Office of Hazardous Materials Technology

Standard Operating Procedures for the Evaluation and Issuance of Explosive Classification Approvals

January 8, 2010

1 INTRODUCTION

1.1 Purpose

This document outlines the standard operating procedures for the evaluation and issuance of Explosive Classification Approvals (EX Approvals) by the Pipeline and Hazardous Materials Safety Administration's Office of Hazardous Materials Safety (PHMSA). This document supplements PHMSA's programmatic document: *Approvals Program – Standard Operating Procedures.* The authority to issue such approvals is delegated to PHMSA by the Secretary of Transportation in accordance with the Federal hazardous materials transportation law (Federal hazmat law; 49 U.S.C. § 5101 et seq.) and the specific procedures for the issuance of EX Approvals are delineated in the Hazardous Materials Regulations (HMR; 49 CFR Parts 100-180). Prior to their transport in commerce, new explosives must be approved by PHMSA in accordance with 49 CFR 173.56.

1.2 Overview of Procedures

The procedures for issuing a new explosive classification approval as specified within the HMR are as follows:

1. In accordance with 49 CFR § 173.56, the applicant provides the new explosive to be tested to a testing agency that has been approved in accordance with 49 CFR Part 107 Subpart H;

2. The authorized testing agency performs the appropriate classification testing as required by 49 CFR Part 173 Subpart C and provides the results and recommended classification to the applicant;

3. In accordance with 49 CFR Part 107, the applicant provides all required information, including the testing agency's classification report, to PHMSA in accordance with 49 CFR § 173.56(b) and requests the new explosive classification be approved for transportation; and

4. PHMSA performs a technical review to determine that the proposed classification is correct based on the data provided. If satisfactory, the new explosive classification will be approved in writing and assigned an EX number.

2 Responsibilities

2.1 Applicant Responsibilities

The applicant must provide the testing agency a technical data package for each new explosive substance or article to be classified. The product data package must contain:

- A description of the explosive substance or article and its intended use;
- Chemical composition for an explosive substance or for all explosive substances used in an article;
- Net weight of all explosive substances;
- Engineering drawings of articles;
- A physical drawing or description of the proposed packaging if different from that authorized by the 49 CFR that includes the configurations (e.g., inner, intermediate and outer) and types (e.g., fiberboard, metal, wood, etc.) of packagings used.

The technical data package must be submitted to the authorized testing agency.

2.2 Authorized Testing Agency Responsibilities

The authorized testing agency's function is to examine the explosive substance or article and recommend a Class and Division to the applicant for submission to PHMSA. The authorized testing agency will review the applicant's data package to determine if the explosive substance or article should be classed by:

- Examination – Physical testing unless the explosive can be classified by analogy.
- Analogy - An explosive substance or article previously examined and classed by the authorized testing agency is determined to be similar in composition (for an explosive substance) or construction and function (for an article) that it may be classed with reduced testing or without testing. *NOTE: classification by analogy to a similar explosive material may only be performed when the authorized testing agency has previously examined and tested the explosive material to which the analogy is made and which was previously produced by that same manufacturer. One authorized testing agency may not recommend a classification by analogy to an explosive material examined and tested by another authorized testing agency, the U.S. Government or a foreign competent authority.*
- Alternative - PHMSA has determined through experience or other data that certain Class 1 articles may be classed based upon their design, explosive substance content and intended use (see 49 CFR 173.56(i). Such excepted articles typically contain explosive substances (e.g., Fireworks classed per American Pyrotechnics Association (APA) Standard 87-1) that are well characterized and are thoroughly understood by authorized testing agencies.

The authorized testing agency will document the selected method, provide a tentative shipping description for the explosive substance or article to be shipped to the authorized

testing agency if examination is required, and provide a recommendation to the applicant upon completion of the assessment.

2.2.1 Classification Recommendation Reports

The authorized testing agency shall prepare a separate classification recommendation report for each explosive substance, article or "family[1]" of articles or substances submitted by the applicant. The report shall contain at least the following information:

- A cover letter containing:
  1. Applicant Name
  2. Product Description
  3. Recommended Classification (UN Number, proper shipping name and compatibility group)
  4. Indication that the recommended classification is or is not packaging dependent

- A summary report describing the classing methodology used to classify the explosive substance or article (testing or analogy), results of any tests conducted or used for the analogous article, and an explanation of how the recommended classification was determined. A suggested format is provided in the Appendix.

In addition, the authorized testing agency may provide the applicant with an appendix to the summary report that provides detailed test data sheets, photographs and videotapes. This information may be requested by PHMSA to verify the classification recommendation.

[1] "Family" – Explosive substances may include similar chemical compositions or proportions and differing physical properties (e.g., particle size, grain diameter, tablet, wafer, etc.) Articles containing similar substances with less net weight of explosives than that tested (e.g., airbag inflators not to exceed a specific quantity of propellant of a given composition.) A "Family" may NOT include a non-specific listing of any or all possible chemical ingredients or compositions which could be used in the explosive material.

2.3 PHMSA Approval Responsibilities

A new explosive classification approval is required by PHMSA:

- prior to the first shipment of a new explosive substance, or a new article containing explosives within the U.S.;
- prior to the entry into the U.S. explosive substances or articles manufactured in foreign countries. The approval may be based on a Competent Authority Approval issued by a foreign government subject to review of its adequacy by PHMSA; and
- prior to shipment for explosive substances or articles granted a Hazard Classification by the Department of Defense (DOD) or Department of Energy (DOE).

2.3.1 New Explosive Classification

PHMSA reviews new explosive classification applications to verify and approve the classification as required by 49 CFR 173.56.

A request for classifying a material must be submitted by the manufacturer or by an individual who legally represents the manufacturer. Importers may be considered manufacturers for some imported explosives. Explosives, or materials that contain explosives, even though they may not intend to be used as an explosive, must be classed by PHMSA before they may be shipped to, from, or within the U.S. If an explosive substance or article from a manufacturer outside the U.S. has not been examined and classed by a Competent Authority of a foreign government (one that is acceptable to the Associate Administrator for Hazardous Materials Safety), the applicant must contact one of the authorized testing agencies to secure an evaluation and recommended classification. The applicant must then submit the recommended classification with all supporting data to PHMSA with an appropriate cover letter requesting an approved classification.

A new explosive classification approval, alternatively referred to as either a "Letter of Competent Authority" or an EX-Approval", is a document issued by PHMSA that certifies the explosive (substance or article) is properly classified in accordance with 49 CFR and UN requirements and is authorized for domestic or international shipment. Most new explosive classification approvals are for Class 1 materials, but a classification approval may also be given for substances or articles which contain such minimal amounts of Class 1 material that they are either assigned to another hazard class or designated as "not regulated as an explosive" by PHMSA.

As specified in 49 CFR 173.56(i), an authorized testing agency classification recommendation report may not always be necessary. PHMSA may directly assign a class and division if:

- The quantities of explosive substance to be transported may be so small that examination and testing would be impractical (e.g., larger amount required for examination than is planned to be shipped) or the shipment may be a one-time

occurrence (e.g., small quantity of a waste explosive laboratory reagent chemical to be transported to a disposal facility).

- The explosive material is uniformly dispersed in a very large quantity of liquid or solid desensitizing agent(s), (e.g., 99 percent or more non-explosive diluents, so that the overall mixture very likely will not meet the definition of a Class 1 explosive substance).
- There is a national or international security emergency such that the time for examination and class of the explosive substance or article by an authorized testing agency is not possible.
- The Associate Administrator for Hazardous Materials Safety approves the request acting as the Competent Authority for the U.S.

2.3.2 Application Processing

Once an application is received by PHMSA, the request is reviewed to determine if the application includes the information, documentation, and justification required, and whether the information is sufficient as required by 49 CFR Part 107 to conduct a full evaluation. When conducting this review, the Project Officer generates a new folder in the Approvals IT System. Standard Approval Process procedures are followed including populating the folder with all relevant application materials.

The applicant is responsible for putting together the approvals submission package to PHMSA and ensuring the application is organized so that the data for each explosive substance, article or family of articles submitted may be easily segregated and assessed. The explosive approval request submitted by the applicant to PHMSA must contain:

- The recommendation letter from an authorized testing agency;
- The authorized testing agency's recommendation report (if required);
- A table of explosive substances chemical compositions;
- Engineering drawings for articles showing explosive substance locations. The drawing or part number and a list of the weights of all explosives compositions or mixture contained in the article should be clearly identifiable;
- A single copy of the product data package; or
- A copy of a letter of a Competent Authority of a foreign government. If the explosive substance or article has been approved by the Competent Authority of a foreign government, the applicant shall submit copies of the Competent Authority classification letter and authorized testing agency classification recommendation report (English translation) to PHMSA for approval. If the Competent Authority of a foreign government is not known to PHMSA, the applicant may be required to provide a copy of the foreign government's documentation authorizing the individual or agency to act as a Competent Authority for the classification of explosives in that country or territory.

2.3.3 Technical Evaluation

The Project Officer completes an Application Completeness Form and forwards the application via the Approvals IT System to a Technical Officer (Chemist) in the Office of Hazardous Materials Technology. The Technical Officer evaluates the application, including drawings, test reports, and any additional information as required.

2.3.3.1 The Technical Officer evaluates the classification request for technical completeness taking in account the following information:

1. Does the product name, part number or drawing number for the explosive substance or article correctly correspond to the supporting documentation?

2. Is there a complete summary table for all explosive compositions contained in the explosive substance or article, the percentages by weight shown and the composition of all mixtures specifically enumerated?

3. Are there clear and legible engineering drawings in 8.5 x 11 in. format (or acceptable electronic files) of all the explosive articles with names, product numbers or drawing numbers that correspond to the classification recommendation report?

4. What, if any, packaging instructions or recommendations are specified in the classification recommendation report?

5. What tests were conducted to support the classification recommendation report or Competent Authority document? If they were waived for any reason, are those reasons and supporting documentation clearly presented?

6. Were all UN tests conducted in conformance with the most current edition of the UN Test and Criteria Manual? Were they in conformance with the HMR requirements in 49 CFR 173.57 and 173.58?

7. Has the examination and classification recommendation report been signed by an authorized testing agency, or recognized Competent Authority or agency of a foreign government?

8. Have the explosive substances (e.g. solid propellants for rocket motors, explosives for warheads, detonators for ammunition, etc.) within articles been separately classed and previously approved? If so, what were these UN and EX-approval numbers?

9. Have any and all special provisions applicable to the UN numbers and proper shipping names been certified in writing by the authorized testing agency as having been met (e.g., Special Provision 103 for detonators and detonator assemblies, Special Provision 116 for detonating fuses, Special Provision 109 for rocket motors, Special Provision 51 for model rocket motors, etc.)?

10. Is the recommended classification, including UN Number, Proper Shipping Name, Hazard Division Number, and Compatibility Group Letter correct?

2.3.3.2 The Technical Officer evaluates the application to determine if the recommended classification is correct. The Technical Officer uses his or her professional judgment and the criteria specified in the HMR to make one of the following determinations:

1. Reject the application for incomplete information. If in the judgment of Technical Officer the necessary information can be readily obtained from the applicant, the Technical Officer may contact the applicant and request this information. This action will be recorded in the Application Evaluation Form. Alternatively, the application will be returned to the Project Officer via the Approvals IT System without approval.
2. Recommend denial of the application and document the justification.
3. Recommend approval of the application but modify the classification as authorized by 173.56(i).
4. Recommend approval of the application.

2.3.3.3 The results of the Technical Officer's evaluation are documented in the Application Evaluation Form and the Technical Officer drafts the justification language for the approval or denial letter.

2.3.3.4 The recommendation of the Technical Officer is then reviewed by the Supervisory Chemist who will concur with or revise the recommendation. If necessary, the recommendation will be reviewed by the Office Director. All actions are documented in the Approvals IT System.

2.3.3.5 Once the technical evaluation has been finalized, the Technical Officer moves the application into the Disposition Phase of the Application Action Process.

Appendix

SAMPLE AUTHORIZED TESTING AGENCY REPORT FORMAT

Authorized Testing Agency Report No.:

Sample Identification No.:

Sample Name:

Submitted by: Name
Address

Sample Description: Provide description of the explosive substance physical characteristics (color, state, etc.) and chemical composition. Provide a description of an article function, design and chemical composition of contained explosive substances. Drawings of an article should also be provided. Proposed packaging should also be described.

Method Used: Examination, analogy or alternative

Examination – Describe the test program conducted in detail. Specify any deviations or variations

Analogy – Describe the parent explosive substance or article in sufficient detail to allow a reader to understand the similarities between the explosive substance or article submitted and the parent explosive substance or article. Highlight specific differences and the rationale for assuming that the submitted explosive substance or article will behave similarly to the parent explosive substance or article.

Alternative - Specify the appropriate 49 CFR 173.56 subsection that applies to the recommended classification.

Results: Examination – Provide summary descriptions of each test and the results. The results should be described in terms consistent with the criteria of the UN Manual of Test and Criteria. A summary table of the test results is recommended.

Analogy – Provide a summary of the test results for the parent explosive substance or article with references.

Recommendation: Provide a class recommendation, proper shipping name and corresponding UN number. Describe the rationale used to arrive at the recommendation.