NASA Procedural Requirements

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COMPLIANCE IS MANDATORY

Requirements for Packaging, Handling, and Transportation for Aeronautical and Space Systems, Equipment, and Associated Components

Responsible Office: Logistics Management Division

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Preface

P.1 Purpose

a. This NASA Procedural Requirement (NPR) establishes packaging, handling, and transportation requirements adequate to maintain the reliability of NASA items and to achieve their damage-free delivery to the place and time of ultimate use. The purpose of this NPR is to promote a standard, streamlined approach for transportation shipment activities and to provide guidance for meeting packaging, handling, and transportation requirements pursuant to institutional, program, and project goals and missions throughout NASA.

P.2 Applicability

a. This policy is applicable to NASA Headquarters and NASA Centers, including Component Facilities, and to JPL and other NASA contractors to the extent specified in their contracts.

P.3 Authority

a. National Aeronautics and Space Act of 1958, as amended, 42 U.S.C. § 2473 (c) (l).

b. NASA Policy Directive (NPD) 6000.1, Transportation Management.

P.4 Applicable Documents and Forms

a. 10 CFR Part 71, Packaging and Transportation of Radioactive Material§

b. 49 CFR Subtitle B, Chapter I, Pipeline and Hazardous Materials Safety Administration, Department of Transportation.

c. Federal Acquisition Regulation (FAR), Subpart 46.407, Nonconforming Supplies or Services

d. NPR 2190.1, NASA Export Control Program

e. NPR 6200.1, NASA Transportation and General Traffic Management

f. Air Force Interservice Manual 24-204, Preparing Hazardous Materials for Military Air Shipments

g. Department of Defense Manual 4000.25-M, Defense Logistics Management System

h. Military Handbook 1791, Department of Defense Handbook, Designing for Internal Aerial Delivery in Fixed Wing Aircraft

i. Military Standard 2073-1, Department of Defense, Standard Practice for Military Packaging

j. Military Standard 810, Department of Defense Test Method Standard, Environmental Engineering Considerations and Laboratory Tests

k. Military Standardization Handbook 304, Department of Defense Handbook, Package Cushioning Design

l. National Aerospace Standards (NAS) 850 and 851, General Packaging Standard and Indexes

P.5 Measurement/Verification

None.

P.6 Cancellation

NPR 6000.1G, Requirements for Packaging, Handling, and Transportation for Aeronautical and Space Systems, Equipment, and Associated Components, dated 03/25/2005.

/S/
Dr. Woodrow Whitlow, Jr.
Associate Administrator for
Mission Support Directorate

Chapter 1. Basic Principles

1.1 Scope

1.1.1 This NPR defines general requirements for preservation, packaging, packing, marking, handling, transportation, and related data and documentation pertaining to all NASA-procured software and hardware items. For the purposes of this NPR, the definitions in Appendix A shall apply.

1.1.2 The requirements of this NPR do not supersede detailed NASA-approved preservation, packaging, marking, handling, and transportation specifications or procedures. Contractual provisions regarding supersession will apply. This NPR may be used as part of, or as a supplement to, other approved specifications or procedures. Appropriate sections of this publication may be incorporated by reference in a contract to spell out the obligations of the parties with respect to hazardous items, NASA critical item labeling, and special packaging, handling, and transportation data for mission-essential items.

1.1.3 When this NPR is incorporated contractually by reference, the procurement documents shall cite its title and date and, if desired, specific direction as follows:

a. Level of preservation and packaging and level of packing to be supplied (see section 2.1.).

b. Listing of items requiring a Packaging, Handling, and Transportation Record (see section 3.1.).

1.1.4. Specifications and procedures for preservation, packaging, packing, marking, handling, transportation, and related data and documentation shall be compatible with this NPR except to the extent that a deviation or waiver is approved in accordance with section 1.2. The mere citation of this NPR or the mere incorporation by reference of this NPR, or a part thereof, does not constitute compliance with any other applicable requirement that detailed or specific provisions be provided or stated in a particular document.

1.2 Deviation and Waiver Requests

1.2.1 Technical changes, deviations, or waivers sought from any requirement of this NPR shall be requested from, and approved in writing by, the applicable Transportation Office with final approval from the Agency Transportation Manager, Mission Support Directorate.

1.2.2 When requesting technical changes, deviations, or waivers, the requestor shall provide detailed justification outlining the uniqueness associated with their request, that timeline that the deviation and/or waiver is needed, program and/or project office supporting, Contract Number (if applicable), and suspense date needed for implementation.

1.3 Policy

1.3.1 General. Preservation, packaging, and packing should comply with the basic NASA objective of achieving adequate protection of the contained items at minimum cost. However, additional protection for items defined as mission critical may justify additional expenses. While needless expense should be avoided, protection for such items should clearly be sufficient.

1.3.2 Transportation Safety, Reliability, and Retention of Item Safety, Reliability, and Quality.

These shall be a major consideration in the development or selection of preservation, packaging, packing, marking, handling, and transportation approaches for mission-essential and/or sensitive items.

a. Each Center Transportation Officer or contractor shipping on behalf of NASA shall have a program establishing policies, procedures, and responsibilities for control of shipping and packaging requirements and procedures to achieve zero damage on delivery.

b. Regulatory and programmatic requirements shall be identified, met, and verified through NASA Center safety, reliability, and quality management processes.

1.3.3 Contingency Planning for Emergency Incidents. Due to the hazardous materials content of some critical space item shipments, it is prudent that all reasonable precautions be taken during movement of material. All shipments shall be in strict compliance with 49 CFR, Subtitle B, Chapter I, as well as applicable Center emergency response plans.

Chapter 2. Supplier Packaging Requirements

2.1 Selection of Packaging

2.1.1 Levels of preservation and packaging and the levels of packing to be applied selectively are defined in MIL-STD-2073-1 and are mandatory for use or when commercial packaging cannot provide adequate protection and preservation. Selection of levels shall be in accordance with the level selection chart Figure 1of MIL-STD-2073-1 and in Appendix A of this NPR. If military packaging is applicable, MIL-STD-2073 will further aid in the development of detailed requirements.

2.1.2 Selection of the levels of packaging and packing to be applied shall be the responsibility of the Center Transportation Officer unless levels are specified by the procuring activity.

2.1.3 Selection of the levels of packaging and packing shall depend on the modes of transport, environmental control, conditions and length of storage, and the anticipated requirements for redistribution.

2.1.4 When Level A or Level B packaging and/or packing is selected, the protective process, materials, and containers shall be in accordance with the requirements of MIL-STD-2073-1. NAS 850 and 851 may be considered for Level B application where the standard meets the requirements for that level.

2.2 Special Design Packaging

2.2.1 For those items possessing characteristics requiring special design packaging as defined in Appendix A, the contractor shall develop the necessary designs, maintain packaging engineering data in sufficient detail to permit necessary review, and implement the packaging specified therein.

2.2.2 Prior to developing a newly designed container, maximum effort shall be made to use container designs or containers from those already available commercially or from Government inventories (see sections 2.9. and 2.10.).

2.2.3 Specifically identified special design packaging may be screened through the Air Force Container Design Retrieval System (hereinafter called the System). Unless otherwise specified, search requests through the System shall be sent directly to Air Armament Center, United States Air Force Material Command, Eglin Air Force Base, FL 32542. (See appendix C for the Container Design Retrieval System Search Request Form.)

2.2.3.1 Each request shall establish a desired response date.

2.2.3.2 Pending timely response, the Transportation Officer shall withhold package container development.

2.2.3.3 When specified by the procuring activity, new design data and engineering drawings with specifications in accordance with MIL-STD-2073-1, shall be submitted as stated in the contract.

2.2.4 Candidates for screening through the System shall be selected on the basis of cost, schedule, and complexity of design and fabrication.

2.3 Package Engineering Documentation

2.3.1 For purposes of this NPR, unless otherwise specified by the procuring activity, package engineering documentation shall be required only for special design packaging. Contractor documentation forms may be used unless otherwise specified in the contract.

2.3.2 Submission and approval shall be in accordance with the Contract Data Requirements List or as otherwise authorized in the contract or by written direction of the contracting officer.

2.3.3 MIL-STD-2073-1 shall be used for guidance.

2.4 Environmental Analysis

2.4.1 The preservation, packaging, packing, and shipping techniques applied shall ensure protection of the contained item against the natural and induced environments to which it may be subjected. Analysis of these hazards is essential prior to item design and development of the packaging and shipping techniques to be applied.

2.4.2 The contractor shall ensure that design engineering provides item fragility, engineering drawings, and sensitivity data to packaging engineering, line packaging, and transportation personnel by completing an NASA Form 1426 (http://server-mpo.arc.nasa.gov/Services/NEFS/NEF_PDFData/NF1426.pdf) or equivalent.

2.4.3 The contractor's packaging and transportation engineers and/or technicians shall participate in equipment design efforts from the earliest stages. They shall:

a. Identify the ground handling, transport and storage environment requirements, including protection from contingency or emergency environments where the environmental analysis indicates that facility/carrier protection is more practical, reliable, or cost effective than providing the same protection by packaging and packing design

b. Prepare or identify testing programs; prepare packaging and transportation data for use in management's configuration documents c. Perform such other functions in the design effort as may be necessary or proper.

2.4.4 The environmental analysis shall include tradeoff considerations of the class of shipping and handling (probability of a loss, cost and schedule impact of loss, and cost of facility and carrier protection) versus cost of packaging and packing protection.

2.4.4.1 The following phases shall be considered:

a. In-plant storage, handling, and local transportation conditions and environments, both normally anticipated and contingency due to such emergencies as natural disasters, fires, spillage, and other accidents.

b. In-transit modes, normal and contingency environments.

c. Receiving, redistribution, handling, and storage conditions at the destination installation, range, test or launch facility including normal and contingency environments.

d. General guidance on transportation environments is available in Military Standardization Handbook 304, Package Cushioning Design. (Also see Military Standard 810 and Military Handbook 1791).

2.5 Packaging and Packing of Hazardous Materials

2.5.1 Department of Transportation (DOT) regulations listed in 49 CFR Subtitle B define Federal requirements applicable to shipments of hazardous materials, such as explosives or radioactive materials, within the United States. Shippers shall contact their export control offices as various international regulations may apply to international shipments.

2.5.2 In general, DOT's hazardous materials regulations are consistent with international regulations issued by the International Civil Aviation Organization (ICAO), ICAO Technical Instructions, which regulate dangerous goods (hazardous materials) shipments via air, and the International Maritime Organization, International Maritime Dangerous Goods (IMDG) Code, which regulates dangerous goods shipments via vessel. Shippers should consult the appropriate model regulations for the shipment.

2.5.2.1 Shippers who offer packages for transportation in compliance with DOT requirements, shall comply with provisions for hazardous materials classification, proper container selection, packing, marking, labeling, placarding, shipping paper preparation, emergency response information, training, and, in some cases, registration and security plan preparation. Additional packaging and packing requirements may be found in the General Provisions and the Safety Provisions of the contract and this NPR.

2.5.2.2 In addition to the requirements of this NPR pertaining to the shipment of hazardous materials, the applicable requirements of NPD 6000.1 and NPR 6200.1 also shall be complied with.

2.5.2.3 Transportation of hazardous materials shall be in compliance with applicable State and municipal rules and regulations.

2.5.2.4 All hazardous materials offered for military airlift shall be prepared in accordance with the requirements of Air Force Logistics Interservice 24-204. Packaging and packing requirements can be found in the General Provisions and the Safety Provisions of the contract and this NPR.

2.5.3 All persons who participate in any of the activities described in section 2.5.2 and 49 CFR 171.1 are defined as "hazmat employees" under 49 CFR Subtitle B and shall successfully complete training described in 49 CFR 172.704 at least every 3 years, and retain documents to provide evidence of that training..

2.5.4 Requirements for U.S. Government material, materials offered for transportation by, for or to the Department of Defense (DoD) or the Department of Energy (DOE), are listed in 49 CFR 173.7.

2.5.5 All items that are subject to ignition or detonation by electrostatic discharge shall be packed in bags manufactured from Military Barrier Material 22191, 121, or 131.

2.5.5.1 Some items may have additional packing requirements. Material used for additional packing to meet further static-generating discharge protection requirements shall conform to Military Barrier Material 81705 before such items are packed in bags made of Military Barrier Material 22191, 121, or 131.

2.5.5.2 Antistatic packaging material shall, in all cases, be intimate to the item.

2.5.5.3 The following notation shall be affixed to each unit package:

WARNING:
CONTENTS SUBJECT TO IGNITION OR DETONATION BY ELECTROSTATIC DISCHARGE. GROUND INNER ANTISTATIC WRAPPING BEFORE AND DURING REMOVAL FROM THIS PACKAGE.

NOTE: THIS WARNING DOES NOT TAKE PRECEDENCE OVER OR SERVE IN LIEU OF

REQUIREMENTS SPECIFIED IN APPLICABLE REGULATIONS AND TARIFFS.

2.5.5.4 Where considerations of precision, cleanliness, flammability, or compatibility with propellants preclude the use of antistatic material meeting Military Barrier Material 81705, Type II, contractors are authorized to use commercially available antistatic materials. Preapproval for such use shall be granted by the Contracting Officer or the Center Transportation Officer.

2.5.6 In addition to the regulations cited in section 2.5.1, further requirements regarding the packaging and transport of radioactive materials are contained in 10 CFR Part 71.

2.6 Degradation by Electrostatic Discharge

2.6.1 Many electronic devices such as thin or thick film resistors, semiconductors, field effect transistors, or circuitry containing any of these can be degraded by static electricity. The contractor shall ensure that design engineering identifies such items and provides the essential precautions to all in-plant handling and packaging personnel.

2.6.2 Items shall be packaged in accordance with section 2.5.5.

2.6.3 Each package shall bear a label warning that the contents can be destroyed by static electricity and shall be handled only by personnel instructed in the necessary precautions.

2.7 Kits (Parts and Modifications)

2.7.1 Preservation, packaging, and packing of kits (parts and modifications) shall be in accordance with MIL-STD-2073-1, Appendix D.

2.8 Weight and Cube

2.8.1 Accomplished packs shall be as simple as possible and of minimum tare weight and cube, consistent with the protection required.

2.8.2 Consolidation containers and pallets shall be properly used to reduce multiple handling

2.8.2.1 Items bearing the NASA Critical Item Label (NASA Form 1368) shall not be commingled with noncritical items in any container.

2.8.3 When the gross weight of the individual pack or consolidation exceeds 100 pounds or when the package cube exceeds 10 cubic feet, use of skids or pallets shall be considered.

2.9 Reusable Containers

2.9.1 Reusable containers are those that are designed to provide adequate protection when reused for return shipments and/or throughout several shipping cycles or sequences. Reusable containers shall be considered for all items that require periodic shipments to and return from repair activities and where adequate provisions to control the containers make reuse economical.

2.9.2 The quantities of reusable containers authorized shall be the minimum essential to meet anticipated needs.

2.9.3 The contractor shall identify reusable containers and provide storage to ensure their

maintenance in a serviceable condition for use. The container specifications issued by the International Air Transport Association merit consideration for application to air shipping cycles. Requirements for reusable containers for U.S. hazardous materials shipments are defined in 49 CFR Part 173.28. Inspection and testing are typical requirements for reusable containers.

2.9.4 Existing reusable containers available commercially or from Government or contractor inventories shall be used to reduce package design and fabrication costs.

2.9.4.1 Modification of existing containers and container designs shall be considered when this is a cost-effective approach.

2.9.5 Multiapplication containers are especially useful for return of repairables since each size and type is suitable for shipment of a large number of different items within certain limits of size, weight, and fragility. These containers are described in MIL-STD-2073-1; Appendix E. Use of this type of container is authorized for Level A, B, and C applications where the multiapplication containers will provide equivalent protection to the contained item.

2.10 Reuse of Packaging Materials

2.10.1 Packaging materials may be considered for reuse to the maximum extent practicable.

2.10.2 The determination for reuse may be based on the quality and condition of the material, the economics of storage and handling of the used material, and the incidence of usage anticipated.

2.11 Disassembly

2.11.1 Disassembly of major components to facilitate packaging or to provide more effective procedures is permissible unless otherwise specified. Components shall remain assembled if previous inspection or test acceptances are invalidated by disassembly.

2.11.2 When necessary secure assembly hardware to one of the mating parts when disassembly is accomplished.

2.12 Matchmarking

2.12.1 When necessary to facilitate reassembly or repackaging, removed parts shall be match marked, unless otherwise required by directions or shipping instructions.

2.12.1.1 Matchmarking information shall be put on cloth shipping tags or on metal tags using waterproofed ink or paint, and attached to mating parts.

2.12.1.2 The marked cloth shipping tags shall be waterproofed with a water resistant spar varnish, a water-resistant paper label adhesive, or any other suitable colorless waterproofing material.

2.12.1.3 At no time shall tags or adhesive create interference with item reassembly.

2.13 Container Markings

2.13.1 Markings on unit packages, intermediate packages, and exterior shipping containers shall be in accordance with the applicable requirements of MIL-STD-2073-1 and this NPR.

2.13.2 Items designated as Class I, Class II, or Class III, in accordance with Appendix A, shall bear

an appropriate NASA Critical Item Label (NASA Form 1368).

2.13.2.1 The label shall be affixed to each side, end, and top of the container.

2.13.2.2 Labels shall not interfere with other required markings.

2.13.2.3 Drums shall be marked with a label on the top and on opposite sides.

2.13.3 Shelf life terminal and preservation expiration dates shall be identified by marking, by tagging, or in log books as specified by design engineering requirements.

2.13.4 Marking and labeling of hazardous materials shall be in accordance with appropriate regulations as cited in section 2.5 and with other contractual provisions.

2.13.5 Marking of hazardous materials needed for compliance with DOT regulations sshall be displayed on a background of sharply contrasting color and not obscured by other container marking or labeling per 49 CFR Part 172.304.

2.14 Testing

2.14.1 Testing of packages, packing methods, and materials shall be in accordance with design engineering requirements.

2.14.1.1 When specific design engineering requirements are not provided, tests shall be performed as specified in Appendix B of MIL-STD-2073-1.

2.14.1.2 In all instances, only standardized packaging testing techniques shall be utilized.

2.14.2 Shipping contractors shall ensure that all special testing data is furnished, as required by the contract.

2.14.3 Preproduction tests shall be performed in accordance with the design requirements of the contract. The necessity for such testing will be determined by considering the following factors:

a. The contractor has data or other evidence to indicate that prior successful tests were conducted and are accepted by the contracting officer as being equivalent to those now being proposed.

b. The packaged item has been subjected to similar tests as a part of other testing programs, as agreed to by procuring activity.

c. The container for a specific item of equipment is developed under an end-item specification, with engineering and testing approval through configuration management procedures and reviews.

d. Detailed packaging instructions are imposed by the procuring activity. 2.14.4 Provisions for the testing of hoisting and material-handling equipment shall be performed as required, per NASA-STD-8719.9.

Chapter 3. Supplier Handling and Transportation Requirements

3.1 Classes of Shipping and Handling

3.1.1 The classes of shipping and handling, defined in Appendix A, shall apply to all equipment, components, and associated parts.

3.2 Packing, Handling, and Transportation Record

3.2.1 A Packaging, Handling, and Transportation Record, NASA Form 1426 (http://server-mpo.arc.nasa.gov/Services/NEFS/NEF_PDFData/NF1426.pdf), or equivalent information shall be developed from engineering data for each Class I item.

3.2.2 Each Center Transportation Officer shall establish procedures to ensure that changes in packaging data, handling, and transportation methods are reflected in amended or revised records in a timely manner.

3.2.3 Information, when reproduced, shall not be altered in size or content.

3.3 Approval of Packaging, Handling and Transportation Records

3.3.1 The NASA Form 1426 (http://server-mpo.arc.nasa.gov/Services/NEFS/NEF_PDFData/NF1426.pdf) (or an equivalent form), shall be submitted and approved by the Center Transportation Officer or delegated to the quality representative of the procuring location, as well as by a designated representative of the procuring activity.

3.3.1.1 Shipment shall not proceed without this approval.

3.3.1.2 Procedures for interim approval in emergency cases shall be as established by the procuring activity.

3.4 NASA Critical Space Item Label

3.4.1 Shipping contractors shall ensure that the NASA Critical Space Item label, NASA Form 1368, is prominently displayed on the exterior of all Class I, Class II, and Class III interior packages and exterior shipping containers to alert handling personnel to the criticality of the item. Its use is intended to ensure special handling by carrier, receiving, and storage personnel in accordance with NPR 6200.1. The label is obtainable from procuring activities in the three different sizes.

3.4.2 Labels only shall be affixed to the exterior container for items not on the Transport Critical Item List but requiring special transportation consideration due to schedule or program constraints.

3.5 Monitoring Devices for Shipments

3.5.1 When use of a monitoring device is indicated or has been recommended and its use authorized by shipper, such devices shall be of a type and nature that will detect and provide a permanent notation that the packaged contents have been subjected to adverse conditions, such as temperature, shock, or moisture that could impair their ability to perform their principal function in a satisfactory manner.

3.5.1.1 Monitoring devices shall be installed and used in accordance with standard application of the item and in a manner that will permit their observation and inspection with a minimum of assembly or disassembly.

3.5.1.2 The location of devices, including shock-measuring instruments, shall be marked prominently on the exterior container.

3.5.2 Shock measuring instruments shall be used in accordance with applicable standards.

3.6 Transportation Planning

3.6.1 Modes of shipment shall be in accordance with transportation and logistics support plans, implemented in accordance with contractual requirements.

3.6.2 When such direction is not provided in the contract, the mode that shall be employed is one that provides the most reliable protection to the items involved and takes into account the time, schedule, and cost.

3.6.3 The contractor shall establish and implement procedures for the control of premium transportation costs to be incurred, such as special mission airlift, chartered aircraft, exclusive use of carrier equipment, and unusual and excessive accessorial charges.

3.6.4 Upon request, transportation data for items requiring special design transportation and handling equipment, special commercial carrier or Government services, shall be submitted in accordance with the contract. The contractor's format may be used unless otherwise specified.

3.6.4.1 Approval shall be as specified or as otherwise authorized in the contract or by written direction of the contracting officer.

3.6.4.2 Approval shall be obtained prior to shipment from Transportation Officer or designated representative.

3.6.5 All shipments made to out of Continental United States locations shall comply with NPR 2190.1, NASA Export Control Program.

3.7 Restraining Systems

3.7.1 During highway, air, rail, and marine shipments, items in their shipping configuration and skidded and wheeled equipment shall be provided with tie-down and lifting provisions commensurate with their size and weight. Additional safety measures may be required and shall be considered during the design of the restraining system due to peculiarities of the cargo, carrier safety considerations, or accident effects, especially where hazardous materials are involved.

3.8 Monitoring of Transportation and Handling Process

3.8.1 Contractors are responsible for monitoring each class of shipment and shall ensure necessary

coordination with the transportation officer of the procuring activity, with carrier representatives, and with transportation officials at the destination to ensure that the following have taken place:

a. An inspection has been performed prior to shipment to include verification of compliance with the Packaging, Handling, and Transportation Record or equivalent information.

b. NASA Critical Space Item labels have been affixed to the shipping containers for Class I, II and III items.

c. Shipment routing requests include special handling and monitoring instructions and provide necessary notification to en route transfer agents.

d. Advance shipping and handling information is provided to requisite en route parties.

e. Arrangements are made for escort or courier services as may be necessary.

f. Transportation, preservation, packaging, handling, and logistics plans included in contract are accomplished.

g. Class IV items are shipped via the most advantageous commercial transportation means considered to be in the best interest of the Government.

3.8.2 Shippers shall provide Packaging, Handling, and Transportation Records or equivalent information for mission-essential items to destination transportation officers to ensure proper receiving, damage-free handling and storage, and essential protection through redistribution and final use.

3.8.3 Receiving organizations shall provide originating transportation officers with timely advice concerning losses in transit or handling due to inadequate packaging protection or failure to follow established transportation and handling procedures.

3.8.4 Prior to shipping radioactive materials regulated by the Nuclear Regulatory Commission or any State agency, those making shipments shall ensure that the designated receiving facility is authorized to receive the type, form, and quantity of radioactive material to be transferred.

3.8.5 The contractor shall maintain carrier performance data when service issues are encountered with carriers.

3.8.5.1 Data shall include any corrective actions taken by the carrier in responding to service failures.

3.8.5.2 The contractor shall submit carrier performance data to the Center Transportation Officer annually, by October 31 of each calendar year.

Appendix A: Definitions

Classes of Shipping and Handling. Designation of the criticality and complexity of shipping a particular item based on the following:

Class I. Mission-essential items that, in the event of loss, damage, or delay in shipment, would adversely affect the program or project.

Class II. Delicate or sensitive items not covered by Class I or Class III. These items are those that may be damaged readily by improper handling.

Class III. Items requiring special handling and monitoring.

Class IV. Those items that may be transported or handled through the use of normal commercial transportation means.

Contract Date Requirements List. A listing of the technical information and reports required for a contract including submittal and approval criteria and instruction.

Contractor. The Center transportation support services contractor or a program or project contractor responsible for shipping on behalf of NASA.

Hazmat Employees. All persons who participate in shipping hazardous materials, such as explosives or radioactive materials.

Levels of Protection for Preservation, Packaging, and Packing. Designation of the protection level required for shipping a particular item based on the following:

Level A. Maximum protection level required for protection of material against the most severe worldwide shipment, handling, and storage conditions.

Level B. Intermediate protection level required for protection of material under anticipated favorable conditions during worldwide shipment, handling, and storage conditions.

Level C. Minimum protection level required for protection of material under known favorable conditions.

Mission Essential Item. An item of equipment or a part for which the lack of immediate issue on call at the demand source would adversely affect a program or project schedule, safety, or reliability.

NASA Critical Space Item Label. A standardized, distinctive label that is prominently displayed on all interior and exterior shipping containers for items on the Transport Critical Item List. The label alerts shipping and handling personnel to the criticality of the item.

Packaging. The application and use of adequate protective measures to prevent damage during transportation and storage, including application of package wraps, cushioning, and complete identification markings.

Packaging, Handling and Transportation Record, NASA Form 1426. The official record defining the specific levels and means of preservation, packaging, packing, marking, handling, and shipping instructions for mission-essential items.

Packing. The final placement of items or packages in exterior shipping containers or other media, including necessary blocking, bracing, cushioning, weatherproofing, exterior strapping, and marking.

Preservation. The application and use of adequate protective measures to prevent deterioration from environmental hazards. Measures include appropriate cleaning and drying methods, preservatives, and wrapping for protection from chemical danger.

Special Design Packaging. Packaging that is used for items possessing characteristics requiring specially designed cushioning, blocking and bracing, or specially designed containers to provide necessary protection. The approval of a packaging engineer or specialist is required. Special design packaging applies to items that present any of the following:

a. Special handling, packaging, or transportation problems because of restrictive shock or vibration characteristics.

b. A requirement for special environmental control.

c. A requirement for special or critical pressure or temperature limits.

d. A requirement for specialized container design, handling devices, fixtures, or monitoring devices.

e. A requirement to meet special conditions and limitations of storage.

f. Special kitting requirements containing hazardous materials.

g. Kitting processes containing special design packaging.

Transport Critical Item List. A list of items prepared by the contractor and approved by a Center Transportation Officer. The list includes items that are deemed mission essential or that require special handling, monitoring, or an escort.

Transportation Official. The official(s) assigned the central responsibility for implementing traffic management functions.

Unit Package. The first tie wrap or container applied to a single item or several items of the same identifying number or nomenclature, or a group of items included under one identifying number or nomenclature that comprise a complete or identifiable package.

Appendix B: Acronyms

DoD	Department of Defense
DOE	Department of Energy
DOT	Department of Transportation
FAR	Federal Acquisition Regulation
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods
NAS	National Aerospace Standards
NPD	NASA Policy Directive
NPR	NASA Procedural Requirement

Appendix C: Container Design Retrieval System Request Form

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