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# MILITARY STANDARD

# PACKAGING, HANDLING, STORAGE, AND TRANSPORTABILITY PROGRAM REQUIREMENTS (FOR SYSTEMS AND EQUIPMENTS)

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DEPARTMENT OF DEFENSE

Washington, D. C. 20301

Packaging, Handling, Storage, and Transportability Program Requirements
( For Systems and Equipment)

MIL-STD-1367

1. This standard is mandatory for use by all departments and agencies of the Department of Defense.

2. This standard covers an authorized management system; its number on the acquisition management systems list is 21534.

3. Recommended corrections, additions, or deletions should be addressed to: Standardization Division, Naval Ordnance Station, Indian Head, Md. 20640.

# FOREWORD

The purpose of this standard is to establish uniform packaging, handling, storage, and transportability program management procedures for Department of Defense procurements.

Packaging, handling, storage, and transportability (called PHST throughout this standard) is one of many subsystems which must be considered in a system engineering effort. In its simplest essence, PHST management provides a manager with the capability of having a useful system, assuring him that its elements can be delivered to the user. Efficient PHST has significant impact on system effectiveness, reliability, maintainability, and safety. PHST consumes a measurable percentage of overall cost and is, therefore, a significant element of life cycle investment. Thus, PHST is a key ingredient in integrated logistic support.

Optimizing the PHST system is one essential in optimizing the parent system. The degree to which PHST suboptimizing contributes to optimizing the system is directly dependent upon the management emphasis received during all phases of the life cycle.

CONTENTS


| Paragraph | | Page |
|---|---|---|
| 1. | SCOPE | 1 |
| 2. | REFERENCED DOCUMENTS | 1 |
| 3. | DEFINITIONS | 4 |
| 4. | GENERAL REQUIREMENTS | 7 |
| 4.1 | PHST program requirement | 7 |
| 4.1.1 | Lower tier contractors | 7 |
| 4.2 | Program interfaces | 7 |
| 4.2.1 | Systems engineering management and integrated logistic support | 7 |
| 4.2.2 | Work breakdown structure | 7 |
| 4.2.3 | Configuration management | 7 |
| 4.2.4 | Reliability | 7 |
| 4.2.5 | Maintainability | 8 |
| 4.2.6 | Value engineering | 8 |
| 4.2.7 | Quality | 8 |
| 4.2.8 | Standardization | 8 |
| 4.2.9 | Safety | 8 |
| 4.2.10 | Human engineering | 8 |
| 4.2.11 | Shelf life controls | 8 |
| 4.2.12 | Product cleanliness levels and contamination program | 8 |
| 4.3 | Technical implementation | 8 |
| 4.3.1 | Transportation and delivery mode dimensional constraints | 8 |
| 4.3.2 | Deliverable product compatibility | 9 |
| 4.3.3 | Handling equipment design criteria | 9 |
| 4.3.4 | Packaging design criteria | 9 |
| 5. | DETAILED REQUIREMENTS | 9 |
| 5.1 | PHST program requirements | 9 |
| 5.1.1 | Program control | 9 |
| 5.1.2 | Distribution and delivery concepts | 9 |
| 5.1.2.1 | Data | 10 |
| 5.1.3 | Special storage and stowage requirements | 10 |
| 5.1.3.1 | Units stowed in combatants and direct support auxiliaries | 10 |
| 5.1.3.2 | Data | 10 |
| 5.1.4 | Additional elements of the PHST program | 11 |
| 5.1.4.1 | Reusable containers | 11 |
| 5.1.4.2 | Support analysis | 11 |

| | | Page |
|---|---|---|
| 5.2 | PHST performance baseline | 11 |
| 5.3 | PHST allocated baseline | 11 |
| 5.3.1 | PHST program | 11 |
| 5.3.2 | Screening existing equipment | 12 |
| 5.3.3 | Determining specific PHST design requirements | 12 |
| 5.3.3.1 | Trade-off studies | 12 |
| 5.3.4 | PHST development specifications | 14 |
| 5.3.4.1 | Exception | 14 |
| 5.3.5 | Deliverable product specifications | 14 |
| 5.3.6 | Inventory item specifications | 14 |
| 5.4 | PHST product baseline | 14 |
| 5.4.1 | Additional PHST requirements and analysis | 14 |
| 5.4.2 | Program execution | 15 |
| 5.4.2.1 | Basic concepts | 15 |
| 5.4.3 | PHST equipment data package | 16 |
| 5.4.4 | Product specification conversion | 16 |
| 5.4.4.1 | Shipping condition drawing | 16 |
| 5.4.4.2 | Detailed description in specification | 16 |
| 5.4.4.3 | Written description in specification | 16 |
| 5.4.5 | Unit loads | 16 |
| 5.4.6 | Vehicle loading configurations | 17 |
| 5.4.6.1 | System/equipment integrity | 17 |
| 5.4.6.2 | Equipment clearance diagram | 17 |
| 5.4.7 | Nomenclature | 17 |
| 5.4.8 | Proof of design testing | 17 |
| 5.4.9 | Equipment releases | 17 |
| 5.4.10 | Integrated logistic support of PHST equipment | 18 |
| 5.4.11 | Special processes | 18 |
| 5.4.12 | Material safety data | 18 |
| 5.5 | Production phase | 19 |
| 5.5.1 | PHST program execution | 19 |
| 5.5.2 | Additional PHST engineering | 19 |
| 5.5.2.1 | Federal stock numbering | 19 |
| 5.5.3 | PHST monitoring | 19 |
| 6. | NOTES | 19 |
| 6.1 | Intended use | 19 |
| 6.1.1 | Management list | 19 |
| 6.1.2 | Engineering for transportability | 19 |
| 6.1.3 | MIL-STD-648 | 19 |
| 6.2 | Tailoring | 19 |

Page

6.2.1 How to tailor . . . . . 21
6.2.2 Time phase tailoring . . . . . 22
6.3 Data . . . . . 22
6.3.1 Supporting data item descriptions . . . . . 22

FIGURES

1. An Example of Activities Requiring Distribution and Delivery Analysis . . . . . 13
2. An Example of a Tailored PHST Management Requirement . . . . . 21

TABLES

I. Guidance to Application of this Standard . . . . . 20
II. Paragraphs Which Generate Potential Data Requirements . . . . . 23

MILITARY STANDARD

# PACKAGING, HANDLING, STORAGE, AND TRANSPORTABILITY PROGRAM REQUIREMENTS (FOR SYSTEMS AND EQUIPMENTS)

## 1. SCOPE

1.1 Purpose. This standard establishes uniform management requirements for a packaging, handling, storage, and transportability (PHST) program. The use of the term transportability program herein refers to those aspects of transportability relative to packaging, handling, and storage and in no way obviates the Department of Defense engineering for transportability program (see 6.1.2).

1.2 Application. This standard will be the basis for preparing specifications, work statements, or other documents affecting PHST. The applicable DD Form 1660 displays the applicability of this standard to specific contracts or projects, as also amplified by specific applicable contract or project work statements (see 6.1 and 6.2).

## 2. REFERENCED DOCUMENTS

2.1 The issues of the following documents in effect on the date of invitation for bids form a part of this standard to the extent specified herein.

SPECIFICATIONS

Military

| | |
|---|---|
| MIL-Q-9858 | Quality Program Requirements |
| MIL-V-38352 | Value Engineering Program |
| MIL-H-46855 | Human Engineering Requirements for Military Systems, Equipment and Facilities |
| MIL-S-83490 | Specifications, Types and Forms |
| MIL-P-84000 | Provisioning Screening Data to be Furnished by Government Suppliers |

STANDARDS

Federal

| | |
|---|---|
| FED-STD-313 | Symbols for Packages and Containers for Hazardous Industrial Chemicals and Materials |

Military

| | |
|---|---|
| MIL-STD-137 | Material Handling Equipment |
| MIL-STD-147 | Palletized and Containerized Unit Loads, 40 Inch by 48 Inch Pallets, Skids, Runners or Pallet Type Base |
| MIL-STD-470 | Maintainability Program Requirements |
| MIL-STD-480 | Configuration Control, Engineering Changes, Deviations and Waivers |
| MIL-STD-483 | Configuration Management Practices for Systems, Equipment, Munitions, and Computer Programs |
| MIL-STD-490 | Specification Practices |
| MIL-STD-499 | System Engineering Management |
| MIL-STD-648 | General Design Criteria for Systems Shipping Containers |
| MIL-STD-680 | Contractor Standardization Plans and Management |
| MIL-STD-785 | Requirements for Reliability Program (for Systems and Equipment) |

| | |
|---|---|
| MIL-STD-794 | Parts and Equipment, Procedures for Packaging and Packing of |
| MIL-STD-881 | Work Breakdown Structure for Defense Materiel Items |
| MIL-STD-882 | System Safety Program for Systems and Associated Sub-Systems and Equipment, Requirements for |
| MIL-STD-1246 | Product Cleanliness Levels and Contamination Program |
| MIL-STD-1319 | Preparation of Performance and Compatibility Requirements (P&CR) for Packaging, Handling, Storage and Transportation |
| MIL-STD-1365 | General Design Criteria for Handling Equipment Associated With Weapons and Weapon Systems |
| MIL-STD-1366 | Packaging, Handling, Storage, and Transportation System Dimensional Constraints, Definition of |

PUBLICATIONS

BULLETINS

Air Force - Navy

| | |
|---|---|
| ANA 438 | Age Controls of Age-Sensitive Elastomeric Items |

FORMS

| | |
|---|---|
| DD 1423 | Contract Data Requirements List |

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity or as directed by the contracting officer.)

2.2 Other publications. The following documents form a part of this standard to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids shall apply.

MANUALS

Department of Defense

| | |
|---|---|
| 4120.3M | Standardization Policies, Procedures and Instructions |

4145.26M DOD Contractor's Safety Manual for Ammunition, Explosives and Related Dangerous Material

(Application for copies should be addressed to the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402.)

3. DEFINITIONS

3.1 General. The definitions given herein cover terms as they are used in this standard and are not to be confused with any definitions appearing elsewhere.

3.2 Base lines. The definitions of the various configuration identification and management base lines shall be as stated in MIL-STD-480.

3.3 Maintenance levels. Definitions of the respective maintenance levels follow:

3.3.1 Organizational maintenance. Organizational maintenance is that maintenance which is the responsibility of and which is performed by a using organization on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies.

3.3.2 Intermediate maintenance. Intermediate maintenance is that maintenance which is the responsibility of and which is performed by designated maintenance activities for direct support of using organizations. It normally consists of calibration, repair or replacement of damaged or unserviceable parts, and providing technical assistance to using organizations. Intermediate maintenance is normally accomplished in fixed or mobile shops, tenders, or shore-based repair facilities.

3.3.3 Depot maintenance. Depot maintenance is that maintenance which is the responsibility of and which is performed by designated maintenance activities to augment stocks of serviceable material and to support organizational and intermediate maintenance activities by using more extensive shop facilities, equipment, and personnel of higher technical skill than are available at the lower levels of maintenance. It normally consists of repair, modification, alteration, modernization, overhaul, reclamation, or rebuild of parts, assemblies, subassemblies, components, and end items; emergency manufacture of nonavailable parts; and providing technical assistance to using activities and intermediate maintenance organizations. Depot maintenance is normally accomplished in fixed shops, shipyards, and comparable shore-based facilities.

3.4 Handling. Moving items from one place to another within a limited range.

3.4.1 Handling equipment. A device or devices designed and used to make handling possible, easier, or more efficient.

3.5 Packaging. Includes all the operations and devices required to prepare items for distribution, such as preservation-packaging, packing, marking for shipment, unit load, unitizing, and palletizing; it does not, however, include car, truck, aircraft, or ship loading.

3.6 Shipment. Transfer for an appreciable distance (several miles or more) using equipment commonly available to or usable by common carriers such as rail cars, ships, aircraft, barges, or trucks.

3.7 Vehicle loading configuration. An assemblage of deliverable product plus (where used) its container or shipping skid, in a unit load (if applicable), in or on its shipping equipment plus all restraining devices such as tie downs, special shock and vibration absorbing mechanisms, particular dunnaging devices or techniques, blocking and bracing, and hold backs.

3.8 Transportability. The inherent capability of material to be moved by towing, by self-propulsion, or by carrier via railways, highways, waterways, pipelines, oceans, and airways.

3.8.1 Transportability problem item. An item in its shipping configuration which exceeds one or more of the dimensions 32 feet in length, 8.0 feet in width; 8 feet in height, or 11,200 pounds in weight; any material defined as hazardous in the Department of Transportation regulations; any item so sensitive to shock, vibration, or climatic environment that specialized containers are essential to its movement; any item requiring special security procedures or technical escort while in transit; or any item requiring special handling procedures or unusual material handling equipment while in transit.

3.9 Reusable container. A device which may be used, after at least one shipment and opening, to reship an item or a collection of items with the same item description but not necessarily the exact same item or items initially shipped. Container reusability is divided into several subcategories as follows:

3.9.1 Fully reusable. The design features are such that, allowing for attrition and providing appropriate intermediate maintenance, the container's

expected service life will equal the service life of the system of which its contents form a part. A fully reusable container has its own specific official nomenclature and is considered a separate item of supply with an appropriate Federal Stock Number. Typical examples are shock mounted metal containers for guided missiles and their components or for high value replacement assemblies such as engines and transmissions.

3.9.2 Multiple trip loaded. The design features are such that, subject to simple replacement of readily available components, the container can be employed for more than one round trip from initial supply source to the content consumer and return. A typical example is a demountable wooden crate fabricated from treated or painted lumber equipped with closures or fastenings permitting ready assembly, disassembly, and reassembly.

3.9.3 Single round trip loaded. The design features are such that the container is intended to be capable of returning a like repairable item to the designated maintenance activity without significant increase in damage to its contents. Upon completion of this return trip the container is considered nonrecoverable. A typical example is a tape-sealed, wet-strength, corrugated fiberboard container with lightweight wraparound cushioning material enclosed therein.

NOTE: Differentiation between multiple trip loaded containers and single round trip loaded containers is largely a matter of the designer's intent as expressed in the structural durability and environmental resistance built into the design; hence, differentiation is often subjective.

3.9.4 Returnable empty. The design permits return of the empty container to initial packing activity for reloading and reshipment. Examples: a shipping container for inert ammunition items shipped to an explosives loading activity for subsequent processing; interplant shipping containers in general.

3.9.5 Simple reclosable. The design permits one or more openings of the container to permit inspection of or further work on the contents. Examples: a container for an inert ammunition item which is also used to ship the explosive loaded ammunition item; a container for an item with a restricted shelf-life provided with features which permit one or more openings for inspection of content condition.

NOTE: All reusable containers are reclosable. The category simple reclosable is reserved for containers which are not intended to be returned but may need to be opened one or more times prior to unpacking by the user of the contents.

3.10 Nonreusable container. A container not intended for reuse after the first unpacking; or legally debarred from such reuse such as those marked "NRC" which have been loaded with an explosive or other dangerous article.

4. GENERAL REQUIREMENTS

4.1 PHST program requirement. A PHST program shall be established and maintained. The program shall be planned for visibility, developed, and integrated with the system/equipment design and support engineering program to assure effective and timely accomplishment. The PHST program shall contribute to the acquisition of an operationally effective and supportable/equipment designed for the lowest life cycle cost. The PHST program shall be consistent with the type and complexity of system/equipment and the system/equipment life cycle phase being procured (see 6.2).

4.1.1 Lower tier contractors. The contractor's program shall assure applicability to lower tier contractors (subcontractors and vendors) delivering portions or all of the system/equipment directly to the Government or for which such lower tier contractors have design responsibility.

4.2 Program interfaces. The PHST program shall establish and maintain clear interfacial relationships with the following other program efforts to the extent that each of these programs is imposed by the contract. Reference to any document in this paragraph or its subparagraphs does not automatically make such document a part of the contract.

4.2.1 Systems engineering management and integrated logistic support. The PHST development program required herein shall be conducted as an integrated part of, and in appropriate phasing with, the overall systems engineering management program (for example, MIL-STD-499), and the integrated logistics support program.

4.2.2 Work breakdown structure. The contractor shall relate the PHST program to the elements of his work breakdown structure; for example, MIL-STD-881.

4.2.3 Configuration management. The PHST program shall be coordinated with, and be a part of, the contractually imposed configuration management program; for example, MIL-STD-483.

4.2.4 Reliability. The PHST program shall be coordinated with the reliability program; for example, MIL-STD-785.

4.2.5 Maintainability. The PHST program shall be coordinated with the maintainability program; for example, MIL-STD-470.

4.2.6 Value engineering. The costs of PHST equipment and procedures shall be continuously evaluated during development, production, and contractor support phases to optimize the cost/benefit ratio. Evaluations shall be conducted in accordance with the standards set by the value engineering program; for example, MIL-V-38352.

4.2.7 Quality. The PHST program shall be coordinated with the quality program; for example, MIL-Q-9858.

4.2.8 Standardization. Consistent with logistic and performance requirements, standard PHST procedures, equipment, or parts already in the Government inventory shall be used. The PHST standardization effort shall be consistent with the standardization program requirements of the contract; for example, MIL-STD-680.

4.2.9 Safety. The PHST development program shall be consistent with the system safety program; for example, MIL-STD-882, and, in the case of ammunition or explosives, with Department of Defense manual 4145.26M.

4.2.10 Human engineering. The PHST development program shall be consistent with the human engineering program; for example, MIL-H-46855.

4.2.11 Shelf life controls. The PHST program shall be consistent with shelf life of packaged end item under projected storage conditions. As an example, the PHST program shall show compatibility with the requirements of ANA Bulletin No. 438 for elastomeric items.

4.2.12 Product cleanliness levels and contamination program. The PHST program shall assure compatibility with the procedures required for inspection, rework, and handling of precision cleaned items required to maintain product cleanliness pursuant to the standards imposed; for example, MIL-STD-1246.

4.3 Technical implementation. Handling equipment, preservation methods, and container designs shall satisfy the following technical criteria.

4.3.1 Transportation and delivery mode dimensional constraints. The PHST development program shall be constrained by the transportation and delivery mode dimensional constraints contained in MIL-STD-1366.

4.3.2 Deliverable product compatibility. The PHST development program shall insure compatibility with the deliverable product. The range of information which may be required to define such compatibility is contained in MIL-STD-1319.

4.3.3 Handling equipment design criteria. Specific design criteria for handling equipment developed hereunder shall be selected from the pertinent requirements of MIL-STD-1365.

4.3.4 Packaging design criteria. Technical guidance in selecting preservation and packaging and packing procedures shall be taken from MIL-STD-794. Special design containers shall meet selected design criteria from MIL-STD-648 (see 6. 1. 3).

5. DETAILED REQUIREMENTS

5.1 PHST program requirements. A PHST program shall be developed and implemented as a part of the system engineering process. The program shall be an iterative process consistent with the life cycle stage of the system/equipment.

5.1.1 Program control. The PHST program shall assure:

(a) Scheduling to permit contractor and procuring activity program review of status at checkpoints consistent with end item development, test, production, and delivery schedules.

(b) Appropriate reporting on and monitoring of progress as required by the applicable data item description.

(c) Feedback mechanisms to assure that the results of end item or PHST equipment testing, service experience, and configuration changes are incorporated in PHST development.

(d) Scheduling and conducting PHST program/technical reviews as a part of systems engineering management/design reviews, as required by the contract statement of work.

5.1.2 Distribution and delivery concepts. The system/equipment distribution and delivery concepts identified in the systems specification, the contract statement of work, or determined through application of the contractual systems engineering requirement shall be used as constraints and requirements in PHST program and related technical activities.

5.1.2.1 Data. When required by the contract statement of work, the contractor shall perform, prepare, and deliver a system/equipment distribution and delivery analysis in accordance with the applicable contract DD Form 1423.

5.1.3 Special storage and stowage requirements. Special storage and stowage requirements for elements of the system shall be carefully identified and, where appropriate, shall be the subject of trade-off studies (see 5.3.3.1). Among the special storage and stowage requirements needing early identification and analysis are:

(a) Need for air conditioned spaces

(b) Need for special temperature controls; for example, mechanical refrigeration of the storage/stowage space versus providing the control within a container; or the need for and methods of retaining cryogenic temperatures

(c) Need for maintaining unit under various forms of continuous operation; for example, power to inertial reference systems; or maintaining special units, such as ion pumps, capable of retaining specified vacuum or pressure levels

(d) Need for segregated storage/stowage facilities dictated by the nature of the contents, including the need for special security measures; for example, magazine storage/stowage needed because item is ammunition or explosive; flammable area stowage required; or armed guards required (see also 5.4.12)

(e) Any other factors requiring more than straightforward receipt, storage, simple cyclic inspection of any humidity indicators used, and issue of a standard commodity.

5.1.3.1 Units stowed in combatants and direct support auxiliaries. Units to be stowed in combatant units or direct support auxiliaries shall receive special attention not only with respect to the foregoing factors but also with respect to space required as well as clearances and routings needed to move from stowage space to point of consumption. While this requirement has particular emphasis to items stowed aboard ships, it applies just as well to stowage of a replacement fuse in a truck.

5.1.3.2 Data. When required by the contract statement of work, the contractor shall prepare and deliver a report of special storage and stowage requirements in accordance with the applicable DD Form 1423.

5.1.4 Additional elements of the PHST program. The PHST program shall include appropriate attention to the following additional areas of inquiry which have significant effect on viability of the PHST program.

5.1.4.1 Reusable containers. The program shall identify the need for reusable containers and the degree of reusability required, supported by trade-off studies (see 5.3.3.1) as appropriate.

5.1.4.2 Support analysis. The results of logistic support analysis (maintenance engineering analysis and optimum repair level analysis) shall be used in the PHST program to identify basic packaging design criteria for repair parts. Among these basic criteria are:

(a) Quantity per unit package

(b) Degree of reusability of the container, related to the part's maintenance concept

(c) Storage or stowage space and handling procedure constraints, applicable to package design

(d) Special fragility and other handling constraints

(e) General type of packaging required.

Where special container designs and special handling equipment are required, the design constraints shall be identified. The program shall provide for appropriate iteration of selected portions of the initial analysis conducted on prime and critical items, as defined in MIL-STD-490, over the spare and repair parts needed to support the system, giving primary emphasis to items needed for organizational and intermediate maintenance and to high value items.

5.2 PHST performance baseline. Packaging, handling, and storage equipment in support of the system and its components for logistical and tactical movement as defined in the system requirements (material need, required operational capability, operational requirement) shall be considered and plans of attack on potential transportability problem items shall be formulated.

5.3 PHST allocated baseline.

5.3.1 PHST program. The PHST program shall be expanded to cover the following areas:

(a) Specific logistic operations and identification of each item of PHST equipment required to support system prime and critical items throughout the life cycles shall be formulated. Every transfer and handling activity throughout the logistic cycle shall be identified. An example of the transfer operations and activities requiring consideration is contained in figure 1. When required by the applicable DD Form 1423, the results of the analysis required herein shall be reduced to charts or other data and shall be submitted.

(b) The logistic flow analysis shall be used as the basis for determining what new items of PHST equipment require development.

5.3.2 Screening existing equipment. A survey of existing PHST equipment (for example, MIL-STD-137) shall be undertaken to determine what existing designs might be used as is or after adaptation to the specific problem at hand.

5.3.3 Determining specific PHST design requirements. The specific PHST design requirements and associated proof of design tests and evaluations applicable to the PHST equipment for each prime and critical item shall be determined. In selecting requirements, the basic logic of MIL-STD-794 shall be followed for selecting methods of packaging. Container design shall be aimed at satisfying the applicable design criteria selected from MIL-STD-648, using those containers listed in MIL-STD-794 as applicable. Handling equipment shall be designed in accordance with MIL-STD-1365.

5.3.3.1 Trade-off studies. In selecting pertinent PHST design concepts, the following trade-off studies shall be made, as a minimum:

(a) Cost of ownership. Studies of cost of ownership shall include cost of transportation, PHST equipment, and costs of inventory in motion.

(b) Large items which might be capable of shipment uncrated. These studies must show relative costs of the alternate methods, relative times involved, alternative methods of protection, tentative methods for securing to the transit vehicle, ability of receiving activities to handle, store, and reassemble the item, which delicate parts or subassemblies will be removed, and how they will be packaged and shipped to insure necessary concurrency at the reassembly point. The trade-off studies should indicate when uncrated shipments are to be used during engineering phase system testing and demonstration (for example, special padded, air ride vans for system components). Items so identified will require further PHST development.

(c) Items requiring development or use of special transport equipment (see MIL-STD-1319). These studies must show advantages of special conveyances as compared to standard conveyances and shall also show rationale for

selecting use of specialized equipment, rationale behind requiring technical escort to maintain climatic control, unit reliability safety or security, and the skill levels required.

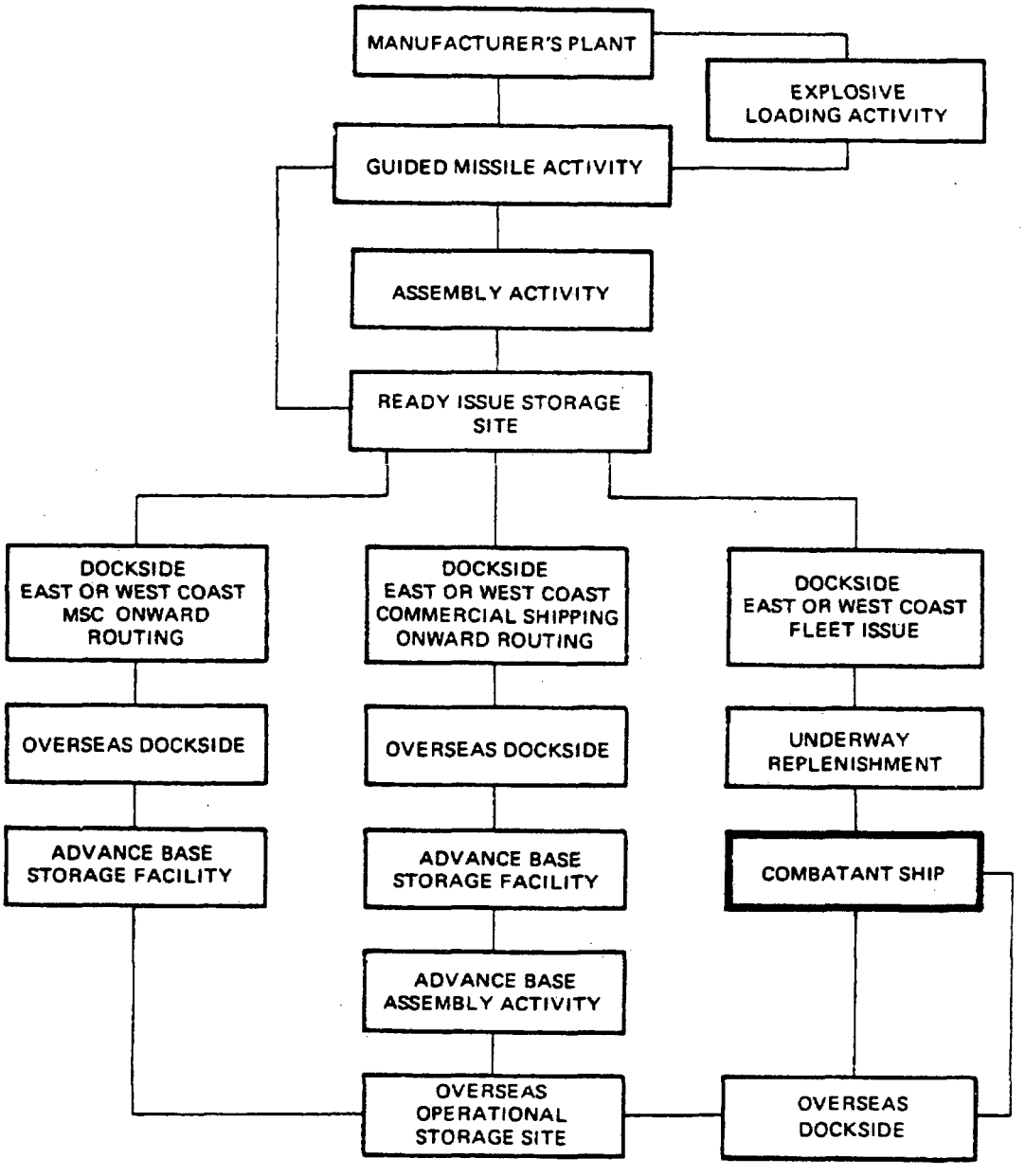


Figure 1. An Example of Activities Requiring Distribution and Delivery Analysis (This Example is Keyed to a Navy Guided Missile; Other Systems Will Differ.)

5.3.4 PHST development specifications. Engineering critical item development specifications (type B1, 2, 3 form 1, 2, 3 as referenced in MIL-S-83490) shall be prepared for the following PHST items requiring development:

(a) All containers for transportability problem items

(b) All reusable containers for prime or critical deliverable product

(c) All containers requiring engineering design of cushioning or other shock and vibration isolation systems

(d) All containers requiring special temperature control systems or dynamic dehumidification during shipment and storage

(e) All handling equipment for prime, critical, and transportability items where the handling equipment will be used by any Government activity; that is, not exclusively for the contractor's own inplant handling procedures.

5.3.4.1 Exception. Where the proposed design is relatively simple, pertinent explicit PHST design and test requirements may be included in section 5 of the deliverable item development specification.

5.3.5 Deliverable product specifications. Section 5 of deliverable product specifications shall cross-reference the PHST development specifications or shall be explicit within themselves (see 5.3.4.1). Long, meaningless references to a compendium of specifications shall be avoided. Deliverable product specifications shall reflect the levels of protection dictated by logistical necessity, but only the maximum level required, which does not necessarily have to be level A, shall be configured.

5.3.6 Inventory item specifications. Inventory item specifications (type C4, form 1a, as defined in MIL-S-83490) shall be prepared for Government inventory items which interface directly with prime and critical items. Inventory item specifications shall not be prepared for standard PHST items such as forklift trucks and pallet trucks.

5.4 PHST product baseline.

5.4.1 Additional PHST requirements and analysis. Analysis of PHST requirements for repair parts, consumable supplies, and training equipments shall be an output of required maintenance engineering (optimum repair level analysis)

and training analysis. Equipments, parts, and consumables identified as being required for system support and the storage and transportation needed to meet operational requirements shall be analyzed to develop the following factors:

(a) Dimensions of parts and supplies required to support the system

(b) Storage time limitations to items based on optimum packaging to insure minimum depreciation due to storage environmental conditions

(c) Setup and production time on reorders

(d) Transportation times; for example, factory to depot and depot to intermediate storage

(e) Degree of container reusability required.

These data shall be related to the procuring service's inventory management policies, such as reorder intervals and minimum value of the order. Based upon these inputs, the contractor shall prepare appropriate PHST requirements to be used as a part of the provisioning process.

5.4.2 Program execution. The approved PHST development program shall be executed in accordance with the technical criteria and time phasing contained therein. The order of work events stated hereinafter shall not be construed as being germane to the relative time phasing necessary nor to their relative importance.

5.4.2.1 Basic concepts. PHST development shall be so managed, engineered, and tested as to assure that, in addition to overall program goals, (see 4.1):

(a) The PHST equipment is available in timely fashion.

(b) The PHST equipment is maintainable by service activities no later than the beginning of deployment, regardless of the date the using service is scheduled to assume system support responsibility.

(c) PHST equipment developed hereunder unless otherwise authorized:

(1) Is capable of breakout for separate procurement as identical items and does not require sole source manufacture

(2) Requires minimum organizational maintenance

(3) Is capable of maintenance at the intermediate level

(4) Does not require depot level maintenance. A requirement for depot level maintenance shall be supported by appropriate trade-off studies demonstrating the necessity.

5.4.3 PHST equipment data package. After completion of required proof of design testing, a technical data package sufficiently complete to fix the configuration of the PHST equipment item and suitable for procurement shall be prepared. This data package shall include all engineering drawings and data lists (to the same type and form prescribed for the deliverable end product) and a procurement specification (DOD Manual 4120.3M) converted from the equipment development specification if all pertinent details cannot be included in the drawings.

5.4.4 Product specification conversion. After design, test, and approval, the pertinent configuration of the item ready for shipment in its container (shipping condition) shall be incorporated in section 5 of the applicable deliverable product specification, as shall pertinent unit load designs and vehicle loading configurations, where required (see 5.4.5 and 5.4.6). One of the following methods shall be used, listed in the order of preference.

5.4.4.1 Shipping condition drawing. Cross-reference shall be made to shipping condition drawing (and an associated data list, where required). This shipping condition drawing shall also be listed in the applicable associated data list (if required) for the deliverable product. The shipping condition drawing shows the item in the container assembly plus such additional devices as desiccant, security seals, metal strapping, or indicators which are not normally procured as a part of the container assembly.

5.4.4.2 Detailed description in specification. If the container assembly and packing details are fairly simple, a complete description, including figures as a part of the specification, shall be included in section 5. The description required is the same as that indicated for a shipping condition drawing.

5.4.4.3 Written description in specification. Where the container is very simple and conforms in every respect to a standard specification, a written description shall be included in the specification. Information included shall be explicit concerning the quantity contained, the container to be used, and all details including marking and closure. Gross weight and dimensions of the shipping condition configuration shall be stated.

5.4.5 Unit loads. Unit load (palletized or unpalletized) details shall be developed for shipments of smaller items suitable for unitizing where a considerable quantity may be shipped to the same destination. Design and test of unit loads is mandatory for all ammunition and explosive deliverable products suitable for unitizing. For inert items, the palletizing pattern shall be selected from MIL-STD-147 and indicated as a contracting officer's option. Unit load configurations so developed shall be included in section 5 of the deliverable item specifications.

5.4.6 Vehicle loading configurations. Vehicle loading configurations shall be developed for all transportability problem items, all items to be shipped regularly on open top equipment (whether or not in containers), and all items to be shipped uncrated and not incorporated into unit loads (see 5.3.4.1a). For items which are not oversize (as defined in MIL-STD-1366), required vehicle loading configurations shall be developed for both truck and rail transportation. For oversize items, the vehicle loading configurations shall be developed only for those transportation modes the design activity proposes for use (see 5.3.4.1b).

5.4.6.1 System/equipment integrity. Where the deliverable product is disassembled for shipment, particularly after system acceptance testing, the vehicle loading configuration shall show all elements of the deliverable product, even if more than one vehicle is required.

5.4.6.2 Equipment clearance diagram. The contractor shall develop an equipment clearance diagram for all wheeled and tracked vehicles. An equipment clearance diagram shall be prepared for all uncrated oversize items which (as shown by the logistics study) may be shipped over the rail and road network of foreign countries.

5.4.7 Nomenclature. The contractor shall obtain official nomenclature for all fully reusable containers and for all handling equipment to be used by the services.

5.4.8 Proof of design testing. The contractor shall conduct proof of design testing on each item of PHST equipment (including unit loads and shipping configurations) developed hereunder in accordance with the tests pertinent to that equipment specified in the PHST development specification (or equivalent) and as required by the system test and evaluation plan. Test results shall be documented as required.

5.4.9 Equipment releases. The contractor shall obtain approval of the procuring service (through or by its designated PHST representative) for selected items of PHST equipment before adoption for full production. The following categories of PHST equipment require prior service approval:

(a) Containers, unit loads, and vehicle loading configurations for ammunition, explosives, and other dangerous articles, including radioactive materials

(b) Handling equipment for the items categorized in (a) above, in or out of containers

(c) PHST equipment (including unit loads and vehicle configurations) for all other transportability problem items

(d) PHST equipment and procedures for system prime and critical items

(e) PHST equipment and procedures for high value components singled out by the procuring service for intensified supply management

(f) PHST equipment and procedures for combat consumables, not otherwise mentioned herein

(g) PHST equipment and procedures for repairable components and assemblies, with particular emphasis on those components and assemblies which will be used at the organizational and intermediate maintenance levels (including repair ships and tenders) but will themselves be overhauled by depot level maintenance.

5.4.10 Integrated logistic support of PHST equipment. All fully reusable containers and all handling equipment to be used by the services shall be considered to be deliverable items and shall be subject to the same integrated logistic support actions as other equipment to be delivered. Examples of pertinent data which may be required elsewhere in the contract are provisioning parts breakdowns and other provisioning data, PHST equipment maintenance instructions, and instructions on how to use the equipment for the purpose intended.

5.4.11 Special processes. The contractor shall develop such special PHST processes as may be necessary to insure continued integrity of the system equipment throughout its life cycle. Included herein, but not necessarily limited thereto, are:

(a) Procedures for preserving aircraft for transportation by surface ship, by air, and for storage in specified locations

(b) Procedures for preserving tanks and other major vehicles in designated reserve pools

(c) Procedures for preserving major equipments installed in ships during installation (including backlog storage) at shipyards and in the reserve fleet and for these equipments when removed from the ships for prolonged storage ashore as part of a mobilization reserve.

5.4.12 Material safety data. Where new materials are proposed for use in support of the system, necessary safety information for such materials shall be developed in accordance with FED-STD-313.

5.5 Production phase.

5.5.1 PHST program execution. The PHST equipment developed as a part of the product baseline shall be produced in accordance with the PHST program and the applicable contract requirements.

5.5.2 Additional PHST engineering. Packaging procedures and containers for repair parts shall be developed, tested as necessary, and documented as required by the applicable data requirement. Guides to the degree of reusability shall be taken from the results of the maintenance engineering and training analysis (5.4.1.1). The contractor shall avoid designing packages for items which are not to be bought by the Government through the provisioning process. New designs shall be documented as required.

5.5.2.1 Federal stock numbering. The contractor shall take stock numbering screening action in accordance with MIL-P-84000.

5.5.3 PHST monitoring. The contractor shall monitor the performance of PHST equipment and shall establish appropriate feedback and controls to assure that design deficiencies are identified and corrected through appropriate engineering change proposals. This monitoring shall continue as required by the appropriate contract or contracts.

6. NOTES

6.1 Intended use. This standard is intended to be used in contracts for major systems and equipment to control the development, design, and use of adequate packaging, handling, storage, and associated equipment and procedures for the system/equipment. It can, and should, be tailored to the complexity of the system/equipment being procured and the life cycle phase.

6.1.1 Management list. Use of this standard to prescribe management effort has been approved by the Department of Defense, and it is listed as Number 21534 in Department of Defense Manual 7000.6M, Authorized Management Control Systems List.

6.1.2 Engineering for transportability. The overall scope of the engineering for transportability program is contained in Joint Regulation: DSAR 4500.25; AR 70-44; OPNAVINST 4600.22A; AFR 80-18; MCO 4610.14B.

6.1.3 MIL-STD-648. At time of release of this document, MIL-STD-648 was in final stages of coordination but still had some unresolved problems. Pending final release, procuring activities should use their service peculiar documents.

6.2 Tailoring. Each time this standard is used in contracts, each of its paragraphs must be considered by the procuring activity for applicability of each paragraph. While not contractually binding, nor construable as restrictive to the bidder's proposal, table I provides general guidance concerning applicability of the various paragraphs.

Table I. Guidance to Application of this Standard

| Para. | Title | Life cycle phase[1] | | | |
|---|---|---|---|---|---|
| | | C | V | FSD | Prod |
| 4.1 | PHST program | A | A | A | A |
| 4.3.1 | Transportation and delivery mode dimensional constraints | A | A | A | A |
| 4.3.2 | Deliverable product compatibility | A | A | A | P |
| 4.3.3 | Handling equipment design criteria | N | N | A | P |
| 4.3.4 | Packaging design criteria | N | N | A | A |
| 5.1 | PHST program requirements | N | A | A | P |
| 5.1.2 | Distribution and delivery concepts | A | A | A | N |
| 5.1.3 | Special storage and stowage requirements | N | A | A | P |
| 5.1.4 | Additional elements of the PHST program | N | P | A | P |
| 5.2 | PHST performance baseline | A | N | N | N |
| 5.3.1 | PHST program | N | A | N | N |
| 5.3.2 | Screening existing equipment | N | A | N | N |
| 5.3.3 | Determining specific PHST design requirements | N | A | N | N |
| 5.3.4 | PHST development specifications | N | A | N | N |
| 5.3.5 | Deliverable product specifications | N | A | N | N |
| 5.3.6 | Inventory item specifications | N | A | N | N |
| 5.4.1 | Additional PHST requirements and analysis | N | N | A | N |
| 5.4.2 | Program execution | N | N | A | N |
| 5.4.3 | PHST equipment data package | N | N | A | N |
| 5.4.4 | Product specification conversion | N | N | A | N |
| 5.4.5 | Unit loads | N | N | P | N |
| 5.4.6 | Vehicle loading configurations | N | N | P | N |
| 5.4.6.2 | Equipment clearance diagram | N | N | P | N |
| 5.4.7 | Nomenclature | N | N | A | N |
| 5.4.8 | Proof of design testing | N | N | A | N |
| 5.4.9 | Equipment releases | N | N | A | N |
| 5.4.10 | Integrated logistic support of PHST equipment | N | N | A | N |
| 5.4.11 | Special processes | N | N | P | N |
| 5.4.12 | Material safety data | N | N | A | N |
| 5.5.1 | PHST program execution | N | N | N | A |
| 5.5.2 | Additional PHST engineering | N | N | N | A |
| 5.5.3 | PHST monitoring | N | N | N | A |

[1] C = conceptual phase; V = validation phase; FSD = full scale development phase; Prod = production phase; A = generally applicable; P = possibly applicable; N = generally not applicable.

6.2.1 How to tailor. For this standard to be invoked in a contract, it is necessary to include it in the Management Control Systems Summary List, DD Form 1660, made a part of the request for quotation and the contract. Figure 2 illustrates a representative tailored requirement. Only the paragraphs mentioned in the remarks block are applicable to the contract. In the instant case, the acquisition manager was moving into the engineering development phase of a major new system. With the results of the definition phase studies in hand, he knew that he was faced with one transportability problem item because of large size and weight of a major system component. He was also aware that he had an ammunition item to package and that it would require explicit palletizing, carloading, and truckloading instructions. He has also made the decision that he wants these latter instructions to be prepared by the contractor.

| MANAGEMENT SYSTEMS SUMMARY LIST | | | | SOLICITATION/CONTRACT NUMBER N0017-C-1234 |
|---|---|---|---|---|
| 1. ENTRY | 2. DOCUMENT NUMBER | 3. DATE | 4. TITLE | |
| 5 | MIL-STD-1367 | 01/02/72 | Packaging, Handling, Storage, and Transportability Program Requirements (For Systems and Equipment) | |
| 5. AMSL EDITION DATE | 6. AMSL NUMBER/CONTR. APPL./AUTHORITY (Specify) | | | 7. FUNCTIONAL CLASS. |
| March '72 | 21534/1 | | | 03 |
| 8. DATA REFERENCES (if any) | | | | |
| DD 1423 Nos. L001, L002, L003, L004, L005, L006, L007, L008, and L009 | | | | |
| 9. REMARKS | | | | |
| Paragraph 5.1 and subparagraphs 5.4.1 through 5.4.10 apply. | | | | |
| 1. ENTRY | 2. DOCUMENT NUMBER | 3. DATE | 4. TITLE | |
| | | | | |
| 5. AMSL EDITION DATE | 6. AMSL NUMBER | | | |
| | | | | |
| PREPARED BY (Name, Title and Grade) | | DATE | APPROVED BY (Name, Title and Grade) | DATE |
| A. B. See, GS-XX<br>Management Systems Coordinator | | XXX | C. D. Eff, Capt., USNavy<br>Project Manager, Colossal Systems | XXXX |

DD FORM 1 MAR 71 1660 PREVIOUS EDITIONS ARE OBSOLETE. PAGE ___ OF ___ PAGES

Figure 2. An Example of a Tailored PHST Management Requirement

6.2.2 Time phase tailoring. Table I indicates an optimum time phasing pattern such that the PHST equipment production baseline establishment coincides with establishment of the deliverable product baseline. Ideally this is the way it should be done since, in the final analysis, the container is a part of the deliverable product as it stands on the shipping dock ready for formal transfer to Government ownership. It will be noted, however, that in terms of the total number of designs, the bulk of them will be produced during the production phase as the repair parts configurations materialize. For a simple system with a relatively few prime deliverable items and with a long lead time from contract to first delivery, the acquisition manager may choose to postpone PHST engineering to the production contract. In such a case, the acquisition manager should select the paragraphs pertinent to the PHST definition phase and use them in the system engineering development phase contract. When the production contract is written, the pertinent paragraphs applicable to PHST engineering development phase and the production phase would be referenced.

NOTE: This option should never be exercised on ammunition, explosives, or other dangerous articles since many safety tests and evaluations require availability of the specific container design proposed for use. It should rarely, if ever, be exercised on transportability problem items since unpleasant surprises may ensue.

6.3 Data. Selected data items in support of this standard will be reflected in a Contractor Data Requirements List (DD Form 1423) supported by Data Item Descriptions (DD Form 1664) attached to the request for proposal, invitation for bid, or the contract, as appropriate.

6.3.1 Supporting data item descriptions. Table II contains a list of paragraphs of this standard which may require specific data item descriptions if specific data items are required to be delivered. Appropriate data item descriptions will be prepared, standardized as appropriate between the services, and cross-referenced herein by subsequent amendment. It will be noted that table II does not include data items normally required by other portions of the contract such as specifications, engineering drawings and associated data lists, manuals, and provisioning data. If the PHST equipment design is broken out for separate procurement, such data requirements would have to be added to those listed here.

Table II. Paragraphs Which Generate Potential Data Requirements

| Para. No. | Title |
|---|---|
| 5.1.2 | Distribution and delivery concepts |
| 5.1.3 | Special storage and stowage requirements |
| 5.3.3.1 | Trade-off studies |
| 5.4.4.1 | Shipping condition drawing |
| 5.4.6 | Vehicle loading configurations |
| 5.4.6.2 | Equipment clearance diagram |
| 5.4.7 | Nomenclature |
| 5.4.11 | Special processes |
| 5.4.12 | Material safety data |
| 5.5.2 | Additional PHST engineering |

Custodians:
Navy—OS
Army—MI
Air Force—69

Preparing activity:
Navy—OS
(Project No. PACK-0406)

Review activities:
Army—AD, AT, AV, CE, GL, ME, MI, MU, SL, SM, TM, WC
Navy—AS, EC, MC, SA, SH, YD
Air Force—10, 11, 13, 15, 16, 17, 18, 19, 69, 70, 71
Other—MTMTS, DSAH

# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

*(See Instructions – Reverse Side)*

| 1. DOCUMENT NUMBER | 2. DOCUMENT TITLE |
|---|---|
| | |

| 3a. NAME OF SUBMITTING ORGANIZATION | 4. TYPE OF ORGANIZATION *(Mark one)* |
|---|---|
| b. ADDRESS *(Street, City, State, ZIP Code)* | ☐ VENDOR<br>☐ USER<br>☐ MANUFACTURER<br>☐ OTHER *(Specify)*: _____ |

5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

6. REMARKS

| 7a. NAME OF SUBMITTER *(Last, First, MI)* – Optional | b. WORK TELEPHONE NUMBER *(Include Area Code)* – Optional |
|---|---|
| c. MAILING ADDRESS *(Street, City, State, ZIP Code)* – Optional | 8. DATE OF SUBMISSION *(YYMMDD)* |

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