/>	<input type="checkbox"/>	METAL FATIGUE																																																																																																																							
l	<input type="checkbox"/>	<input type="checkbox"/>	FRICTION/RUBBING																																																																																																																							
m	<input type="checkbox"/>	<input type="checkbox"/>	FIRE/HEAT																																																																																																																							
n	<input type="checkbox"/>	<input type="checkbox"/>	FREEZING																																																																																																																							
o	<input type="checkbox"/>	<input type="checkbox"/>	VENTING																																																																																																																							
p	<input type="checkbox"/>	<input type="checkbox"/>	VANDALISM																																																																																																																							
q	<input type="checkbox"/>	<input type="checkbox"/>	INCOMPATIBLE MATERIALS																																																																																																																							
r	<input type="checkbox"/>	<input type="checkbox"/>	OTHER _____																																																																																																																							
A	B	C																																																																																																																								
s	<input type="checkbox"/>	<input type="checkbox"/>	OTHER FREIGHT																																																																																																																							
t	<input type="checkbox"/>	<input type="checkbox"/>	FORKLIFT																																																																																																																							
u	<input type="checkbox"/>	<input type="checkbox"/>	NAIL/PROTRUSION																																																																																																																							
v	<input type="checkbox"/>	<input type="checkbox"/>	OTHER TRANSPORT VEHICLE																																																																																																																							
w	<input type="checkbox"/>	<input type="checkbox"/>	WATER/OTHER LIQUID																																																																																																																							
x	<input type="checkbox"/>	<input type="checkbox"/>	GROUND/FLOOR/ROADWAY																																																																																																																							
y	<input type="checkbox"/>	<input type="checkbox"/>	ROADSIDE OBSTACLE																																																																																																																							
z	<input type="checkbox"/>	<input type="checkbox"/>	NONE																																																																																																																							
aa	<input type="checkbox"/>	<input type="checkbox"/>	OTHER																																																																																																																							
43. HOW PACKAGE(S) FAILED	44. PACKAGE AREA THAT FAILED		45. WHAT FAILED ON PACKAGE(S)																																																																																																																							
<table border="0"> <tr><td>A</td><td>B</td><td>C</td><td></td></tr> <tr><td>a</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>PUNCTURED</td></tr> <tr><td>b</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>CRACKED</td></tr> <tr><td>c</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>BURST/INTERNAL PRESSURE</td></tr> <tr><td>d</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>RIPPED</td></tr> <tr><td>e</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>CRUSHED</td></tr> <tr><td>f</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>RUBBED/ABRADED</td></tr> <tr><td>g</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>RUPTURED</td></tr> <tr><td>h</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>OTHER _____</td></tr> </table>	A	B	C		a	<input type="checkbox"/>	<input type="checkbox"/>	PUNCTURED	b	<input type="checkbox"/>	<input type="checkbox"/>	CRACKED	c	<input type="checkbox"/>	<input type="checkbox"/>	BURST/INTERNAL PRESSURE	d	<input type="checkbox"/>	<input type="checkbox"/>	RIPPED	e	<input type="checkbox"/>	<input type="checkbox"/>	CRUSHED	f	<input type="checkbox"/>	<input type="checkbox"/>	RUBBED/ABRADED	g	<input type="checkbox"/>	<input type="checkbox"/>	RUPTURED	h	<input type="checkbox"/>	<input type="checkbox"/>	OTHER _____	<table border="0"> <tr><td>A</td><td>B</td><td>C</td><td></td></tr> <tr><td>a</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>END, FORWARD</td></tr> <tr><td>b</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>END, REAR</td></tr> <tr><td>c</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>SIDE, RIGHT</td></tr> <tr><td>d</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>SIDE, LEFT</td></tr> <tr><td>e</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>TOP</td></tr> <tr><td>f</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>BOTTOM</td></tr> <tr><td>g</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>CENTER</td></tr> <tr><td>h</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>OTHER _____</td></tr> </table>		A	B	C		a	<input type="checkbox"/>	<input type="checkbox"/>	END, FORWARD	b	<input type="checkbox"/>	<input type="checkbox"/>	END, REAR	c	<input type="checkbox"/>	<input type="checkbox"/>	SIDE, RIGHT	d	<input type="checkbox"/>	<input type="checkbox"/>	SIDE, LEFT	e	<input type="checkbox"/>	<input type="checkbox"/>	TOP	f	<input type="checkbox"/>	<input type="checkbox"/>	BOTTOM	g	<input type="checkbox"/>	<input type="checkbox"/>	CENTER	h	<input type="checkbox"/>	<input type="checkbox"/>	OTHER _____	<table border="0"> <tr><td>A</td><td>B</td><td>C</td><td></td></tr> <tr><td>a</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>BASIC PACKAGE MATERIAL</td></tr> <tr><td>b</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>FITTING/VALVE</td></tr> <tr><td>c</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>CLOSURE</td></tr> <tr><td>d</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>CHIME</td></tr> <tr><td>e</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>WELD/SEAM</td></tr> <tr><td>f</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>HOSE/PIPING</td></tr> <tr><td>g</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>INNER LINER</td></tr> <tr><td>h</td><td><input type="checkbox"/></td><td><input type="checkbox"/></td><td>OTHER</td></tr> </table>	A	B	C		a	<input type="checkbox"/>	<input type="checkbox"/>	BASIC PACKAGE MATERIAL	b	<input type="checkbox"/>	<input type="checkbox"/>	FITTING/VALVE	c	<input type="checkbox"/>	<input type="checkbox"/>	CLOSURE	d	<input type="checkbox"/>	<input type="checkbox"/>	CHIME	e	<input type="checkbox"/>	<input type="checkbox"/>	WELD/SEAM	f	<input type="checkbox"/>	<input type="checkbox"/>	HOSE/PIPING	g	<input type="checkbox"/>	<input type="checkbox"/>	INNER LINER	h	<input type="checkbox"/>	<input type="checkbox"/>	OTHER											
A	B	C																																																																																																																								
a	<input type="checkbox"/>	<input type="checkbox"/>	PUNCTURED																																																																																																																							
b	<input type="checkbox"/>	<input type="checkbox"/>	CRACKED																																																																																																																							
c	<input type="checkbox"/>	<input type="checkbox"/>	BURST/INTERNAL PRESSURE																																																																																																																							
d	<input type="checkbox"/>	<input type="checkbox"/>	RIPPED																																																																																																																							
e	<input type="checkbox"/>	<input type="checkbox"/>	CRUSHED																																																																																																																							
f	<input type="checkbox"/>	<input type="checkbox"/>	RUBBED/ABRADED																																																																																																																							
g	<input type="checkbox"/>	<input type="checkbox"/>	RUPTURED																																																																																																																							
h	<input type="checkbox"/>	<input type="checkbox"/>	OTHER _____																																																																																																																							
A	B	C																																																																																																																								
a	<input type="checkbox"/>	<input type="checkbox"/>	END, FORWARD																																																																																																																							
b	<input type="checkbox"/>	<input type="checkbox"/>	END, REAR																																																																																																																							
c	<input type="checkbox"/>	<input type="checkbox"/>	SIDE, RIGHT																																																																																																																							
d	<input type="checkbox"/>	<input type="checkbox"/>	SIDE, LEFT																																																																																																																							
e	<input type="checkbox"/>	<input type="checkbox"/>	TOP																																																																																																																							
f	<input type="checkbox"/>	<input type="checkbox"/>	BOTTOM																																																																																																																							
g	<input type="checkbox"/>	<input type="checkbox"/>	CENTER																																																																																																																							
h	<input type="checkbox"/>	<input type="checkbox"/>	OTHER _____																																																																																																																							
A	B	C																																																																																																																								
a	<input type="checkbox"/>	<input type="checkbox"/>	BASIC PACKAGE MATERIAL																																																																																																																							
b	<input type="checkbox"/>	<input type="checkbox"/>	FITTING/VALVE																																																																																																																							
c	<input type="checkbox"/>	<input type="checkbox"/>	CLOSURE																																																																																																																							
d	<input type="checkbox"/>	<input type="checkbox"/>	CHIME																																																																																																																							
e	<input type="checkbox"/>	<input type="checkbox"/>	WELD/SEAM																																																																																																																							
f	<input type="checkbox"/>	<input type="checkbox"/>	HOSE/PIPING																																																																																																																							
g	<input type="checkbox"/>	<input type="checkbox"/>	INNER LINER																																																																																																																							
h	<input type="checkbox"/>	<input type="checkbox"/>	OTHER																																																																																																																							
IX. DESCRIPTION OF EVENTS: Describe the sequence of events that led to incident, action taken at time discovered, and action taken to prevent future incidents. Include any recommendations to improve packaging, handling, or transportation of hazardous materials. Photographs and diagrams should be submitted when necessary for clarification. ATTACH A COPY OF THE HAZARDOUS WASTE MANIFEST FOR INCIDENTS INVOLVING HAZARDOUS WASTE. Continue on additional sheets if necessary.																																																																																																																										
46. NAME OF PERSON RESPONSIBLE FOR PREPARING REPORT		47. SIGNATURE																																																																																																																								
48. TITLE OF PERSON RESPONSIBLE FOR PREPARING REPORT		49. TELEPHONE NUMBER (Area Code)	50. DATE REPORT SIGNED																																																																																																																							



**PART III - PACKAGING INFORMATION**

24. Check Packaging Type (check only one - if more than one, list type of packaging, copy Part III, and complete for each type:

- Non-bulk
- IBC
- Cargo tank Motor Vehicle (CTMV)
- Tank Car
- Cylinder
- RAM
- Portable Tank
- Other \_\_\_\_\_

25. See instructions and enter the appropriate failure codes found at the end of the instructions. Be sure to enter the codes from the list that corresponds to the particular packaging type checked above. Enter the number of codes as appropriate to describe the incident. Enter the most important failure point in line 1. If there are more than two failure points, provide in this format in part VI.

- 1. What Failed: \_\_\_\_\_ How Failed: \_\_\_\_\_ Causes of Failure: \_\_\_\_\_
- 2. What Failed: \_\_\_\_\_ How Failed: \_\_\_\_\_ Causes of Failure: \_\_\_\_\_

26a. Provide the packaging identification markings, if available.

Identification Markings: \_\_\_\_\_  
(Examples: 1A1/Y1.4/150/92/USA/RB/93/RL, UN31H1/Y0493/USA/M9339/10800/1200, DOT - 105A - 100W (RAIL), DOT 406 (HIGHWAY), DOT 51, DOT 3-A)

26b. For Non-bulk, IBC, or non-specification packaging, if identification markings are incomplete or unavailable, see instructions and complete the following:

<b>Single Package or Outer Packaging:</b>	<b>Single Package or Inner Packaging (if any):</b>
Packaging Type: _____	Packaging Type: _____
Material of Construction: _____	Material of Construction: _____
Head Type (Drums only): <input type="checkbox"/> Removable <input type="checkbox"/> Non - Removable	

27. Describe the package capacity and the quantity:

<b>Single Package or Outer Packaging:</b>	<b>Single Package or Inner Packaging (if any):</b>
Package Capacity: _____	Package Capacity: _____
Amount in Package: _____	Amount in Package: _____
Number in Shipment: _____	Number in Shipment: _____
Number Failed: _____	Number Failed: _____

28. Provide packaging construction and test information, as appropriate:

Manufacturer: \_\_\_\_\_ Manufacture Date: \_\_\_\_\_  
Serial Number: \_\_\_\_\_ Last Test Date: \_\_\_\_\_  
Material of Construction: \_\_\_\_\_ (if Tank Car, CTMV, Portable Tank, or Cylinder)  
Design Pressure: \_\_\_\_\_ (if Tank Car, CTMV, Portable Tank)  
Shell Thickness: \_\_\_\_\_ (if Tank Car, CTMV, Portable Tank)  
Head Thickness: \_\_\_\_\_ (if Tank Car, CTMV)  
Service Pressure: \_\_\_\_\_ (if Cylinder)  
If valve or device failed:  
Type: \_\_\_\_\_ Manufacturer: \_\_\_\_\_ Model: \_\_\_\_\_  
(if present and legible) (if present and legible)

29. If the packaging is for Radioactive Materials, complete the following:

Packaging Category:  Type A  Type B  Type C  Excepted  Industrial  
Packaging Certification:  Self Certified  U.S. Certification Certification Number \_\_\_\_\_  
Nuclide(s) Present: \_\_\_\_\_ Transport Index: \_\_\_\_\_  
Activity: \_\_\_\_\_ Critical Safety Index: \_\_\_\_\_

**PART IV - CONSEQUENCES**

30. Result of Incident (check all that apply):  Spillage  Fire  Explosion  Material Entered Waterway/Storm Sewer  
 Vapor (Gas) Dispersion  Environmental Damage  No Release

31. Emergency Response : The following entities responded to the incident: (Check all that apply)  
 Fire/EMS Report # \_\_\_\_\_  Police Report # \_\_\_\_\_  In-house cleanup  Other Cleanup

32. Damages: Was the total damage cost more than \$500?  Yes  No  
If yes, enter the following information: If no, go to question 33.  
Material Loss: \$ \_\_\_\_\_ Carrier Damage: \$ \_\_\_\_\_ Property Damage: \$ \_\_\_\_\_ Response Cost: \$ \_\_\_\_\_ Remediation/Cleanup Cost: \$ \_\_\_\_\_  
(See damage definitions in the instructions)

33a. Did the hazardous material cause or contribute to a human fatality?  Yes  No  
If yes, enter the number of fatalities resulting from the hazardous material:  
Fatalities: Employees \_\_\_\_\_ Responders \_\_\_\_\_ General Public \_\_\_\_\_

33b. Were there human fatalities that did not result from the hazardous material?  Yes  No If yes, how many? \_\_\_\_\_

34. Did the hazardous material cause or contribute to personal injury?  Yes  No  
If yes, enter the number of injuries resulting from the hazardous material:  
Hospitalized (Admitted Only): Employees \_\_\_\_\_ Responders \_\_\_\_\_ General Public \_\_\_\_\_  
Non-Hospitalized: Employees \_\_\_\_\_ Responders \_\_\_\_\_ General Public \_\_\_\_\_  
(e.g.: On site first aid or Emergency Room observation and release)

35. Did the hazardous material cause or contribute to an evacuation?  Yes  No  
If yes, provide the following information:  
Total number of general public evacuated \_\_\_\_\_ Total number of employees evacuated \_\_\_\_\_ Total Evacuated \_\_\_\_\_  
Duration of the evacuation \_\_\_\_\_ (hours)

36. Was a major transportation artery or facility closed?  Yes  No If yes, how many? \_\_\_\_\_ (hours)

37. Was the material involved in a crash or derailment?  Yes  No  
If yes, provide the following information: Estimated speed (mph): \_\_\_\_\_ Weather conditions: \_\_\_\_\_  
Vehicle overturn?  Yes  No  
Vehicle left roadway/track?  Yes  No

**PART V - AIR INCIDENT INFORMATION** (please refer to § 175.31 to report a discrepancy for air shipments)

38. Was the shipment on a passenger aircraft?  Yes  No  
If yes, was it tendered as cargo, or as passenger baggage?  
 Cargo  Passenger baggage

39. Where did the incident occur (if unknown, check the appropriate box for the location where the incident was discovered)?  
 Air carrier cargo facility  Sort center  Baggage area  
 By surface to/from airport  During flight  During loading/unloading of aircraft

40. What phase(s) had the shipment already undergone prior to the incident? (Check all that apply)  
 Shipment had not been transported  Transported by air (first flight)  Transport by air (subsequent flights)  
 Initial transport by highway to cargo facility  Transfer at sort center/cargo facility

**PART VI - DESCRIPTION OF EVENTS & PACKAGE FAILURE**

Describe the sequence of events that led to the incident and the actions taken at the time it was discovered. Describe the package failure, including the size and location of holes, cracks, etc. Photographs and diagrams should be submitted if needed for clarification. Estimate the duration of the release, if possible. Describe what was done to mitigate the effects of the release. Continue on additional sheets if necessary.

**PART VII - RECOMMENDATIONS/ACTIONS TAKEN TO PREVENT RECURRENCE**

Where you are able to do so, suggest or describe changes (such as additional training, use of better packaging, or improved operating procedures) to help prevent recurrence. Provide recommendations for improvement to hazardous materials transportation beyond the control of your individual company. Continue on additional sheets if necessary.

**PART VIII- CONTACT INFORMATION**

Contact's Name (Type or Print): _____	Telephone Number: (    ) _____
Contact's Title: _____	Fax Number: (    ) _____
Business Name and Address: _____	Hazmat Registration Number (if not already provided): _____
E-mail Address: _____	Date: _____
Preparer is: <input type="checkbox"/> Carrier <input type="checkbox"/> Shipper <input type="checkbox"/> Facility <input type="checkbox"/> Other _____	

# Appendix D: Summary of Petitions for Rulemaking

In July 2010, the American Coatings Association (ACA), a voluntary, nonprofit trade association of the paint and coating industry and its professionals, as well as the American Trucking Association (ATA), a national trade association representing the interests of the trucking industry, both independently submitted petitions for rulemaking to change the incident reporting requirements.

The ACA explains that prior to January 1, 2005, PHMSA, under § 171.16, did not require carriers to submit a DOT F 5800.1 for “incidents involving any paint or paint-related materials in packaging of five gallons or less, unless the materials was Packaging Group (PG) I material.”<sup>75</sup> In 2005, however, PHMSA changed this reporting requirement to report an incident not only when the material was a PGI material, but also a PGII material and there was an aggregate release of more than 20 liters (5.2 gallons) for liquids and 30 kg (66 pounds) for solids.<sup>76</sup>

The ACA argues that a release of five gallons or less of a PGII paint or paint-related materials does not pose an environmental, health, or security risk; ACA argues that the worse consequence of this type of spill is a “vigorous clean-up effort.” ACA identifies that from January 1, 2007 to December 31, 2009, over 10,000 DOT F 5800.1 were reported for PGII spills of less than 6 gallons, yet “none of these incidents were serious as defined by the HMR and there were no fatalities or injuries that required hospitalization in connection with these incidents.”<sup>77</sup> Furthermore, the information provided in these reports is incomplete and inaccurate, making the data “not reliable, consistent, useful or meaningful.” Since PHMSA has been collecting PGII, in packages of five gallons or less, it has not conducted any report or activity that has resulted in regulatory activity with this commodity.

The ATA has a similar proposal regarding Class 3 material in PGII containers with a capacity less than 5.2 gallons. However, ATA offers additional adjustments. ATA proposes that incident reporting requirements be adjusted to:

- Not require a report for Class 3 flammable materials in PGII when transported in packages with a capacity of less than 5.2 gallons (in § 171.16);
- Increase the aggregate spill threshold of Class 3 materials in PGII and PGIII to 30 gallons (in § 171.16);
- Not require a report for spills that occur on loading dock as a result of a condition not normally incident to transportation (e.g. piercing of a container by a forklift, nail, or dunnage) where such spill is not attributable to a packaging failure (in § 171.16);
- Revise reference to “breakage” in § 171.15 as this is a subjective term; and

---

<sup>75</sup> American Coatings Association, “Petition for Rulemaking; Proposed Amendment to the Requirement for Incident Reporting in Order to Collect Meaningful Incident Data,” (<http://www.regulations.gov/#!docketDetail;D=PHMSA-2010-0225>, 29 July, 2010), p. 2. February 2013.

<sup>76</sup> Ibid, p. 3.

<sup>77</sup> Ibid, p. 3.

- Preempt states from requiring separate immediate notice of hazardous materials incidents.<sup>78</sup>

ATA argues, as the ACA did, that Class 3 materials in PGII and PGIII when transported in packages with capacity of less than 5.2 gallons poses an “insignificant safety risk” and reporting these incidents, creates an unnecessary administrative burden on both PHMSA and the regulated industry. Furthermore, ATA similarly highlights the fact that PHMSA has not revised package standards of these materials with the information from the reports. ATA states, “as such, the burden associated with these reports far exceeds the regulatory benefit.”<sup>79</sup>

---

<sup>78</sup> American Trucking Association, “Petition for Rulemaking – Incident Reporting Requirements,” p. 2.

<sup>79</sup> Ibid, p. 4.