

# DOT PHMSA XML Submissions

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# Table of Contents

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
1.1	PURPOSE .....	1
1.2	BENEFITS .....	1
<b>2</b>	<b>PROCESS OVERVIEW .....</b>	<b>1</b>
<b>3</b>	<b>SUBMISSION AND RESPONSE DOCUMENTS.....</b>	<b>2</b>
3.1	CHARACTERISTICS AND SUBMISSIONS .....	2
3.2	CHARACTERISTICS OF THE RESPONSE .....	2
<b>4</b>	<b>SERVICE SETUP.....</b>	<b>4</b>
4.1	REGISTRATION WITH PHMSA .....	4
4.2	RESEARCH AND DEVELOPMENT .....	4
4.3	TEST .....	5
4.4	PRODUCTION .....	5
<b>5</b>	<b>CONTACT INFORMATION.....</b>	<b>6</b>
	Appendix A .....	7

# 1 Introduction

## 1.1 Purpose

An unintentional release of hazardous materials meeting the criteria set forth in Section 171.16, 49 Code of Federal Regulations must be reported to DOT on Form 5800.1. The Hazardous Materials Information System (HMIS) is used for entering and storing that information from the 5800.1 Forms that are submitted via US Mail, Web, or XML submissions.

This document contains the steps needed to enable carriers to electronically submit the DOT Form 5800.1 (Incident Reports) in XML format to the Pipeline and Hazardous Materials Safety Administration (PHMSA).

## 1.2 Benefits

Allowing electronic reporting when a hazardous spill occurs is part of PHMSA's strategy to address the President's e-government program. The initiative aims to do the following:

- Reduce the amount of data entered manually from paper submissions.
- Automate the submission and response processes.
- Improve data quality and accuracy.
- Alleviate the effort for carriers that must file a large volume of incidents per year.
- Speed the process for responding to public requests for information.

# 2 Process Overview

Organizations that want to use this service should contact PHMSA for registration. Once registered, customers will be provided with their own test account with a company-specific, password-protected folder on the PHMSA file server. They will then receive the applicable connection details.

PHMSA has created XML schemas for DOT Form 5800.1. Customers can download those schemas and customize their own systems to generate Incident Reports that conform to the XML schemas. Each organization can then run test file submissions until the submissions meet the criteria established by PHMSA for electronic submission. Once the submission criteria have been met, the organization can begin submitting data to the production environment.

All external XML file submissions of DOT Form 5800.1 must be transmitted using Secure File Transfer Protocol (sFTP) in the Test and Production environments. Files will then be directed to each customer's private folder where the Incident Reports XML Parser will pick them up for immediate processing, storing, and response.

XML submissions that do not conform to the mandatory field requirements within the schema will be rejected by the XML Parser. Reports that do not conform to the allowed value field requirements within the schema may or may not be rejected depending on the level of non-conformance with the schema.

For each XML file submitted, the filer will receive an e-mail acknowledgment containing information about the status of the submission, the client's and PHMSA's Incident Report IDs, and an XML document based on the XML Response schema that clients can use to see transmission result details and to update their internal systems.

The client may be required to resubmit data if any major errors occur.

For more information about Incident reporting visit <http://hazmat.dot.gov/enforce/spills/spills.htm>

## 3 Submission and Response Documents

### 3.1 Characteristics and Submissions

One incident only may be submitted per DOT Form 5800.1 XML document. Each submission should contain a client-generated tracking number for the client's internal tracking purpose. The submitted file may also contain information about the following:

- Multiple shippers
- Multiple materials per shipper
- Multiple packages and/or destinations per material
- Multiple package layers per package
- Electronic attachments to support the report

For security purposes, attachments can only be provided in the following file formats:

- *.pdf*
- *.txt*
- *.gif*
- *.jpeg*
- *.tiff*
- *.bmp*

The current XML schema definition for DOT Form 5800.1 is available for public download at <http://hazmat.dot.gov/enforce/spills/spills.htm>. Click on the *Download XML Schema* link under the section *Report Forms, XML*.

For XML Submission FAQ (Frequently Asked Questions), please click on *XML Submission FAQ* under the section *Report Forms, XML* also at <http://hazmat.dot.gov/enforce/spills/spills.htm>.

For XML Submission Process Flow, please click on *XML Submission Process Flow* under the section *Report Forms, XML* also at <http://hazmat.dot.gov/enforce/spills/spills.htm>.

For Sample XML Submission files, please click on *Sample XML Submission Files* under the section *Report Forms, XML* also at <http://hazmat.dot.gov/enforce/spills/spills.htm>.

### 3.2 Characteristics of the Response

For each XML submission, the filer will receive an e-mail response containing both business and XML data. The e-mail subject indicates the following:

- The filer's internal number for the incident,
- The status of the submission,
- The number PHMSA has assigned to the incident.

Following are the three possible transmission status values that could be provided in the subject:

- Submission Accepted
- Submission Accepted with minor errors
- Submission Rejected

The body of the e-mail will contain XML-formatted data corresponding to the XML schema for the Incident Report response. The initial part of the XML Response will include the following:

- Customer's Internal Tracking number.
- The Incident Report number assigned by PHMSA if the XML submission is accepted with or without minor errors.
- The PHMSA Incident Tracking number and the actual Response if the XML submission is accepted with or without minor errors.
- The body also may contain a message defining any minor or major errors the XML Parser encountered while processing the XML file.

The response item is key in determining whether or not the file submitted was accepted by the HMIS system. There are three (3) possible response values:

- OK – indicates the report was accepted as filed by PHMSA
- WARNING – indicates the report was accepted with non-critical errors by PHMSA
- ERROR – indicates the file contained major error/s that caused a rejection in the submission

Major errors will cause the rejection of the submission whenever the XML Parser finds data integrity violations that cannot be resolved programmatically. For example, if "city" and "state" and "zip code" combination do not match or if the XML Report does not answer a required field such as "incident location," the filer will be prompted to resubmit the report and modify all of the missing or ambiguous data in its subsequent submission.

Although minor errors will be allowed, they will be reported back to the client whenever the XML Parser encounters optional data that does not conform to internal PHMSA business-rule requirements. The errors must not compromise the overall quality and usability of the Report. For example, when a "packaging type" was not specified, but data was submitted for "package construction" and "test information", or when the reported "quantity released" is greater than the reported "package capacity," the submission could be either discarded, in the case of non-mandatory fields, or automatically fixed by the XML Parser by manipulating data from other fields.

For a more detailed description of XML processing errors please refer to the link *XML Processing Error Messages* under the section *Report Forms, XML* at the Incidents and Reporting Requirements URL: <http://hazmat.dot.gov/enforce/spills/spills.htm>.

Sample e-mail response to XML submission are listed in the appendix – A.

## 4 Service Setup

### 4.1 Registration with PHMSA

HazMat carriers interested in taking advantage of the XML Submission service should contact PHMSA to register and obtain the technical information required. Alternatively, PHMSA may approach certain organizations with a high volume of incidents to raise awareness and offer this service.

For security purposes, companies (or a division within a company that files its incident reports individually) should contact PHMSA before it begins testing XML submissions. The filing organization should provide the following information at the time of registration:

- Company name
- Company street address
- Company city, state, zip code
- Transmitting computer/server IP address
- Primary contact name of individual responsible for XML file submissions
- Primary contact phone of individual responsible for XML file submissions
- Primary contact e-mail of individual responsible for XML file submissions
- Secondary contact name supporting XML file submissions
- Secondary contact phone supporting XML file submissions
- Secondary contact e-mail supporting XML file submissions

Once the company has registered, PHMSA will provide it with the PHMSA test system IP address for the sFTP site, the PHMSA test system, sFTP client-specific sFTP folder name, and a password.

### 4.2 Research and Development

Customers should prepare their internal systems to generate and submit XML Incident Reports conforming to DOT Form 5800.1 XML schema. During this process, clients can interact with PHMSA's technical and business specialists for guidance, support, and documentation.

Customers should visit PHMSA's Incidents and Reporting Requirements website at <http://hazmat.dot.gov/enforce/spills/spills.htm> to download the information under the *Report Forms* section. This information should prove vital for the development phase. The following documentation is available for download in the *XML* area:

- Click on *Download XML Schema* for the actual .xsd document with the current XML schema definition for DOT Form 5800.1.
- Click on *XML Processing Error Messages* for a detailed description of XML processing errors.
- Click on *XML Submission FAQ* for frequently asked questions.
- Click on *XML Submission Process Flow* to view the outline process flow of XML submission process.

- Click on *Sample XML Submission Files* to download the sample XML submission files.

As an extra step in making the development process less stressful for customers, PHMSA has created an XML Validator for Incident Reports. This utility helps developers find out about the quality of the XML documents against the XML schema. The utility quickly discovers errors until the Validator accepts the submissions. Only when the generated XML documents are accepted by the Validator can the customer proceed to the test phase. The XML Validator tool should be installed and executed locally. It can be downloaded from the Incidents and Reporting Requirements website by clicking on the *Verification* link and following the instructions on the page.

PHMSA encourages customers to develop their systems relying on the above documentation and PHMSA's personnel. This ensures a smooth test phase and compliance with PHMSA's Incident Report module throughout the development process.

### 4.3 Test

Customers ready to begin the test process should contact PHMSA to enable the carrier's account in the Test System.

To comply with DOT Security Guidelines, PHMSA requires that all XML transmissions be conducted utilizing Secure File Transfer Protocol (sFTP) on top of Secure Shell Protocol v2 (SSH2).

**Note:** This is NOT FTPs or FTP over SSL. The SSH2 protocol provides the services of server authentication, encryption, data integrity verification, and client authentication. PHMSA chose BitVise's WinSSHD as the SSH2 server over which to provide Secure FTP service. While BitVise offers a free SSH2 client application called Tunnelier, customers are encouraged to research and select their SSH2 product of preference.

The customer must first authenticate, establish, and close a secure tunnel before testing XML submissions. Any adjustments required to establish the communication between the two systems will be made at this time. PHMSA specialists will work with the client to help understand and solve any technical or business issues that may be encountered until the tests are satisfactory and submissions are safe to move to Production.

### 4.4 Production

Customer readiness to submit XML Incident Reports in Production depends on a number of factors. Both the client and PHMSA personnel will evaluate the results of the tests and determine a course of action. As a general rule, however, customers must meet the following criteria before switching to Production:

- Ability to send error-free XML documents.
- Ability to understand the errors sent back from PHMSA's XML Parser after a submission.
- Ability to correct the errors in order to resubmit, if required.

If the above conditions are met, PHMSA will activate the carrier's account in the Production System, and XML submissions can begin. Transactions will be closely monitored and reviewed, for a reasonable period of time. Then another review will be conducted to validate the decision. If excessive rejections occur, PHMSA may suspend the XML submissions for that customer and jointly revise the process with the customer until the major errors are rectified. If no important issues are encountered, customers can continue submitting DOT Form 5800.1 via XML to the Production System.

## 5 Contact Information

Customers interested in beginning submissions of HazMat Incident Reports via XML, or those in need of support are encouraged to contact the following people at PHMSA:

*Business Contact:*

Name: Felicia Boyd

HMIS Information Systems Manager

Email: [Felicia.Boyd@dot.gov](mailto:Felicia.Boyd@dot.gov)

Phone: 202-366-4994



Appendix – A  
Sample E-mail Response

- Sample E-mail response for XML submission accepted without any error or warnings

## Email Subject:

Response to Customer Tracking Number 2006011303: Submission Accepted

## E-mail body:

```

<IncidentReportResponse xmlns="http://hazmat.dot.gov/enforce/spills/spills.htm"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://hazmat.dot.gov/enforce/spills/spills.htm
IncidentReport.xsd">
  <CustomerTrackingNumber>2006011303</CustomerTrackingNumber>
  <IncidentReportNumber>X-2007010051</IncidentReportNumber>
  <IncidentTrackingNumber>409733</IncidentTrackingNumber>
  <Response>OK</Response>
</IncidentReportResponse>
```

- Sample E-mail response for XML submission accepted with warnings

## Email Subject:

Response to Customer Tracking Number 2006011303: Submission Accepted with minor errors.

## E-mail body:

```

<IncidentReportResponse xmlns="http://hazmat.dot.gov/enforce/spills/spills.htm"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://hazmat.dot.gov/enforce/spills/spills.htm
IncidentReport.xsd">
  <CustomerTrackingNumber>2006011303</CustomerTrackingNumber>
  <IncidentReportNumber>X-2006120033</IncidentReportNumber>
  <IncidentTrackingNumber>409659</IncidentTrackingNumber>
  <Response>OK</Response>
  <Message>
    <Type>MINOR</Type>
    <Text>Business rule: Single Packaging of package type NonBulk could not have
material of construction data for question 28. The material of construction data
for Single Packaging of package no.1 of material UN1919 is excluded from data
submission.</Text>
  </Message>
  <Message>
    <Type>MINOR</Type>
    <Text>Business rule: Single Packaging of package type PortableTank could not
have head thickness data. Head thickness data for Single Packaging of package no.2
of material UN1919 is excluded from data submission.</Text>
  </Message>
  <Message>
    <Type>MINOR</Type>
    <Text>Business rule: Shiper's city and postal code combination does not match.
</Text>
  </Message>
</IncidentReportResponse>
```

- Sample E-mail response for XML submission reject with major errors.

Email Subject:

Response to Customer Tracking Number 2006011303: Submission Rejected

E-mail body:

```
<IncidentReportResponse xmlns="http://hazmat.dot.gov/enforce/spills/spills.htm"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://hazmat.dot.gov/enforce/spills/spills.htm
IncidentReport.xsd">
  <CustomerTrackingNumber>2006011303</CustomerTrackingNumber>
  <Response>ERROR</Response>
  <Message>
    <Type>MAJOR</Type>
    <Text>Business rule: The response to question 26.a. for TankCar packaging
cannot be interpreted in accordance with current packaging standards established
in 49 CFR Section I, SubChapter C, Part 178. This violation causes the
rejection.</Text>
  </Message>
  <Message>
    <Type>MAJOR</Type>
    <Text>Business rule: The response to question 26.a. for
NonSpecificationPackaging packaging cannot be interpreted in accordance with
current packaging standards established in 49 CFR Section I, SubChapter C, Part
178. This violation causes the rejection.</Text>
  </Message>
  <Message>
    <Type>MINOR</Type>
    <Text>Business rule: Single Packaging of package type PortableTank could not
have head thickness data. Head thickness data for Single Packaging of package no.5
of material UN1919 is excluded from data submission.</Text>
  </Message>
  <Message>
    <Type>MINOR</Type>
    <Text>Business rule: Shiper's city and postal code combination does not match.
</Text>
  </Message>
</IncidentReportResponse>
```