

# Transportation Safety Manual

Comments and questions regarding this manual should be directed to the contact person listed below:

Name: Jim Brazelton  
Supervisor, Packaging and Transportation

Address: 152 Spedding  
Phone: 515-294-4427  
E-mail: [brazelton@ameslab.gov](mailto:brazelton@ameslab.gov)  
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## Sign-off Record

**Approved by:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Andrea L. Spiker, Manager, Purchasing and Property Services

**Approved by:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Tom E. Wessels, Manager, Environment, Safety, Health & Assurance

**Approved by:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Mark L. Murphy, Chief Operations Officer

**Approved by:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Debra L. Covey, Sponsored Research Administration Associate Director

**Approved by:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Dr. Duane D. Johnson, Chief Research Officer

**Approved by:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Dr. Bruce N. Harmon, Deputy Director

**Approved by:** \_\_\_\_\_ **Date:** \_\_\_\_\_  
Dr. Alexander H. King, Laboratory Director

*Note: Original Sign-off Record with signatures is on file with ESH&A. This manual will be distributed via the Ames Laboratory Website.*

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### Revision/Review Log/Index

This document will be reviewed once every five (5) years as a minimum.

<u>Revision Number</u>	<u>Effective Date</u>	<u>Contact Person</u>	<u>Pages Affected</u>	<u>Description of Revision</u>
0	07/01/08	Jim Brazelton	All	Original Document (previously 58304.001)
1	11/01/10	Jim Brazelton	All	Major change to document Format, rev logs and Appendix G, Security Plan Assessment, ESHA:\Document Control\ Revision\ Description\ Manual\48303.001

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**QUICK REFERENCE - WHOM TO CALL**

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**General Information:** The Transportation Safety Manual contains general requirements for transportation of hazardous materials. For site and offsite shipments, refer to Chapters 7 and 8, respectively for more detailed instructions.

**For Emergencies: On-site 9 1 1**

**For On-Site Spills and Transportation Emergencies: 4-3483**

**For radioactive materials that are not waste:**

Contact Environment, Safety, Health and Assurance (ESH&A) **4-7926**

**For hazardous waste and mixed waste:**

Contact Environment, Safety, Health and Assurance (ESH&A) **4-7923**

**For hazardous materials that are neither radioactive nor waste:**

For Offsite shipments, contact Materials Handling Services for packaging assistance and completing the Ames Lab Shipping Order, form No. 58304.008 **4-6083**

For Site shipments, contact Materials Handling Services for packaging assistance  
**4-6083**

**Packaging and Transportation Supervisor: 4-4427**

Contact the Packaging and Transportation Supervisor if you have general questions or any safety concerns about transportation activities.

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## **Policy 48303.001**

### **"PROMULGATION OF THE TRANSPORTATION SAFETY MANUAL"**

It is the policy of the Ames Laboratory to prepare, handle, package and offer materials for transport in a manner which, when incidental to normal transportation activities, will communicate applicable hazards and provide containment of materials which may be capable of posing an unreasonable risk to the health, safety, environment, and property when transported.

This Transportation Safety Manual (TSM) has been prepared in accordance with the regulations and requirements of the U. S. Department of Energy (DOE) and other government regulatory agencies as directed by the Prime Contract with ISU. This TSM contains the Ames Laboratory safety requirements for the site and offsite shipment of hazardous materials.

Within the Ames Laboratory, the Laboratory director has ultimate responsibility for packaging and transportation safety. The responsibility for implementing the requirements contained in this TSM have been delegated to the Purchasing and Property Services Office. The Materials and Transportation Supervisor is responsible for the development and maintenance of this manual and the coordination of the implementation of its requirements.

Transportation safety is a line responsibility extending from the Laboratory director to the associate Laboratory directors, program directors, managers, and all employees. The responsibilities of each operating and service group and each individual involved in packaging and transportation of hazardous materials are delineated in the TSM.

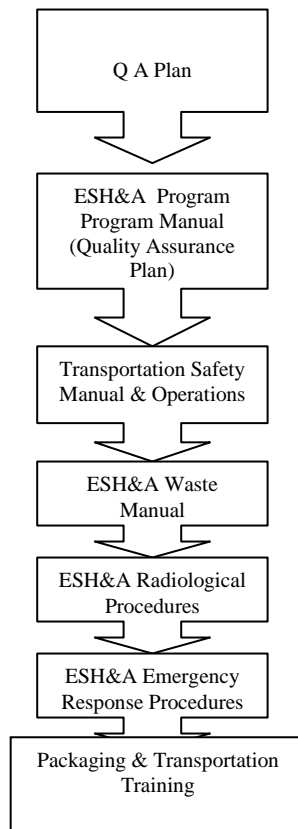
All programs and offices involved with the site or offsite shipment of hazardous materials shall comply with the provisions herein. Such compliance shall be demonstrated via a Quality Records and/or appropriate operating procedures, as directed by the ESH&A Program Manual.

**1.0 Chapter 1. Purpose, Scope, and Applicability**

- 1.1 This chapter defines the purpose, scope and applicability of the Ames Laboratory Transportation Safety Manual (TSM).
  - 1.1.1 Document compliance with the requirements of the Ames Laboratory Environment, Safety, Health and Assurance Program Manual.
  - 1.1.2 Affirm the requirement to comply with current 49 CFR (DOT), ICAO and IATA (and subsequent) as appropriate when making site and offsite shipments, and provide guidance to originators/requesters who wish to make site or offsite shipments of hazardous materials.
  - 1.1.3 Establish requirements for the packaging of shipments of hazardous materials and provide guidance to originators/requesters who wish to make site shipments of hazardous materials.
  - 1.1.4 Delineate authorities and responsibilities.
- 1.2 The TSM establishes requirements for site and offsite shipments of hazardous materials, hazardous substances and hazardous wastes.
- 1.3 The TSM applies to all Ames Laboratory divisions, programs and departments.
- 1.4 Movements of hazardous materials controlled by this manual:
  - 1.4.1 Site shipments of hazardous materials.
  - 1.4.2 Offsite shipments of hazardous materials.
- 1.5 Movements of hazardous materials not controlled by this manual:
  - 1.5.1 Intra-building movements of hazardous materials and wastes, which shall be administratively controlled by ESH&A.
  - 1.5.2 Intra-building movements of radioactive materials shall be administratively controlled by ESH&A.
- 1.6 The TSM establishes requirements for all Hazmat personnel involved with the site and offsite shipment of hazardous materials (See Figure 1, Hierarchy of Documents at Ames Laboratory).

Figure 1

**Hierarchy of Documents**





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## Procedure 48303.001

### 2.0 Chapter 2. Definitions

2.1 This chapter lists site-specific definitions applicable to transportation operations.

Acronyms: Refer to Appendix C.

Administrative control: the use of operating procedures and checklists, etc., to ensure that operations are conducted safely and consistently.

Ames Laboratory Site: Includes the Ames Laboratory warehouse, facilities, and buildings: Wilhelm Hall, Gilman Hall, Zaffarano Hall, Metals Development, Spedding Hall and TASF, as the core of permanent site facilities. The Ames Laboratory site is located on the Iowa State University campus, and includes space leased as needed in other Iowa State University facilities.

Commercial Drivers License (CDL): a license that operators of commercial motor vehicles are required to obtain with proper endorsements.

Commercial Motor Vehicle: defined as a motor vehicle that has a gross vehicle weight rating of more than 26,000 pounds or carries 16 or more passengers, or that carries hazardous materials in types and amounts that require vehicle placards (49 CFR 383-399).

Common Carrier: a transporter that accepts shipments for transportation from many individual shippers. For example, a parcel or trucking company that transports individual shipments by air or highway from the Ames Laboratory is a common carrier.

Dewar: Cryogenic container for liquid gases.

GSA: Government Services Administration.

Hazardous Material: as defined in 49 CFR 171.8 and are listed in 49 CFR 172.101.

Hazardous Materials: (for the purpose of this document) hereafter includes hazardous materials and hazardous substances. (See 49 CFR and Appendix F).

Hazardous Substances: as defined in 40 CFR 117 and are listed in the Appendix to 49 CFR 172.101.

Hazardous Wastes: as defined in 40 CFR 262.

Hazmat Employee: An employee who directly affects hazardous material transportation safety by preparing hazardous materials for transportation, loads, unloads or handles hazardous materials, is responsible for the safety of transporting hazardous materials or operates a vehicle used to transport hazardous materials.

IAC: Iowa Administrative Code

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IATA: International Air Transport Association

ICAO: International Civil Aviation Organization

IMDG: International Maritime Dangerous Goods Regulations

IMO: International Maritime Organization

Intra-Building Movements: are the movement(s) of hazardous materials within a single building or inter-connecting set of buildings. Intra-building movement(s) are not subject to the set of requirements of this manual; however, they shall be administratively controlled by Environmental, Safety, Health and Assurance.

Labels: are printed warnings that identify the hazard class or the nature of the hazard. Labels are placed on packages containing hazardous materials.

Markings: are written descriptive names, instructions, cautions, weights or specification marks or combinations thereof required by DOT and EPA regulations to be placed on the outside of packages of hazardous materials.

Offsite Shipment: is the transport of hazardous materials beyond the Ames Laboratory facilities by carriers other than the Ames Lab.

Onsite: is any area within the boundaries of a DOE site or facility that is fenced or otherwise access controlled.

ORM: Other regulated materials are any materials that are:

1. determined by the DOT to pose an unreasonable risk to health and safety when transported in commerce;
2. do not meet any of the other hazard class definitions; and
3. permitted by the DOT regulations to be reclassified as an "other regulated material." (49 CFR 173.500)

Originator/Requester: is the person or organization who owns the hazardous material and wishes to make a site or offsite shipment of the material.

Package: a single container of a hazardous material prepared in final condition for shipment, including both the hazardous material and the required packagings.

Packaging: the shipping container and other components (absorbents and cushioning) necessary to complete a safe package that is ready for transportation.

Packaging Requirements: the DOT regulations for offsite transportation that specify how packagings for hazardous material shipments must be designed, manufactured, filled and sealed.

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Point of Entry: for the Ames Laboratory site for non-bulk hazardous materials is the Ames Laboratory Warehouse, which can be reached from offsite via Kooser Road. Unless otherwise approved, all hazardous materials from offsite must enter the site via the point of entry for the Ames Laboratory.

Private Carrier: is a carrier that transports its own property in its own trucks. (i.e., Ames Laboratory truck in delivering hazardous materials to and from the warehouse and between site facilities).

Proper Shipping Name: means the name of the hazardous material shown in Roman Print (not italics) in the Hazardous Materials Table in 49 CFR 172.101 and IATA 4.2.

Public Access: areas are any areas that do not have controlled access.

Quality Assurance (QA): a system of administrative and technical checks and balances initiated to ensure that the specified requirements for an operation are met. The term includes other related terms such as "quality control" and "compliance inspection."

Quality Records: are documents which demonstrate and record compliance with quality requirements.

Reportable Quantity (RQ): a quantity of a hazardous substance that exceeds the amount specified for that substance in the Appendix to 49 CFR 172.101. EPA has determined that hazardous substances in quantities that exceed the RQ for that substance pose special risks that require regulation. The DOT regulations (and 49 CFR 171.11) include special provisions for transportation of a reportable quantity of a hazardous substance in any one package and EPA requires that any spill of a reportable quantity of a hazardous substance be reported to the National Response Center.

Routine Site Shipment: any site transport of hazardous materials other than intra-building movements. It involves activities such as packaging, marking, labeling, loading, cargo security, placarding, preparation of shipping documents and transportation of the material via any transport vehicle. Shipments will meet the offsite requirements of 49 CFR, when being transported between buildings or locations on the Iowa State University campus, which encompasses the Ames Laboratory permanent site and other leased space from Iowa State University, and transported by the Ames Laboratory commercial vehicle.

Shipment: any site or offsite transportation of hazardous materials and includes such activities as packaging, marking and labeling, cargo loading and unloading, cargo securement, placarding, preparation of shipping papers, and transporting the package or giving it to a carrier.

Shipper: the organization and/or person who offers a shipment to a carrier for transportation.

Shipper's Certification: is the statement on the shipping paper that an Ames Laboratory representative must sign for hazardous materials shipments. The required content of the Shipper's Certification is specified in 49 CFR 172.204 and IATA 8.1.4.1. Ames Laboratory policy concerning the Shipper's Certification is presented in TSM Section 7.11.3.

Shipping Description: includes only the proper shipping name, hazard class/division UN or NA

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numbers and packing group. All other information is referred to as notes and relative supplemental information (i.e., packaging information) and must be entered below/after the shipping description.

Shipping Paper: a bill of lading, manifest or other shipping document serving a similar purpose and containing the information required by 49 CFR 172.202 through 204 and IATA 8.0.

Site: the area of land that contains a DOE facility which is either owned or leased by DOE or the Federal Government. This land may be divided by public rights-of-way. Site is an applicable term for the Ames Lab facilities.

Site Shipment: the transport of hazardous materials between buildings or locations on the Iowa State University campus, which encompasses the Ames Laboratory permanent site and other leased space from Iowa State University, by the Ames Lab commercial vehicle.

Site Shipment Form: a shipping paper carried by the driver of an Ames Lab vehicle carrying hazardous materials. The list shall describe the hazardous material being carried; specifically, it will include, but not be limited to, proper shipping name, hazard class/division, ID number, packing group, amount (cylinder, gallons, pounds), emergency guide number, and emergency telephone number.

Transport or Transportation: any movement of property by any transport vehicle, and any loading, unloading, or storage incidental thereto (49 CFR 107.3).

Transportation Vehicle: any conveyance (motorized vehicle, railcar, aircraft, boat, barge, or seagoing vessel) used for the transportation of property.

Transportation Safety Manual (TSM): this document, which contains, explicitly or by reference, documentation that implements DOE policy (per prime contract) for the safety of offsite shipments and site shipments of hazardous materials.

UN: United Nations identification number (REF: 49 CFR 172.101[e]). This number is found in Column 4 of the Hazardous Materials Table, 49 CFR 172.101 and column A in IATA 4.2, is used for Emergency Response.

Vehicle Placards: diamond-shaped hazard communication devices mounted on transport vehicles carrying hazardous materials to identify the nature of the hazard. Vehicle placarding requirements are addressed in TSM Section 7.12.

Work in Progress: the onsite movement of hazardous material by a trained and qualified person in the course of performing an assigned task where the material will be used and consumed by that person in the course of completing the task (e.g., by a painter or millwright moving supplies to a job site).

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## **Procedure 48303.002**

### 3.0 **Chapter 3. Site Description**

- 3.1 This chapter identifies the Ames Laboratory site and associated facilities.
- 3.2 The Ames Laboratory site (for purposes of defining site) is completely unfenced and includes roadways to which the public has unlimited access. The site is located on the campus of Iowa State University, in the City of Ames, Story County, Iowa.
- 3.3 Since there are no controls on public access to the Ames Laboratory facilities, the term "onsite" is not applicable and the term site is used in this TSM in association with hazardous material transport between Ames Laboratory buildings/facilities. All packaging and transportation procedures required by this TSM will be completed as if offsite and applicable to all exceptions and regulations set forth in 49 CFR. Site shipments will be prepared as if they were offsite shipments, with the proper exceptions to 49 CFR while transported by DOE Contractor commercial vehicles as a private carrier.
- 3.4 Refer to site map/references, Appendix B.

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## Procedure 48303.003

### 4.0 Chapter 4. Organizational Responsibilities

4.1 This chapter describes the packaging and transportation organizational structure.

4.2 Laboratory Director is responsible for establishing transportation safety policy and approving the TSM and changes, thereto.

Via Laboratory Director, Purchasing and Property Services Office, is responsible for coordinating and distributing the Ames Laboratory Transportation Safety Manual and assuring that it is current and fulfills the needs of the Laboratory. This responsibility includes:

- a. classification, packaging, shipping of hazardous materials offsite.
- b. receipt, interim storage, and site distribution of inbound hazardous materials.

Environmental Safety, Health and Assurance is responsible for the packaging of radioactive materials, carrying out intra-building movements of radioactive materials and hazardous wastes, and preparing radioactive materials and hazardous wastes for offsite shipment.

4.3 Purchasing and Property Services Office is responsible for the Transportation Safety Manual, and the coordination of its implementation; monitoring Packaging and Transportation Policy and Procedures; and performing surveillances to ensure compliance with the requirements of this manual. The Packaging and Transportation supervisor (trained) is authorized to sign DOT shipping papers for the Laboratory and may delegate this responsibility to trained personnel.

4.4 Materials and Transportation Services is responsible for maintaining records on all vehicles provided by GSA for use and is responsible for making arrangements with GSA and GSA contract service centers for vehicle maintenance and informing the Ames Laboratory vehicle users when scheduled preventive maintenance is required.

4.4.1 Materials and Transportation Services has several key responsibilities related to hazardous materials transportation. These include:

- a. Operation of the shipping/receiving facility in the Ames Laboratory Warehouse. This facility ships and receives both hazardous and non-hazardous materials for Ames Laboratory.
- b. Site delivery of hazardous materials.
- c. Operation of the Storeroom in Spedding Hall.
- d. Operation of the Storeroom and the compressed gas storage area in the Ames Laboratory Warehouse.
- e. Operation of the Ames Laboratory vehicles designated for use in hazardous materials transportation.

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- f. Retention of appropriate records on each hazardous materials shipment sent or received by Ames Laboratory, with the exception of hazardous waste records, which are maintained by Environment, Safety, Health and Assurance.
- 4.5 Environment, Safety, Health and Assurance and Group Leaders provide technical assistance to the support services. In addition, the ESH&A maintains radiation survey instruments, and conducts radiation surveys.
- 4.6 Program Directors are responsible for assisting in the offsite shipment of hazardous materials which originate in their programs and service area(s). (See Originator/Requester). Usually, the program requesters are the best resource for providing technical information about hazardous material properties, etc.; accordingly, Group Leaders shall support the hazardous materials transportation program by providing technical assistance, such as chemical analysis of hazardous materials, and applicable data to obtain a DOT hazardous materials “proper shipping name” and packing group, when requested.
- 4.7 The originator/requester identifies the material, the amount of material to be shipped, and the hazards associated with the material, and provide this information to Materials Transportation Services (4-6083). After determining the proper hazard class, Materials Transportation Services will provide guidance and/or assistance in the preparation of The Ames Laboratory Shipping Order to have the material shipped. Prior to initial packaging of non-clear packagings, call the Packaging and Transportation Manager (4-4427) [See 7.1.1.].
- 4.8 Environment, Safety, Health and Assurance, in compliance with this manual, performs the packaging of radioactive, hazardous and mixed waste for site shipments; prepares radioactive, hazardous, and mixed waste from pickup points in various buildings and Waste Storage facilities for temporary storage prior to shipment to offsite waste repositories, and prepares solid and liquid radioactive materials for offsite shipment.
- 4.9 Facilities Services Group maintains the Laboratory’s Emergency Plan.

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## Procedure 48303.004

### 5.0 Chapter 5. Site Specific Standards, Requirements, and Procedures

- 5.1 This chapter identifies site-wide standards, requirements and procedures.
- 5.2 Ames Laboratory policies and procedures for packaging and transportation of hazardous materials are required to be in conformance with external regulations established by a variety of Federal, State agencies. Appendix A, External Regulations and Industry Standards identifies accepted industry standards and specifications with which Ames Laboratory complies.

References to specific regulations are made, where appropriate, in the chapters of this Transportation Safety Manual (TSM) that deal with specific issues.

- 5.3 Packaging and transportation of hazardous materials must be in compliance with the safety requirements of the Ames Laboratory Environment, Safety, Health and Assurance Program Manual, and this TSM.

5.3.1 Offsite shipments must comply with the requirements of 49 CFR 171-180 and IATA.

5.3.2 Site shipments must be in compliance with offsite requirements or using applicable exceptions to 49 CFR 171-180 and IATA.

The following are specific site requirements:

**Packaging Standards:** Standards will be established by use of the current 49 CFR, ICAO, or IATA Regulations, as applicable per shipment.

**Performance Criteria:** Package integrity is the preferred way to ensure overall safety; however, an integrated approach, which considers containment (packaging) in combination with specified (49 CFR, ICAO or IATA) communication and control measures.

**Packaging Quality:** Performance Oriented Packagings and radioactive material packagings quality will be assured by complying with 10 CFR 830, Subpart A.

**Load Compatibility:** Shall meet the safety requirements of 49 CFR 177.848.

**Radiation Level**

**Limitations:** Radiation levels of packages of radioactive materials shall not exceed the limits specified in 49 CFR 173.441 and IATA 10.0.

**Criticality Control for Materials in Transit:**

Shall comply with the safety requirements of 49 CFR 173.453 through 173.459.

**Placarding:** Shall meet the safety requirements of 49 CFR 172.500.



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**Security:** Ames Laboratory hazardous material facilities will be secured at such a level as required by the security level issued by ESH&A. Special security checks for drivers and vehicles will be conducted during the initiation of transport and recorded in quality records for shipments of radioactive materials, wastes and placardable shipments. Procedures will prevent unauthorized personnel access to hazardous materials while in transportation as described in this TSM Ch. 15.

**Hazardous Materials**

**Site Shipment Forms:** The driver of site vehicles carrying hazardous materials shall carry a hazardous material site shipment form and have the form readily available on the seat next to the driver) for use in an emergency. The list shall contain: quantity, type of container (box, drum, cylinder), proper shipping name, hazard class/division, ID number. Packing group number, gross mass (pounds), Emergency Response Guide Number and Local Emergency Telephone Number. After all items are delivered, the cargo list shall be returned to the Ames Laboratory warehouse and retained for 30 days. After 30 days, the list may be destroyed.

**Speed Limit:** Vehicles carrying hazardous materials on the site shall be limited to the posted speed limit, or 25 mph, whichever is less.

**Vehicles:** Drivers shall inspect vehicles daily to be certain that they are in good operating condition. Inspection results shall be recorded on the "Driver's Daily Commercial Vehicle Inspection Checklist" and filed daily in the Ames Laboratory warehouse. (See Appendix F).

**Private Vehicles:** Use of private vehicles, including bicycles, is prohibited for the transportation of hazardous materials in quantities exceeding correctly packaged small quantities (49 CFR 173.4)/excepted (IATA 2.7) quantities.

**Passenger Aircraft:** Hazardous Materials may not be hand carried on or checked in baggage on commercial flights. (see IATA 2.3A)

**5.4 Federal Regulations**

Ames Laboratory is subject to Federal regulations concerning hazardous materials transportation established by the U. S. Department Transportation (DOT), the Environmental Protection Agency (EPA), the Occupational Safety and Health Administration (OSHA), and by Orders of the U. S. Department of Energy (DOE) that apply to contractor-operated DOE facilities by contract.

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## Procedure 48303.005

### 6.0 Chapter 6. Methodologies for Package Evaluation

- 6.1 This chapter describes the methodology and approach to achieving and demonstrating compliance with the Ames Laboratory Transportation and Packaging Policy.
- 6.2 Site shipments: It is Ames Laboratory policy that site hazardous materials packaging and transportation operations using GSA vehicles within DOT jurisdiction, operated by contractor personnel, require containment, communication, and control measures commensurate with the hazard of materials being transported. As a minimum, these measures shall include:
- 6.2.1 Packaging used for shipment of hazardous materials, shall, as a matter of policy, meet the requirements of 49 CFR 173.24(a) and IATA 5.0; i.e., each package shall be so designed and constructed and its contents so limited, that under conditions normally incident to transportation:
- a. There will be no significant release of the hazardous materials to the environment.
  - b. The effectiveness of the packaging will not be substantially reduced; and
  - c. There will be no mixture of gases or vapors in the package which could, through any credible spontaneous increase of heat or pressure, or through an explosion, significantly reduce the effectiveness of the packaging.
- 6.2.2 Communication (in the form of marking, labeling, or placarding) to personnel handling the material and to emergency responders, such that the hazards of the materials being transferred can be assessed prior to transfer and during, and after, incident response. The marking, labeling or placarding shall describe the hazards to alert bystanders or others who are not directly involved with the shipment.
- 6.2.3 Control (including procedures) appropriate for the level of containment and communication that take into account the probability of and consequences of accidents, as well as the route and time of transit. For all materials, personnel exposure shall be minimized in accordance with As Low As Reasonably Achievable (ALARA) principles. Control shall include the use of properly maintained vehicles operated by trained operators.
- 6.3 Reliance on packaging performance is the preferred way to ensure safety of site shipments. Adherence to Federal regulations (49 CFR, ICAO and IATA) applicable to offsite shipments of hazardous materials is an approved method to meeting these site shipment requirements. 10 CFR 830, subpart A, will be used for radioactive material packagings.
- 6.4 There will be no approval of non-certified packagings for materials requiring certified packagings.
- 6.5 Site packaging and transportation activities, including packages, will be subject to QA audits.
- 6.6 Packaging selection for radioactive and LLW radioactive wastes will be completed jointly with ESH&A and Packaging and Transportation manager.
- 6.7 A separate line item (standard text) will be entered on requisitions/purchase orders to require the receipt of package certifications.

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## Procedure 48303.006

### 7.0 Chapter 7. Routine Offsite Shipments

7.1 This chapter establishes requirements for routine offsite shipments of hazardous materials. Any site or offsite transportation of hazardous materials is considered a shipment, whether conducted by Ames Laboratory personnel or by an outside carrier.

**General:** For originators/requesters wishing to ship hazardous materials offsite:

**For radioactive materials that are not waste: 4-7926**

Contact Environment, Safety, Health and Assurance.

**For radioactive waste: 4-7923**

Contact Environment, Safety, Health and Assurance.

**For hazardous waste and mixed waste: 4-7923**

Contact Environment, Safety, Health and Assurance.

**For hazardous materials that are neither radioactive nor waste: 4-6083**

Contact Materials and Transportation Services. Complete the "Ames Laboratory Shipping Order," Form 58304.008.

7.1.1 **Packaging & Transportation Supervisor 4-4427**

Contact the P & T Supervisor if you have general questions or any safety concerns about transportation activities. If a material is to be sealed in non-clear containers, the P & T Supervisor should be called prior to sealing the container to verify the material for proper DOT certification.

**General:** For hazmat personnel involved in actual packaging, transporting, etc.

7.2 Offsite shipments of hazardous materials must comply with 49 CFR and the requirements of this Manual. Only specific modal trained employees may complete packaging of hazardous materials for offsite shipments.

7.3 Each originator/requestor wishing to make an offsite shipment of hazardous materials is referred to "Quick Reference - Whom to Call," in the front of this TSM. Originators must comply with the following:

7.3.1 Identify the material, the amount of material to be shipped, and the hazards associated with the material, and provide this information to Materials and Transportation Services (4-6083). After determining the proper hazard class, Materials Transportation Services will provide guidance and/or assistance in the preparation of The Ames Laboratory Shipping Order to have the material shipped. Prior to initial packaging of non-clear packagings, call the Packaging and Transportation Supervisor (4-4427) [See 7.1.1.].

7.4 All transportation of hazardous materials at Ames Laboratory, even transportation within the campus site, is considered to be offsite transportation, because there are no physical barriers preventing public access to the roads on the permanent site. There are no hazardous materials

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transfers at Ames Laboratory, only shipments.

The following examples illustrate typical Ames Laboratory shipments:

- a. Transportation of materials by Ames Laboratory vehicles on the Ames Laboratory site;
- b. Transportation of materials by Ames Laboratory vehicles between Ames Laboratory buildings and local offsite locations;
- c. Transportation of materials by common or contract carriers to offsite destinations.

Routine shipments are shipments prepared by Ames Laboratory personnel consisting entirely of materials in hazard classes that Ames Laboratory personnel are trained to handle (excludes explosives).

Descriptions and definitions of these hazard classes are provided in 49 CFR 173.115-156 and IATA 3.0.

All routine shipments by Ames Laboratory must be conducted in accordance with DOT Hazardous Materials Regulations (HMR) as presented in 49 CFR Parts 100 to 199. Exceptions to these regulations cannot be made without DOT approval.

## 7.5 Hazard Identification and Classification

Hazardous materials must be properly identified and classified to determine the applicable requirements for shipping those materials. Procedures for identifying and classifying hazardous materials shipments are presented in 49 CFR 115-156 and IATA 3.0.

Identification and classification of radioactive materials and wastes are addressed in chapter 14 of this Transportation Safety Manual.

7.5.1 DOT Hazard Classes: See 49 CFR 115-156

7.5.2 Proper Shipping Names: See 49 CFR 172.101, Hazardous Materials Table

7.5.3 Hazardous Materials Table: See 49 CFR

The Hazardous Materials Table in 49 CFR 172.101 and IATA 4.0, is the key to classifying materials and determining the applicable packaging requirements and exceptions, labeling requirements, and transport restrictions.

### 7.5.4 Classifying a Hazardous Material for Shipment

Classifying a material for shipment requires determination of the proper shipping name, identification number, and hazard class. This information is needed to specify the shipping description of the material, which is required on the shipping paper, and to determine the applicable packaging and hazard communication requirements.

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## 7.6 Packaging Hazardous Materials for Transportation

### 7.6.1 General Packaging Requirements

All hazardous materials must be packaged for transportation in accordance with the requirements of 49 CFR 173. The major design requirements for packaging are given in 49 CFR 173.24.

## 7.7 Hazard Communication Requirements

Hazard communication techniques are used to provide essential information to persons who handle a package during normal transportation and to emergency responders who deal with accident situations. Four basic types of hazard communication are required by DOT regulations. These are:

- a. Package markings: 49 CFR 172.300 and IATA 7.0
- b. Package labels: 49 CFR 172.400 and IATA 7.0
- c. Shipping papers: 49 CFR 172.200 and IATA 8.0
- d. Placards: 49CFR172.5

## 7.8 Shipper's Responsibility to Provide Emergency Response Information

7.8.1 The Ames Laboratory has an obligation to provide emergency response information with each shipment of hazardous materials made by the Ames Laboratory.

- a. Attach emergency response information to each shipping paper (this emergency response information must be cross-referenced to the UN and NA identification numbers shown on the shipping papers), or,
- b. Assure that the vehicle transporting the shipment contains a copy of the most recent edition of the DOT Emergency Response Guidebook.

7.8.2 Ames Laboratory policy meets these requirements in the following manner:

- a. Every Ames Laboratory vehicle used to transport hazardous materials should carry a copy of the latest edition of the DOT Emergency Response Guidebook. This DOT Guidebook is subject to the same accessibility requirements as those given for shipping papers. The most convenient method to meet these requirements is to leave the DOT Guidebook permanently in a holder mounted on the inside of the door on the driver's side of the vehicle.
- b. Whenever Ames Laboratory ships a package of hazardous materials by an outside carrier, Ames Laboratory personnel should determine if the driver is carrying a copy of the DOT Guidebook in the vehicle.
- c. If the driver has a copy of the DOT Guidebook in the vehicle, this satisfies Ames

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Laboratory's obligation to provide emergency response information.

- d. If the driver does not have a copy of the DOT Emergency Response (ERG) Guidebook, Ames Laboratory personnel should photocopy the appropriate pages of the DOT Guidebook for the materials being shipped (selected from the pages marked Guides 111 through 172 in the current ERG Guidebook); mark each page with the appropriate UN or NA identification numbers to which that Guide is applicable; and attach those pages to the shipping papers provided to the carrier.

#### 7.9 Transportation of Hazardous Wastes

Transportation of hazardous wastes is regulated by DOT and EPA. In Iowa, the administration of the EPA regulations has been delegated to the EPA, Region VII, Kansas City, Missouri.

#### 7.10 Transportation of Hazardous Wastes offsite to an Authorized Treatment, Storage, or Disposal Facility

Ames Laboratory has the responsibility under 40 CFR 262 to ensure that hazardous wastes generated at Ames Laboratory are transported to an authorized treatment, storage, or disposal facility. Hazardous wastes that are transported are required to be described on a special shipping paper, known as a hazardous waste manifest (Form 8700-22 or 8700-22A), in accordance with 40 CFR 262. This manifest creates a record that helps assure that the wastes are properly disposed of. This manifest serves as the shipping paper required under 49 CFR 172.200 through 172.205 and no other shipping paper is required.

#### 7.11 At the time of offsite shipment of hazardous materials departing the Ames Laboratory, Materials and Transportation Services shall forward DOT required Emergency Response Information (ref: 49 CFR 172.600), to the Environment, Safety, Health and Assurance Guard Station at G34-TASF.

#### 7.12 Security

Shipping personnel will observe vehicles prior to loading hazardous materials for foreign or suspect packages already on the vehicle prior to loading packages. Form 48304.015 will be completed prior to loading, securing the following information: carrier, driver's name, confirmation of U.S. citizenship, assurance of driver's CDL with hazmat endorsement, cell phone number and shipment tracking number. All unauthorized personnel will be kept away from hazmat storage areas used for preparation of packages and the vehicle is being loaded. Ch. 15 of this manual describes the Ames Laboratory Security Plan.

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## Procedure 48303.007

### 8.0 **Chapter 8. Non-Routine and Routine Site Shipments**

Non-Routine Shipments must be addressed to Environment, Safety, Health and Assurance and the Packaging and Transportation Supervisor for approval.

8.1 This chapter establishes requirements for routine site shipments of hazardous materials. (see Quick Reference - Whom to Call)

**General:** For originators/requestors wishing to make site shipments of hazardous materials:

**For radioactive materials that are not waste: 4-7926** Contact the Environment, Safety, Health and Assurance before movement of material.

**For radioactive waste: 4-7923**

**For hazardous waste and mixed waste: 4-7923**

Contact Environment, Safety, Health and Assurance.

**For hazardous materials that are neither radioactive nor waste:**

Contact Materials Handling Services **4-6083** for packaging assistance, and proper classification and documentation.

The Packaging and Transportation Supervisor has overall responsibility for implementing, coordinating, and monitoring Ames Laboratory transportation and shipping policies and procedures. Call the Packaging and Transportation Supervisor, (**4-4427**) if you have general questions or any safety concerns about transportation activities.

8.2 Site shipments of hazardous materials must be in compliance with DOE Order 460.1. Hazardous materials may **NOT** be transported by **private** vehicle including bicycles or carried aboard or checked with baggage on commercial passenger airlines. An Ames Lab vehicle and driver is available for transfers.

8.3 Each originator/requester wishing to make a site shipment of hazardous materials must comply with the following:

8.3.1 Identify the material, the amount of material to be shipped, and the hazards associated with the material. If there are any questions, call the Packaging and Transportation Supervisor (**4-4427**).

8.3.2 Packages may be walked (with the shipping order form attached) to Materials and Transportation Services in 153 Spedding.

8.3.3 Each package of hazardous materials, when being transported on site, must be marked with the building, room number, and name of person to whom the package is being sent, with the recipient's phone number.

8.4 Hazardous materials packaged to meet DOT requirements may be shipped on site without conferring with the Packaging and Transportation Supervisor or requiring shipping paper

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certification.

8.5 Unless otherwise approved by the Laboratory Director, **ALL** inbound, transported, non-bulk hazardous materials must enter the site via the Ames Laboratory Warehouse.

8.6 The receiving address is:

Ames Lab DOE Warehouse  
ISU Campus, 2405 Kooser Dr.  
Ames, IA 50011-3020

Hazardous materials may also be picked up by the Ames Laboratory materials handling vehicle and delivered direct to a requestor under the direction of the Ames Laboratory Warehouse/Materials and Transportation Services. Hazardous materials must be transported by Ames Lab hazmat personnel in an Ames Lab vehicle.

8.7 Security

During SECON 1 or 2 levels, all vehicle doors (passenger and cargo) are to be locked and additional awareness and attention paid to recognize unauthorized personnel (ch 15.2) and report any suspicious activity to the P & T supervisor or the plant protection section: 4-3483.



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**TABLE A: TYPICAL ROUTINE SITE SHIPMENTS OF HAZARDOUS MATERIALS**

<u>COMMODITY</u>	<u>FROM</u>	<u>TO</u>
ALL HAZARDOUS MATERIALS (EXCEPT WASTE)	AMES LAB WAREHOUSE	ALL FACILITIES
CRYOGENIC DEWARS	LOW TEMP FACILITY	ALL FACILITIES
	ALL FACILITIES	LOW TEMP
COMPRESSED GAS CYLINDERS	AMES LAB WAREHOUSE	ALL FACILITIES
	ALL FACILITIES	AMES LAB WHSE

**TABLE B: APPROVED HAZARDOUS MATERIAL RECEIPTS, BULK, WHICH ARE RECEIVED AND DELIVERED TO SITE LOCATIONS BY APPROVED VENDORS.**

<u>COMMODITY</u>	<u>CARRIER</u>	<u>FROM</u>	<u>TO</u>
LIQUID NITROGEN	VENDOR	VENDOR	LOW TEMP
LIQUID HELIUM	VENDOR	VENDOR	LOW TEMP WHSE

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## **Procedure 48303.008**

### 9.0. **Chapter 9. Personnel Qualification and Training**

- 9.1 This chapter outlines the training requirements for personnel involved with hazardous material packaging and transportation activities.
- 9.2 The Packaging and Transportation Training Program must provide Ames Laboratory employees sufficient information to work safely while protecting the safety and health of their co-workers, the public and the safety of the environment.
- 9.3 General packaging and transportation training requirements are established by the Laboratory, the Department of Energy, the Department of Transportation, OSHA, and the State of Iowa, and carrier association training.
- 9.4 Personnel, including forklift operators, packagers, and truck drivers, must have completed required training prior to assuming unsupervised responsibilities involving hazardous materials. Training shall consist of:
- 9.4.1 DOE courses which are required of all personnel, and Packaging and Transportation required courses.
- 9.5 In addition, personnel must be trained to applicable portions of:
- the operating procedure(s) to be used.
  - documentation and record keeping.
  - Ames Laboratory Transportation Safety Manual.
  - 49 CFR, 10 CFR, 40 CFR, ICAO/IATA, IMO/IMDG (as appropriate).
  - DOE Orders.
- 9.6 The ESH&A Training Department is responsible for providing support to the Packaging and Transportation Training Program in its inclusion to the General Employee Training (GET) module and the Training Needs Questionnaire (TNQ) for identifying hazmat employees and notifying hazmat employees of recurrent training due.
- 9.7 Personnel must receive training prior to assuming unsupervised responsibilities, then again, at least, every three years, including Hazmat Security Awareness and in depth Security Training for highway shipments and every two years for function specific shipments by air.
- 9.8 Certified hazardous waste employees will be trained onsite for the use of Special Permits for packaging hazardous waste, as required by each Special Permit.

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## **Procedure 48303.009**

### 10.0 **Chapter 10. Documentation and Record Keeping**

- 10.1 This chapter outlines the documentation and quality records requirements to support the Packaging and Transportation Safety Program.
- 10.2 All quality records shall be maintained as required by appropriate DOE Orders, Federal regulations or this manual. Records shall be available for review by oversight personnel.
- 10.3 Records of routine site shipments, including the required hazardous materials site shipment form, No. 48303.001, shall be retained long enough to complete shipments, after which they may be destroyed.
- 10.4 The Purchasing and Property Services Office is to retain a copy of purchase orders, DOT-UN certificates of compliance, and receiving inspection checklists for three (3) years.
- 10.5 Driver requirements are found in the ESH&A Program Manual in 5.0 and 5.21.
- 10.6 DOT shipping documents will be retained and available for 24 months.
- 10.7 Hazardous waste manifests will be retained and available for 36 months.

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## **Procedure 48303.010**

### **11.0 Chapter 11. Occurrence Reporting and Emergency Response**

- 11.1 This chapter outlines the reporting requirements for transportation and security occurrences involving hazardous materials.
- 11.2 Investigation and reporting of accidents is performed by Environment, Safety, Health and Assurance. They will also review and coordinate proper corrective actions with program directors and department heads.
- 11.3 Offsite shipments shall comply with the emergency response information requirement of 49 CFR 172.600 if applicable.
- 11.3.1 The Environment, Safety, Health and Assurance-Plant Protection Section has procedures for receipt and handling of incoming calls requesting information and/or assistance with Ames Laboratory shipments. At a minimum, these procedures shall include, and provide guidance for:
- a. Providing appropriate emergency response information.
  - b. Contacting key personnel.
  - c. Obtaining technical support.
- 11.4 Site Shipments by Ames Laboratory commercial vehicles shall be in compliance with the following emergency response information requirements:
- 11.4.1 In the event of a transportation incident, (such as a traffic accident, packaging incident, or leaking package or security concern), the driver or other person(s) observing the incident shall promptly notify emergency response personnel (via radio, or 515-294-3483 on the telephone.) The driver shall assist any injured personnel, give any requested information to emergency response personnel, and warn/attempt to keep persons away from any spill or containment breach.
- 11.4.2 The driver of a vehicle carrying site shipments of hazardous materials shall have the Hazardous Material Shipping Form immediately available in the cab of the transport vehicle. The purpose of the Hazardous Material Form is to identify the hazardous material on the truck at that specific time.
- 11.5 Occurrence reporting shall be in accordance with DOE and Ames Laboratory policy. See DOE 232.1A, "Occurrence Reporting and Processing of Operations Information," and "Ames Laboratory Environment, Safety, Health and Assurance Program Manual (1.6). Reporting of Events." State and Federal reporting will be completed by procedures outlined in Ames Laboratory's Emergency Plan, 46300.010, 4.03.
- 11.6 Packaging and Transportation incidents not meeting (less than) the reporting requirements of Ames Laboratory and DOE policy shall be noted and forwarded to the Packaging and Transportation Supervisor for review. It is important to review "near miss" or unusual

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occurrences situations to uncover aspects of the situation that, if not identified and corrected, can cause recurrence of the event, possibly with more serious consequences. The Packaging and Transportation Supervisor shall review "near miss" situations, as well as reported occurrences, not to place blame, but to recommend operational changes, etc., to reduce the possibility of additional occurrences.

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## Procedure 48303.011

### 12.0 Chapter 12. Transport Vehicle Operations

- 12.1 This chapter identifies transport vehicle maintenance, operation, loading, segregation, and inspection requirements. Driver or operator qualification and training are addressed in Chapter 10.
- 12.2 Offsite Shipments: Ames Laboratory vehicles used for the site and offsite shipment of hazardous materials shall be in compliance with the safety requirements of 49 CFR 171-180, 383-399, except that reports required by 49 CFR 394 shall be prepared by Environment, Safety, Health and Assurance.
- 12.3 Prior to daily operation, each vehicle used for hazardous material shipments shall be inspected to be certain they are in safe operating condition. The inspection shall be recorded on a "Driver's Daily Commercial Vehicle Inspection Checklist," a sample of which appears in Appendix G. The completed form shall be retained in the Ames Laboratory Warehouse; if there are any operational deficiencies, the vehicle shall not be used until deficiencies are corrected.
- 12.4 Drivers shall inspect packages for damage or leaks. If in doubt, the driver shall not load the cargo - the Environment, Safety, Health and Assurance shall be called at **4-7923**.
- 12.5 Passengers are not allowed in hazardous material vehicles, except as noted in 49 CFR 392.60.
- 12.6 Take all necessary precautions to protect containers of hazardous materials:
- a. set parking brakes to assure vehicle cannot move during the loading process.
  - b. do not use equipment which will damage containers while loading.
  - c. watch for signs of leaking or damaged containers, do not transport leaking or damaged packages/containers. (See Ref: When to Call)
  - d. No smoking when loading hazardous materials.
  - e. Secure all packages/containers in an upright position to prevent movement during transportation.
  - f. Never open a hazardous materials package between point of origin (loading) and destination.
- 12.7 Loading corrosive liquids:  
  
Never load corrosive liquids next to explosives, flammable solids or oxidizing materials.
- 12.8 Loading compressed gases/cryogenic liquids:  
  
Always place cylinders/dewars in upright position and fasten securely to the vehicle. Offsite shipments of cylinders may require special bracing, dependent on carriers' requirements.

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12.9 Loading poisons:

Never transport poisons or irritants on trucks with interconnections or transport in the driver's cab with food material for human or animal consumption.

12.10 Loading radioactive materials:

Never load radioactive materials with a combined transport index exceeding "50." This index indicates the degree of control needed during transportation.

12.11 Provide for proper Segregation and Separation in storage of Hazardous Materials (Ref: 49 CFR 174.81, Segregation Table for Hazardous Materials)

12.11.1 Shipping Paper Accessibility During Transportation

If a shipping paper is required under 49 CFR 172.200 to 172.205, the regulations of 49 CFR 177.817(e) control where the shipping paper must be kept during transportation. The driver must assure that the shipping paper is readily available to, and recognizable to, authorities in the event of an accident or inspection. The shipping papers for hazardous materials must be readily distinguishable from other papers kept together with them by tabbing them or having them appear first. The shipping paper must be stored as follows:

When the driver is at the vehicle controls, the shipping paper must be:

- a. Within arms reach while he is restrained by the lap belt; and
- b. Readily visible to a person entering the driver's compartment.

When the driver is not at the vehicle controls, the shipping paper must be:

- a. On the driver's seat in the vehicle.

At the time of shipment of hazardous materials departing the Ames Laboratory, Materials Handling Services shall forward DOT required Emergency Response Information (ref: 49 CFR 172.600) to Environment, Safety, Health and Assurance-Guard Station. After the shipment has been verified as received, the Materials Handling Services will remove the required Emergency Response information from the Environment, Safety, Health and Assurance-Guard Section.

12.12 Security

The vehicle is to be regularly checked for foreign or suspect packages before loading packages. During periods when SECON 1 or 2 is declared, all vehicle doors (passenger and cargo) are to be locked while vehicle is unattended.

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## Procedure 48303.012

### 13.0 Chapter 13. Receiving Hazardous Materials Shipments

All hazardous materials shipments received by Ames Laboratory must be handled properly to assure that the materials are safely placed in interim storage or delivered to their users. This chapter explains the procedures that Ames Laboratory must use in receiving hazardous materials shipments.

Ames Laboratory RECEIVING address: **Ames Lab – DOE Warehouse  
ISU Campus, 2405 Kooser Dr.  
Ames, IA 50011-3020**

#### 13.1 Inspection and Acceptance of Hazardous Materials Shipments Received by Ames Laboratory:

Packages containing hazardous materials delivered to the Ames Laboratory warehouse by outside carriers must be inspected by an Ames Laboratory hazardous material employee before signing the accompanying paperwork and accepting delivery. Packages that are leaking or damaged should not be accepted from the carrier, but should be handled in accordance with TSM Section 11.4.

The paperwork received with each hazardous materials shipment must be signed by the person who accepted the shipment.

#### 13.2 Inspection of Hazardous Materials Packages Transported by Ames Lab:

Hazardous materials packages transported in Ames Laboratory vehicles should be inspected as they are loaded onto the vehicle and as they are unloaded from the vehicle for delivery to the user. Any packages found to be leaking at any stage of delivery should be handled in accordance with TSM Section 11.4.

#### 13.3 Inspection and Acceptance Procedures for Gases and Pyrophoric Materials:

Special receiving procedures are used for packages containing gases or pyrophoric materials. Such packages may include cylinders of compressed and liquified gases and containers of solids or noncompressed liquids. All such packages should be checked for leaks before accepting the delivery from the carrier.

Special Procedure for Hydrogen Fluoride: (Ref: 46200.006, 6.2.3.5)

Before accepting the shipment of an HF gas cylinder, the warehouse shall: (1) verify that the HF cylinder contains only the amount of HF that is specified on the Purchase Order (25 lbs or less) and (1) check the cylinder for leaks using the portable HF detector. Any HF cylinder that arrives with an amount exceeding the allowable limit of 25 pounds or presents a detectable leak shall not be accepted from the shipper/carrier and immediately returned to the carrier/vendor.

Leaking cylinders should not be accepted from the carrier, but should be handled in accordance with TSM 13.6.

Packages containing gases or pyrophoric materials that are delivered to the Ames Laboratory



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Warehouse must be either delivered to their user or placed in the gas storage area. Transportation of these materials must be conducted in compliance with the applicable requirements of this TSM.

#### 13.4 Handling Compressed Gases and Cryogenic Liquids

All cylinder movement should be done with Material Handling equipment. Dewars of cryogenic materials must be on a base platform or cart with rollers. All cylinders must be securely fastened when in storage or transport. A cylinder may not be transported if the cylinder cap is missing or the cylinder is visually damaged in any way or the valve is not closed tightly (Ref: See Whom To Call).

13.5 Evaluation/confirmation of proper shipping name, hazard class, UN/NA number, marking and labeling should be completed on receipt of materials, so that proper storage and or site shipment can be completed properly.

#### 13.6 Handling of Hazardous Materials Packages Discovered to Be Leaking

Ames Laboratory must never knowingly transport or permit others to transport a package of hazardous materials that is leaking. Ames Laboratory procedures for dealing with leaking packages are based on 49 CFR 177.854.

If an outside carrier delivers a leaking package containing hazardous materials, Ames Laboratory should not accept the package from the carrier. However, Ames Laboratory personnel should not permit the package to be put back into transportation. Instead, Ames Laboratory should allow the carrier to move its truck to the nearest safe place on Ames Laboratory's property and remain there until the leak is topped or the material is repackaged. Ames Laboratory personnel should call **4-7923** to report the situation. The carrier is responsible for dealing with such a leak, but Ames Laboratory should provide assistance. The package should not be permitted to leave until it can be transported in conformance with DOT regulations. Carrier equipment that is contaminated should not be permitted to leave until properly decontaminated. Observations for damaged and suspect packages which may pose a security threat are to be made prior to unloading and accepting packages on Ames Lab property.

The same procedure described above should be followed if an Ames Laboratory employee or a carrier employee discovers any leaking package on the carrier's truck while the truck is on Ames Laboratory property, even if the leaking package is not being delivered to Ames Laboratory. Ames Laboratory must not knowingly permit such a leaking package to reenter transportation. Report all such situations by calling **4-7923**.

If a damaged package is received, and Ames Laboratory concludes that the package can be accepted without significant or undue hazard to Ames Laboratory personnel and property, Ames Laboratory may accept the package "as damaged." An exception describing the damage should be noted on the freight bill.

Both the carrier and the shipper should be notified as soon as possible in case of any package damage and/or apparent shipper violations, including any defective conditions of the transport vehicle.

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- 13.6 All packages should be inspected promptly upon receipt for damage or other evidence of possible leakage to ensure that any potential public exposure to hazardous materials will be identified and appropriate action can be taken and to expedite processing of loss and damage claims. All shipments of materials received should be inspected, if practicable, before the delivering conveyance departs. In every case, damage is to be photographed immediately. Visible damage must be noted on the carrier's delivery receipt prior to signing for receipt of goods. All visible damage should be reported to the delivering carrier by telephone or fax the same day. All goods must be inspected for concealed damage and the carrier notified within 15 days of receipt to ensure the carrier retains the burden of proof for claim settlements. Security observations must be made prior to unloading packages onto Ames Lab property.
- 13.7 Receiving Certified Packagings: Notification must be made to the requestor so that an inspection form can be completed. (Form No. 48303.013)
- 13.8 Upon receipt of a radionuclide shipment, notification is made by the receiving person to the RSO (4-7922) who monitors the package and its contents for contamination and to ensure that any existing radiation levels are within the regulatory requirements. Once the receipt procedure has been completed, ESH&A health physics personnel will hand carry to the user's laboratory. (Manual 10202.001)

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### Procedure 48303.013

14.0 **Chapter 14. Responsibilities for Transport of Radioactive Materials**

This chapter delineates responsibilities for the transport of radioactive materials at Ames Lab and references appropriate 49 CFR regulations for proper shipment. Many exceptions for quantity activity, marking, labeling, placarding, private carriers, and exclusive use are delineated and if used must meet all requirements of each exception applicability. See “definitions” in 49 CFR 173.403. This chapter complies with HM-230 – Hazardous Materials Regulations; Compatibility with the Regulations of the International Atomic Energy Agency, effective October 1, 2004, corresponding IATA requirements and DOE 460.2-1A.

14.1 Via this Ames Laboratory policy and the Ames Laboratory Program Manual, the surveying, classification, preparation, packaging, packaging procurement, labeling, communications and contracting for the transport of radioactive materials is to be completed by Environment, Safety, Health and Assurance. Shipping papers will be prepared by Materials Handling with the appropriate information provided by ESH&A, while following the Ames Lab Radiation Safety Manual, 10202.001, Chapter 8 (Security, Storage and Transfer).

14.2 The survey, evaluation and identification of radioactive material to determine whether or not it is a "special form" or "normal form" in Table 2 of Radionuclides in 49 CFR 172.101, will be used to determine the proper shipping name from the hazardous materials table in 49 CFR 172.101.

14.3 Packaging of radioactive materials will be determined by the use of 49 CFR 173.410 through 173.428 and IATA requirements, adhering to definitions, limitations, and exceptions listed, for shipment by highway and air.

The shipment of radioactive materials by air on FEDEX, will follow the instructions in the current IATA regulations, CH 10, “Radioactive Materials” and 49 CFR 171.11.

14.4 All packaging for radioactive materials will be designed for easy handling and proper securement in or on a conveyance during transport. General design requirements for radioactive materials is referenced and specified in 49 CFR 173.410 through 173.428. Authorized Type A packages and additional design requirements are listed in 49 CFR 173.415 and 173.412 respectively. Authorized Type B packages are listed in 49 CFR 173.416, and are rarely used at Ames Laboratory. Selection of packaging is to be made jointly by ESH&A and Packaging and Transportation personnel. (see 14.14)

14.5 Marking of the package must conform to the requirements of 49 CFR 172.300-308. Each package shall be marked with the proper shipping name, identification number, and type of packaging. Packages with a gross weight of more than 110 pounds must have its gross weight marked plainly and durably on the outside of the package.

14.6 The proper label to be used is established by using the table in 49 CFR 172.403(c) and 172.441 (fissile) if applicable. The transport index, radiation level at package surface and fissile criteria are used to determine label category. The contents, activity and transport index must be entered on the label by either manual or mechanical means by ESH&A personnel.

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- 14.7 The shipping paper for radioactive materials must contain the following: (re:49 CFR 171.10, 172.200-203 and IATA 10.8.)
1. Proper shipping name
  2. Hazard class number
  3. Identification number
  4. "Radioactive material" if not in proper shipping name
  5. Name of each radionuclide
  6. Form of the material
  7. Activity levels in units of becquerels
  8. "Highway Route Controlled Quantity" if appropriate
  9. Category of label applied (i.e. "Radioactive White I")
  10. Transport index if labeled radioactive II or III
  11. Fissile markings as may be required by 49 CFR 172.203(d)(17)
  12. or Criticality Safety Index marking.
  13. Exemption references, if any
  14. Emergency Response information reference and Emergency contact telephone number must be entered on the shipping paper.
  15. Complete form number 48303.011 – Radioactive Material Shipper Checklist (shipping papers & packages)
  16. Attach form number 48303.013 – shipment tracking worksheet.
- 14.8 The shipper's certification must be completed by trained personnel before the package can be accepted by the carrier for shipment.
- 14.9 Site shipments will be performed by Ames Lab personnel in an Ames Lab vehicle.
- 14.10 Before shipment and upon receipt of a radioactive shipment, a visual inspection of the packages should be performed to identify dents, flaking paint, debris, package orientation and any indication of leakage. A comparison of package count to the shipping papers should be made to ensure accountability.

Receiving Address for all Ames Laboratory Radioactive Materials:

Ames Lab – DOE Warehouse  
Radiation Safety Officer  
ISU Campus, 2405 Kooser Dr.  
Ames, IA 50011-3020

- 14.11 Transport vehicles should be visually inspected prior to loading to ensure they are acceptable for the intended use. The vehicles should also be radiologically surveyed by ESH&A before loading for pre-use contamination, when using commercial highway carriers specializing in radioactive transport.
- 14.12 Transport of large volumes of LLW radioactive material by non-DOE vehicles should be "exclusive use" to prevent commingling of DOE and other commercial shipments.
- 14.13 Reporting LLW shipments to the state of Iowa, including prepayment of fees, are to be completed prior to shipping by ESH&A.

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14.14 Package specification for LLW package specifications will be reviewed prior to requisition of packages to assure they will meet criteria specified by receiving burial site requirements, and that they meet DOT requirements. Packaging certifications are to be entered as a separate line item on the requisition form. Package certifications are to be filed with the purchase order. After receipt of packagings, the packagings will be verified by the requestor, to be as requisitioned. All certified packages are to be reviewed with Packaging and Transportation prior to requisitioning. Packagings must be determined by using 49 CFR 173.427.

14.15 Packaging Acceptance Criteria:

Using criteria established by 49 CFR 173.410 (for IP I, II & III containers) or Waste acceptance criteria, using the most stringent, secure "as-built" drawings and test data which meet the packaging requirements.

After a review of the "as-built" drawings and test data for applicability to needs, place order for packagings (via purchase order system) with vendor. Assure that all relevant data is on purchase order to insure the receipt of correct packaging, as ordered.

Upon receipt of packagings, verify proper design criteria with "as-built" drawings and other data, to confirm receipt of packages as ordered, using Receiving Inspection form number 48303.013.

14.16 Security: (other than Exempt Concentrations and Exempt Consignments)(49 CFR 173.435).

Radioactive materials over "Exempt Concentrations" and over "Exempt Consignment" levels and less than Type A activities, require notification (FYI) to the Site Office Manager (CH), Type A activities require approval from the Site Office Manager and obtained by the Radiation Safety Officer.

**Notification and Approval Requirements:**

**SECON-3:** (Department of Homeland Security –[DHS] Threat Condition YELLOW):

Excepted, Limited Quantity and Type A activities require FYI notification to the SC Site Office Manager

Type B activities require SC Site Office Manager formal written approval.

**SECON-2:** (DHS Threat Condition ORANGE):

ANY quantity of activity (exempt, Limited quantities, Type A and Type B) being shipped requires approval of the Site Office Manager (request by email at least THREE days prior to shipment). The Site Office Manager is to notify the Chief Operating Officer (SC-3) at least TWO days prior to departure of shipments approved by the Site Office Manager. The Site Office Manager is to be notified by Ames Laboratory of package departure and arrival at destination. Additional tracking and communication with shipments enroute may be required as directed by the DOE Emergency Operations Center (EOC). Type B packages require formal written approval.

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**SECON-1:** (DHS Threat Condition RED):

ALL shipments of radioactive materials are FROZEN. Exceptions may be made on a case by case basis with Headquarters (SC-3) approval. Shipments in transit are to be located, but can proceed to the planned destination unless otherwise directed by the Site Office Manager (CH), DHS, or the DOE EOC.

Complete form number 48303.015, to secure the following information:

1. CH and/or SC shipment authorization
2. Carrier name
3. Carrier Driver's name and address
4. Assure U.S. citizenship of driver
5. Obtain copy of Driver's CDL (or confirmation by carrier)
6. Assure CDL is hazmat endorsed
7. Security inspection of vehicle
8. Cell phone or communication is available
9. Tracking number assigned to shipment
10. Other tracking devices, as necessary

Take digital pictures of completed package.

Complete form number 48303.009 – Package closure quality control.

Complete form number 48303.002 – Hazardous Waste Shipment & Security Checklist.

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## Procedure 48303.014

- 15.0 **Chapter 15. Transportation Security Plan**
- 15.1 This chapter is the Ames Laboratory Transportation Security Plan, as required by 49 CFR 172.800 (subpart 1). This plan was developed after completion of the DOT Risk Assessment. This plan contains elements to address personnel safety, unauthorized access to hazardous materials and en-route security. Each aspect is included in applicable chapters in this TSM. Reporting, follow-up and response is according to the Ames Laboratory Emergency Plan notifications. Ames Laboratory ships relatively small quantities of hazardous materials and bases this requirement on 49 CFR 172.800 (b) 7, quantities of hazardous materials that require vehicle placarding.
- 15.2 Job Applications: Ames Laboratory Human Resources will confirm information provided on job applications for those applicants who are seeking to be hired to perform jobs that involve access to or handling of hazardous materials that are covered by this security plan. This security plan covers employees who have access to or handle hazardous materials (i.e. packaging, marking, labeling, or driving and does not include laboratory security personnel).
- 15.2 Unauthorized Access and Unauthorized persons: Unauthorized persons are defined as any person who is not authorized to have access to or prepare hazardous materials for shipment. Unauthorized persons are not to be allowed in package preparation areas or in vehicle loading areas. (Ch 7.13, 8.7)
- 15.3 Non-routine and Routine Site Shipments: (Ch 8.7, 12.12)
- 15.4 Occurrence Reporting and Emergency Response to transportation security issues: (Ch 11.4.1, 11.5)
- 15.5 Responsibilities for Transportation of Radioactive Materials security and documentation: (Ch 14.16)
- 15.6 Site Shipments: The laboratory hazardous material delivery vehicle will have all cab and van box doors locked to prevent access to materials during periods of DOE SeCon 2 [or 1] (or Homeland Security level “High”) while the vehicle is un-attended (out of view of the driver).
- 15.7 Off-site shipments and interim storage of applicable hazardous materials: Employees, who ship quantities of hazardous materials meeting the placarding requirement, will use form 48303.015, Safety & Security Check for the Shipment of Radioactive & High Risk Materials. This form gathers information about driver’s citizenship and certifications, vehicle security checks, en-route communication methods and tracking methods. Form 48303.010 is used to follow up on scheduled deliveries and make notifications, if necessary. Physical separation of hazardous materials and unauthorized personnel will be performed at each shipping point. (Ch 7.13)
- 15.8 Enroute security will be preformed by completion of form 48303.015 or 48303.002 (as applicable) which records the following security information: carrier, drivers name, U.S. citizenship, copy of driver’s CDL, vehicle inspection for suspect packages prior to loading, methods to communicate with the driver enroute and shipment tracking numbers. (Ch 7.13)

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15.9 Personnel Qualification and Training: Training of hazardous material employees who will perform shipping functions of placardable shipments will be identified via the Ames Laboratory's Training Needs Questionnaire. Those individuals will be trained as required in chapter 9, with ALTRS training module AL-181, P&T Hwy and Air Security General Awareness.



**Appendix A. List of External Regulations and Industry Standards**

**EXTERNAL TRANSPORTATION REGULATIONS**

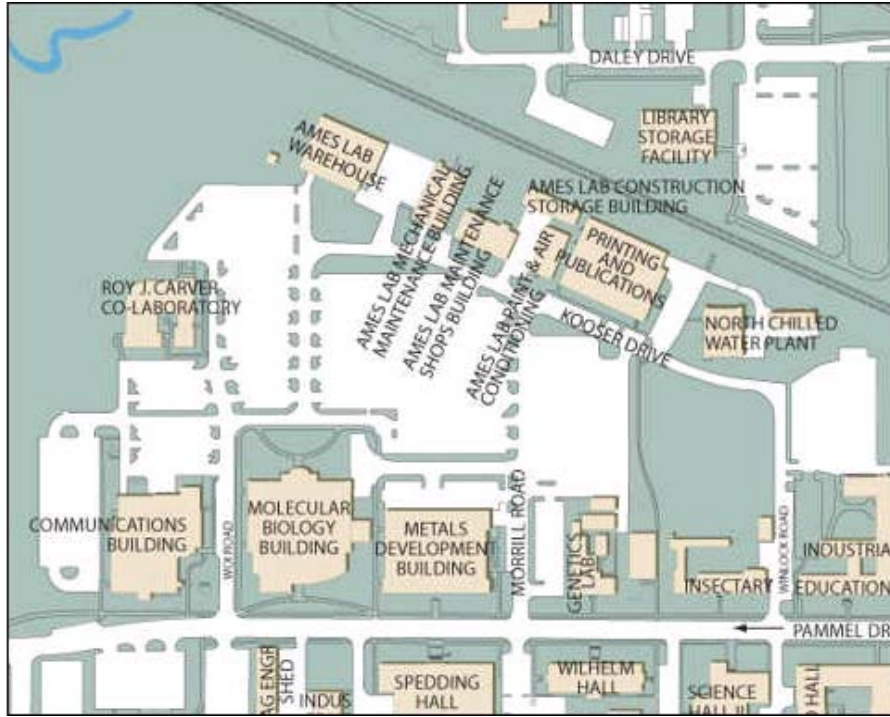
<u>REGULATION OR ORDER</u>	<u>SUBJECT</u>
10 CFR 830, Subpart A	Quality Assurance Criteria
49 CFR 171-180	Hazardous Materials Regulations (Oct 2002 and subsequent)
49 CFR 383.23	FMSCR – Commercial Drivers License
 <u>U. S. DEPARTMENT OF ENERGY (DOE) ORDERS</u>	
DOE Order 151.1	Comprehensive Emergency Management System
DOE Order 232.1A	Occurrence Reporting and Processing of Operations information
 <u>CODE OF IOWA</u>	
321.174-235	
321.252-562	Motor Vehicles and Law of the Road
 <u>IOWA ADMINISTRATIVE CODE</u>	
5657-132	Transportation of Radioactive Materials in Iowa

**INDUSTRY STANDARDS**

<u>ISSUING ORGANIZATION</u>	<u>TITLE</u>
Compressed Gas Association (CGA)	CGA Pamphlet C-6, Standards for Visual Inspection of Steel Compressed Gas Cylinders
	CGA Pamphlet P-1, Safe Handling of Compressed Gas Cylinders
	CGA Pamphlet S-1.1 Pressure Relief Device Standards – Cylinders for compressed gases.
	CGA Pamphlet S-1.2 Pressure Relief Device Standards- Cargo and Portable Tanks for compressed gases
	CGA Pamphlet S-1.3 Pressure Relief Device Standards- Compressed gas storage containers
International Air Transport Association (IATA)	Dangerous Goods Regulations (2003 and subsequent)

## Appendix B. Site Maps/References

### ISU Campus Site Map



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## Appendix C. Acronyms

This section defines all acronyms used in this Transportation Safety Manual. Some of these terms have also been defined in TSM Section 2.D.

ASC	Applied Science Center (ISU)
CDL	Commercial Drivers License
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CGA	Compressed Gas Association
CHEMTREC	Chemical Transportation Emergency Center (a service of the Chemical Manufacturers Association)
DOE	US Department of Energy
DOT	US Department of Transportation
EPA	US Environmental Protection Agency
ESH&A	Environment, Safety, Health and Assurance
FMCSR	Federal Motor Carrier Safety Regulations (see 49 CFR 383 to 399)
GSA	General Services Administration
GVWR	Gross Vehicle Weight Rating
HMR	DOT Hazardous Materials Regulations (see 49 CFR 100 to 179)
IAC	Iowa Administrative Code
IMO	International Maritime Organization
LLW	Low Level Radioactive Waste
MSDS	Material Safety Data Sheet
NA	North American (used in hazardous materials identification numbers)
NFPA	National Fire Protection Association
ORM	Other Regulated Material
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
QA	Quality Assurance
RCRA	Resource Conservation and Recovery Act
RQ	Reportable Quantity
RSO	Radiation Safety Officer
TSM	Transportation Safety Manual (this document)
UN	United Nations
US	United States



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## **Appendix E. Instructions for Completing Ames Lab Shipping Orders**

This form, dated December 2009, replaces all previous Ames Laboratory Shipping Orders.

This form must accompany all outbound packages being shipped offsite from the Laboratory.

This form can be used by Ames Laboratory or resident IPRT personnel. An Ames Laboratory account number (i.e. 10-101-999999) must be used. A Purchase order number is required for returns or shipments, which will incur a charge (repair, etc.). Both numbers are to be entered in the appropriate block on the Shipping Order. Pre-printed copies of this form and instructions are available in the Materials Handling Office, in 153 Spedding.

This form must be typed or computer generated. Only the original form is required. Distribution of copies will be accomplished by the Materials Handling Office after shipment.

Sections 1, 2, and 3 must be completed for all shipments (except section 3 for documents) or the package will not be accepted for shipment by the Materials Handling Office or the Warehouse.

Each requestor must be able to justify overnight shipment versus using the U.S. Postal Service. Statements concerning hazardous materials in section 3 must be completed for all non-document shipments and the Requestor Certification block must be signed by the requestor initiating the shipment.

The description shall include the quantity and complete name of the material, chemical or metal. Chemical symbols, formulas or trade names are not acceptable descriptions. Terms such as "samples for analysis" or "research specimens" will not be accepted for shipment.

Personal items are not authorized nor will they be accepted for shipment using this form.

All packages may be opened for inspection to assure that personal items are not included in the shipment, or that hazardous materials are properly communicated, documented and packaged.

Failure to declare any hazardous material could result in civil or criminal penalties by the U.S. Government of up to \$50,000 per person per day. Material Safety Data Sheets (MSDS) or applicable hazard information are to accompany materials for offsite shipment.

**Appendix F. Transportation Forms**

Part No.	Qty	Size	Description	PSN, HC, UN no., ERG no.	IPA #	From 011-Full-to IN-USE Serial Number	In-use to 011-EMT Serial Number	In-use to 011-EMT Serial Number	In-use to 011-EMT Serial Number
5		WQN	ERG 116						CV
0330272		K	Air, Compressed, (Breathing)	2.2, UN1002, ERG 122					CA
0331708		K	Air, Compressed, ( ZERO )	2.2, UN1002, ERG 122					CA
0330451		S	Argon, Compressed Ind.	2.2, UN1006, ERG 121					CA
0330400		K	Argon, Compressed Ind.	2.2, UN1006, ERG 121					CA
0330442		T	Argon, Compressed Ind.	2.2, UN1006, ERG 121					CV
0330353		K	Argon, Compressed, ( UHP )	2.2, UN1006, ERG 121					CA
0330396		T	Argon, Compressed, ( UHP )	2.2, UN1006, ERG 121					CV
0331406		K	P-10 Argon + Methane	2.2, UN1956, ERG 121					CV
0330507		K	Carbon Dioxide	2.2, UN1013, ERG 120					CA
0330701		H	Helium, Compressed (small)	2.2, UN1046, ERG 121					CA
0331759		K	Helium, Compressed ( ZERO )	2.2, UN1046, ERG 121					CA
0331724		T	Helium, Compressed ( ZERO )	2.2, UN1046, ERG 121					CV
0330728		Liter	Liquid Helium, -DEWAR	2.2, UN1963, ERG 120					
0330809		K	Hydrogen, Compressed (small)	2.1, UN1049, ERG 115					CA
0331805		K	Hydrogen, Compressed (ZERO)	2.1, UN1049, ERG 115					CA
0331201		K	Nitrogen, Compressed	2.2, UN1066, ERG 121					CA
0331694		T	Nitrogen, Compressed ( HP )	2.2, UN1066, ERG 121					CV
0340201		Liter	Nitrogen, Refrig.Liquid(DEWAR)	2.2, UN1977, ERG 120					
0331309		K	Oxygen, Compressed	2.2, UN1072, ERG 122					CA
			Propane, (small) (33lb)(TurboT)	2.1, UN1978, ERG 115					CV

## Appendix F. Transportation Forms (continued)

Export Review:

- Materials subject to EAR  
 Materials NOT subject to EAR

Initial and Date



**THE Ames Laboratory**  
*Creating Materials & Energy Solutions*

U.S. DEPARTMENT OF ENERGY

Operated by Iowa State University of Science and Technology for the United States Department of Energy

### SHIPPING ORDER

**Section 1: SHIPPING AND EMERGENCY INFORMATION**

Requested by:	Room / Building:	Employee ID:	Date:	Work Phone:
Ames Lab User Signature - Return Authorization	Purchased on PO Number:	Project Number:		Home Phone (Hazmat):
SHIP TO Contact:		Date Required at Destination:		Carrier Preference:
Company:		Reason for Shipment:		Work Order Number:
Address:		Vendor Return No. (RVA):		Vendor Contact Person:
City, State, and Zip Code:		Freight Charges: <input type="checkbox"/> Collect <input type="checkbox"/> Prepaid		Property Ownership: <input type="checkbox"/> Vendor <input type="checkbox"/> US Government
Contact Telephone:				

**Section 2: DESCRIPTION OF MATERIALS**

Item No.      Quantity      (Serial, property, vendor, catalog number, form of material, special handling instructions, export \$ value per item, ECOLL, etc.)


**Section 3: HAZARD IDENTIFICATION** – Check known or potential hazards in boxes below.

Completion of this section is not required for documents.		
<input type="checkbox"/> Flammable Gas	<input type="checkbox"/> Flammable Solid	<input type="checkbox"/> Poisonous Materials
<input type="checkbox"/> Non-Flammable Gas	<input type="checkbox"/> Spontaneously Combustible	<input type="checkbox"/> Infectious Substances
<input type="checkbox"/> Poisonous Gas	<input type="checkbox"/> Dangerous When Wet	<input type="checkbox"/> Radioactive
<input type="checkbox"/> Flammable Liquid	<input type="checkbox"/> Oxidizer	<input type="checkbox"/> Corrosive
<input type="checkbox"/> Combustible Liquid	<input type="checkbox"/> Organic Peroxide	<input type="checkbox"/> Miscellaneous
FAILURE TO DECLARE ANY HAZARD COULD RESULT IN CIVIL OR CRIMINAL PENALTIES BY THE U.S. GOVERNMENT.		

**REQUESTOR CERTIFICATION**

(Overtime delivery service must be justified if used versus not using the U.S. Postal Service. I certify that the above information is correct and that this shipment contains no personal property or materials).

Waybill Info:

Signature of Requestor \_\_\_\_\_ Date \_\_\_\_\_

**Section 4: FOR USE BY MATERIALS HANDLING PERSONNEL**

Packed by:	No. of Packages:	Type of Packages:	Gross Weight:
Shipped by:	Date Shipped:	Carrier:	Restricted: <input type="checkbox"/> Yes <input type="checkbox"/> No

ACCOUNTING – ORIGINAL      MATERIALS HANDLING – COPY      REQUESTOR – COPY      PACKAGING LIST – COPY      HAZMAT FILE – COPY

**Appendix F. Transportation Forms (continued)**

**Driver's Daily Commercial Vehicle Inspection Checklist**

Start Mileage: \_\_\_\_\_ Date: \_\_\_\_\_ License No: G43-49036

Repair Needed	OK	Inspection Item	Repair Needed	OK	Inspection Item
<input type="checkbox"/>	<input type="checkbox"/>	Oil Level	<input type="checkbox"/>	<input type="checkbox"/>	Lug nuts or Bolts
<input type="checkbox"/>	<input type="checkbox"/>	Coolant Level, Engine	<input type="checkbox"/>	<input type="checkbox"/>	Engine starting - Performance
<input type="checkbox"/>	<input type="checkbox"/>	Fuel - Adequate	<input type="checkbox"/>	<input type="checkbox"/>	Steering Assembly
<input type="checkbox"/>	<input type="checkbox"/>	Lights: Head, Tail, Marker	<input type="checkbox"/>	<input type="checkbox"/>	Leaks: Radiator Coolant
<input type="checkbox"/>	<input type="checkbox"/>	Mirrors	<input type="checkbox"/>	<input type="checkbox"/>	Leaks: Engine Oil
<input type="checkbox"/>	<input type="checkbox"/>	Horn	<input type="checkbox"/>	<input type="checkbox"/>	Leaks: Hoses or Hydraulics
<input type="checkbox"/>	<input type="checkbox"/>	Instruments	<input type="checkbox"/>	<input type="checkbox"/>	Transmission Operation
<input type="checkbox"/>	<input type="checkbox"/>	Windshield	<input type="checkbox"/>	<input type="checkbox"/>	Fire Extinguisher - Charged
<input type="checkbox"/>	<input type="checkbox"/>	Windshield Wipers	<input type="checkbox"/>	<input type="checkbox"/>	Emergency Equip.- reflectors
<input type="checkbox"/>	<input type="checkbox"/>	Service Brakes	<input type="checkbox"/>	<input type="checkbox"/>	Cylinder Tie-downs
<input type="checkbox"/>	<input type="checkbox"/>	Parking Brakes	<input type="checkbox"/>	<input type="checkbox"/>	Cargo Tie-downs
<input type="checkbox"/>	<input type="checkbox"/>	Tires	<input type="checkbox"/>	<input type="checkbox"/>	Radios Operational
<input type="checkbox"/>	<input type="checkbox"/>	Wheels & Rims	<input type="checkbox"/>	<input type="checkbox"/>	Other miscellaneous

End of Day Observations:

\_\_\_\_\_  
 \_\_\_\_\_

Current Day Driver's Signature: \_\_\_\_\_

Next Day Driver's Signature: \_\_\_\_\_

Emergency Telephone No: 515-294-3483



**Appendix G. Transportation Security Assessment**

**Ames laboratory DOT Hazardous Material Security**

**Risk Management - Self Evaluation, Scope of Operations – Assessment**

<b>Explosives:</b>	numerical rating: 0 = none, 10 = significant	
Hazard: Explosion as defined in 49 CFR 173.50		
Number of offsite shipments:		0
Size/volume of shipments:		0
Site security risk:		0
Risk to carriers:		0
Risk to consignees:		0
Risk to public:		0
Risk as terrorism material:		0
Programs/SMEs: None		

<b>Poison Gas:</b>	numerical rating: 0 = none, 10 = significant	
Hazard: Inhalation hazard as defined in 49 CFR 173.115		
Number of offsite shipments:		4
Size/volume of shipments:		1
Site security risk:		3
Risk to carriers:		1
Risk to consignees:		1
Risk to public:		1
Risk as terrorism material:		1
Programs/SMEs: Materials Preparation Center		

**Appendix G. Transportation Security Assessment (continued)**

<b>Non-Flammable Gas:</b>	
numerical rating: 0 = none, 10 = significant	
Hazard: Pressure hazard as defined in 49 CFR 173.115	
Number of offsite shipments: (empty cylinders)	1200
Size/volume of shipments:	1
Site security risk:	2
Risk to carriers:	1
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	1
Programs/SMEs: Supervisor, Packaging and Transportation	

<b>Flammable Gas:</b>	
numerical rating: 0 = none, 10 = significant	
Hazard: Flammability hazard as defined in 49 CFR 173.115	
Number of offsite shipments: (empty cylinders)	40
Size/volume of shipments:	1
Site security risk:	2
Risk to carriers:	1
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	1
Programs/SMEs: Supervisor, Packaging and Transportation	

**Appendix G. Transportation Security Assessment (continued)**

<b>Flammable Liquids:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Flammability hazard as defined in 49 CFR 173.120	
Number of offsite shipments:	15
Size/volume of shipments:	3
Site security risk:	1
Risk to carriers:	2
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	1
Programs/SMEs: ESH&A, Wastes	

<b>Flammable Solids:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Flammability hazard as defined in 49 CFR 173.125	
Number of offsite shipments:	100
Size/volume of shipments:	1
Site security risk:	1
Risk to carriers:	1
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	1
Programs/SMEs: Materials Preparation Center	

**Appendix G. Transportation Security Assessment (continued)**

<b>Spontaneously Combustible:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Explosion as defined in 49 CFR 173.125	
Number of offsite shipments:	0
Size/volume of shipments:	0
Site security risk:	0
Risk to carriers:	0
Risk to consignees:	0
Risk to public:	0
Risk as terrorism material:	0
Programs/SMEs: ESH&A	

<b>Dangerous When Wet:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Flammability hazard as defined in 49 CFR 173.125	
Number of offsite shipments:	10
Size/volume of shipments:	1
Site security risk:	1
Risk to carriers:	1
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	1
Programs/SMEs: Materials Preparation Center	

**Appendix G. Transportation Security Assessment (continued)**

<b>Oxidizers:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Explosion as defined in 49 CFR 173.127	
Number of offsite shipments:	0
Size/volume of shipments:	0
Site security risk:	0
Risk to carriers:	0
Risk to consignees:	0
Risk to public:	0
Risk as terrorism material:	0
Programs/SMEs: ESH&A	

<b>Organic Peroxides:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Explosion as defined in 49 CFR 173.128	
Number of offsite shipments:	0
Size/volume of shipments:	0
Site security risk:	0
Risk to carriers:	0
Risk to consignees:	0
Risk to public:	0
Risk as terrorism material:	0
Programs/SMEs: ESH&A	

**Appendix G. Transportation Security Assessment (continued)**

<b>Poison Solids and Liquids:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Flammability hazard as defined in 49 CFR 173.132	
Number of offsite shipments:	10
Size/volume of shipments:	1
Site security risk:	1
Risk to carriers:	1
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	1
Programs/SMEs: Materials Preparation Center	

<b>Infectious Substances:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Explosion as defined in 49 CFR 173.196	
Number of offsite shipments:	0
Size/volume of shipments:	0
Site security risk:	0
Risk to carriers:	0
Risk to consignees:	0
Risk to public:	0
Risk as terrorism material:	0
Programs/SMEs: Occ. Med.	

**Appendix G. Transportation Security Assessment (continued)**

<b>Radioactive Materials:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Ionization/Contamination hazard as defined in 49 CFR 173.403	
Number of offsite shipments:	8
Size/volume of shipments: (small –excepted packagings)	4
Site security risk:	1
Risk to carriers:	1
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	3
Programs/SMEs: ESH&A HP	

<b>Corrosive:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Destruction of Skin and Materials hazard as defined in 49 CFR 173.136	
Number of offsite shipments:	50
Size/volume of shipments: (small – 25)( large4)	4
Site security risk:	1
Risk to carriers:	1
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	1
Programs/SMEs: ESH&A Wastes	

**Appendix G. Transportation Security Assessment (continued)**

<b>Class 9 – Miscellaneous:</b>	numerical rating: 0 = none, 10 = significant
Hazard: Ionization/Contamination hazard as defined in 49 CFR 173.403	
Number of offsite shipments:	10
Size/volume of shipments:	4
Site security risk:	1
Risk to carriers:	1
Risk to consignees:	1
Risk to public:	1
Risk as terrorism material:	1
Programs/SMEs: ESH&A Wastes	



**Appendix G. Transportation Security Assessment (continued)**

**Assessment**

<u>Hazard Class</u>	<u>Rating (highest)</u>	<u>Risk to:</u>
Explosives	0	-
Poison Gas	3	Site
Non-Flammable Gas	2	Site
Flammable Gas	2	Site
Flammable Liquids	2	Carriers
Flammable Solids	1	All-Minimal
Spontaneously Combustible	0	-
Dangerous When Wet	1	All-Minimal
Oxidizers	0	
Organic Peroxides	0	
Poison Solids and Liquids	1	All-Minimal
Infectious Substances (A)	0	
Radioactive Materials	3	Terrorism
Corrosive	1	All-Minimal
Miscellaneous	1	All-Minimal

## Appendix G. Transportation Security Assessment (continued)

### STRATEGY

(≥1 rating)

<u>Hazard Class</u>	<u>Rating (highest)</u>	<u>Risk to:</u>
Poison Gas Poison gases are not shipped off-site, except for trace amounts in cylinders which it was last contained. Appropriated security controls are in place to limit access in research facilities and appropriate secure storage is utilized. Cylinders contain less than 14.7 PSI.	3	Site
Non-Flammable Gas The volume of non-flammable gas cylinders is perhaps the most significant factor non-flammable gas cylinders are returned to the vendor on vendor trucks and the cylinders contain only trace amounts of gas and are less than 40.6 psia. No terrorist security risk is expected with this classification of materials.	2	Site
Flammable Gas Flammable gas cylinders have appropriate security controls in the laboratory and the storage facility at the warehouse. These cylinders are transported by vendor truck for refilling. Cylinders have less than 14.7 psi and contain only trace amounts of flammable gas. The flammable gas storage area at the warehouse is designed to meet the CGA requirements and is in a locked area.	2	Site
Flammable Liquids The flammable liquids shipped by the Laboratory are shipped by Environment Safety and Health as RCRA wastes. These wastes are adequately secured on-site. These flammable materials may pose a larger threat to the carrier (contracted) who transports for disposal. The contract has been reviewed for safety and security performance.	2	Carriers
Flammable Solids Flammable solids are shipped as laboratory production materials, usually meeting. The small quantity designations using non-certified UN packagings. Most packages are transported by small parcel carriers.	1	All
Dangerous When Wet The volume of material per shipment is extremely small and poses minimal risk.	1	All
Poison Solids and Liquids These materials are extremely small in volume and in number of shipments per year. These materials are packaged extremely well and pose minimal risk.	1	All

## Appendix G. Transportation Security Assessment (continued)

<u>Hazard Class</u>	<u>Rating (highest)</u>	<u>Risk to:</u>
Radioactive Materials	3	Terrorism
<p>Radioactive isotopes are shipped by parcel carriers. Phone contact of receipt and shipping is performed for all shipments. Consignee licenses are obtained before shipping. Contract carrier evaluation is performed to assure safety and security during transport of low level wastes. Routing is determined before departure to minimize, where possible, the travel through downtown areas, populated areas, tunnels and bridges with minimal layovers during transport. Driver information is secured prior to arrival to pickup. Delivery is confirmed by phone contact with consignee at the pre-determined arrival date and time.</p> <p>Radioactive waste is shipped by contracted carriers. Phone contact of receipt and shipping is performed for all shipments (1/5 yrs). Consignee licenses are obtained before shipment. Contract carrier evaluation is performed by DOE to assure safety and security during transport. Routing is determined before departure to minimize, where possible, the travel through downtown areas, populated areas, tunnels and bridges with minimal layovers during transport. Driver information is secured before arrival for pickup. Delivery is confirmed by phone contact with consignee at the pre-determined arrival date and time. Emergency notifications are documented and reviewed with the driver prior to departure. All packages include tamper- indicating materials. Hazmat employees making these shipments have been trained and informed of any current security issues regarding the current shipment.</p> <p>After review of current procedures and documentation, the risk posed by these low-level materials is determined to be very adequate and minimizes security vulnerabilities, both on-site and off-site during transportation. Additional site-specific security training and testing of module 103, P&amp;T Hwy &amp; Air – Security General Awareness is performed.</p>		
Corrosive	1	All
<p>Shipment of corrosive materials from the laboratory is minimal. They are usually a subsidiary hazard with some gases. When those cylinders are shipped off-site, they are not full and contain only trace amounts of materials. Other corrosive solids and liquid materials are shipped in extremely low frequency. The risk associated with corrosive materials is minimal.</p>		
Miscellaneous Hazardous Materials	1	All
<p>Shipments of miscellaneous hazardous materials consist of only “Dry Ice”. That is only a hazardous material when shipped by air. Packaging is performed by IATA regulations and is in minimal quantities and poses minimal risk. Site and Off-site storage and transportation procedures are adequate for the risk involved.</p>		

