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LOGISTICS PACKAGING MANAGEMENT

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FIELD MANUAL

LOGISTICS PACKAGING MANAGEMENT

DEPARTMENTS OF THE ARMY, THE NAVY, THE AIR FORCE
AND THE DEFENSE LOGISTICS AGENCY

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DEPARTMENTS OF THE ARMY
THE NAVY, THE AIR FORCE
AND THE DEFENSE LOGISTICS AGENCY
WASHINGTON, DC, *11 August 1988*

LOGISTICS
PACKAGING MANAGEMENT

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PART ONE
INTRODUCTION
CHAPTER 1
GENERAL

1-1. Purpose and Scope

a. Purpose. This manual contains information on packaging management and its implementation by the Army, Navy, Air Force, Marine Corps, and the Defense Logistics Agency. It is published for use as an official document to support operations and the training of individuals and units of the Armed Forces. It is based on policy and doctrine issued by the Defense Logistics Agency and the various services. It is intended to improve management responsibilities in regard to packaging administration matters.

b. Scope

(1) *General.* The subject matter of this manual covers one of the elements of the science of logistics. Packaging, in its broadest sense, is that element which enhances handling in shipment and storage and provides life cycle protection to material from point of origin to the consumer and ultimate use, return, or disposal. It is a factor in all the other logistics elements and influences and is in turn affected by procurement, contract administration, quality assurance, transportation, and storage. The subject is developed in the remaining parts of this manual as follows:

(2) *Part Two—Packaging as a Logistics Management Function.* This part discusses the history and concepts of the Department of Defense policy documents concerning packaging and related areas, the implementation of these policies by the Defense Supply Agency and the military services, the internal organizations that have developed to serve this function, the impact of these policies on all logistics operations, and the realized and anticipated benefits from adhering to these guidelines.

(3) *Part Three—Relation of Packaging to Logistics Elements.* This part contains a discussion of the vital part that packaging plays in the successful completion of logistics missions, including procurement, contract administration, quality assurance, transportation, storage, and depot operations.

(4) *Part Four—Management Considerations in Packaging.* This part includes the application of management tools, such as automatic data processing systems to packaging. Packaging standardization, the value of training in packaging for all logistics personnel and the future of packaging are also discussed in this part.

1-2. Recommended Changes

Users of this publication are encouraged to submit recommended changes or comments to improve the manual. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended.
Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications and Blank Forms) and forwarded direct to Dean, School of Military Packaging Technology, ATTN: AMXMC-SMPT-T Aberdeen Proving Ground, MD 21005-5001.

PART TWO
PACKAGING AS A LOGISTICS MANAGEMENT FUNCTION
CHAPTER 2
PACKAGING WITHIN THE DEPARTMENT OF DEFENSE

Section I. BACKGROUND AND HISTORY OF PRESENT PACKAGING POLICY

2-1. The Keystone of Logistics

a. The lexicographers have defined "logistics" as "the branch of military science concerned with the mathematics of transportation and supply and the movement of bodies of troops." Others include the quartering of troops in their definitions. In the narrow sense of these definitions, then, a logistician is primarily concerned with quantities, distances and time. In other words, how many and what kind of vehicles, weapons, repair parts and supporting equipment will a body of troops require for a module of time. How will the troops be sheltered, and how much subsistence will be required are also problems the logistician has to solve.

b. One of the prime logistical functions is that of supply. The problems involved here are not only how many or how much of each item will be required, but also, when will the materiel be used, where will it be stored, and how will it be moved. It is in this area that the logistical functional manager must of necessity concern himself with the importance of packaging—and be sure that qualified specialists are doing their work.

c. If an effective body of troops is to be adequately supported, all items of supply must be delivered to them in ready-for-use condition. Broken, rusted or otherwise deteriorated materiel supplied to the unit represents a waste of money, manpower, transportation and storage facilities and results in reducing the effectiveness of the troop unit.

d. Adequate protective packaging, using approved materials applied in accordance with prescribed methods, will reduce losses due to breakage and deterioration to a minimum. Austere funding and budget restrictions have often resulted in a reduction of packaging protection applied to items of military supply. Such actions may well be termed "penny wise and pound foolish." For to save a dollar in packaging costs, only to lose a ten, twenty or thousand dollar item as a result, is the epitome of financial irresponsibility.

e. The objective of the military in the packaging function is to provide adequate protection at a minimum cost. The emphasis in implementing this policy must be on the adequate protection, with cost factors being secondary in importance.

f. What value is there in moldy bedding, inedible subsistence and rusted or broken repair parts other than the lowering of morale and the resultant ineffectiveness of the troop unit? Is this the pay-off we are looking for when we buy or condone inadequate packaging protection in the name of Cost Reduction? Don't sell packaging short! It is the Keystone of Logistics supply system. Without adequate packaging the system would fall apart.

g. Considering recent improvements in technology, materials, negotiation in procurement, and transportation units, packaging cost reduction can be achieved without loss of protection. Such developments as foamed-in-place packaging, shrink film palletizing and the use of intermodal vans in the transportation system have contributed greatly to lowered packaging costs and improved protection.

h. The packaging specialist who is concerned with protection of the item must be cognizant of these developments and use them wherever possible. In fact, the packaging specialist must stay abreast of all new packaging developments in order to successfully achieve the mission assignment. The packaging specialist must work closely with transportation and storage specialists and procurement personnel to make certain that proper, adequate packaging is required by the contract, and that the packaging is designed to withstand the hazards of the known or anticipated transportation and storage environments.

i. The same holds true in the case of materiel shipped from depot stock. What may appear to be adequate protection in the confines of a CONUS depot warehouse may be grossly inadequate protection when the packs are shipped to oversea destinations.

j. One of our chief concerns in supplying the troops is "reliability." A weapon must fire, a vehicle operate and a computer compute as soon as it is placed into service. We build reliability into our systems—let's not lose it in the packing department.

k. Let everyone concerned with supply adopt the attitude that the security of the nation may be wrapped in the container being designed, the package being fabricated, or the box being handled.

2-2. General History and Political Background

a. General. From the days of the Colonies and the Revolutionary Army until our entry into World War II, no special emphasis was placed on packaging our military supplies and equipment.

(1) Oiled paper, oiled silk, grease, and, in the years between World War I and World War II, a compound known as cosmoline were about the only barriers between our materiel and its environment.

(2) In the container field, the nailed woodbox and the crate were relied upon almost exclusively.

(3) Our relatively short supply lines during wars that were fought within our continental limits and the negligible amount of storage during the periods between wars did not demand the creation of a packaging technology more sophisticated than had been developed by commercial interests.

(4) After World War I, the War Department was faced with great quantities of surplus arms, ammunition, and other equipment; and some research was done on the prevention of corrosion, and many of our stored weapons were protected by the application of cosmoline.

(5) Immediately after our entry into World War II, with supply lines stretching halfway around the globe, our combat leaders and supply officers were shocked by the fact that less than half our materiel was arriving in usable condition, and that extreme storage conditions and rough handling of materiel throughout our supply lines, especially on the Pacific islands, resulted in further deterioration before the frontline troops could be provisioned. Also adding to the delirium was the receipt of shipping containers not identifying their true contents due to lack of proper marking.

(6) Research on corrosion prevention and studies in packaging technology and containerization that had been progressing slowly in the peacetime years were accelerated. Specifications on packaging materials were developed concurrently with packaging specifications and manuals of instruction on the selection, application, and use of these specialized materials, containers, and techniques.

(7) Both the Army and Navy sponsored crash programs of research and development in packaging, and with the cooperation of civilian agencies of the Government (such as the Forest Products Laboratory) and industry established training programs for personnel engaged in packaging.

(8) As a result of this concerted effort by all military and civilian agencies and industry, at the end of World War II our deterioration rate of military supplies in the provisioning pipeline was cut down to less than 5 percent.

(9) The victorious end of World War II again brought a flood of surplus materiel into our ports and depots. At the same time, large numbers of military personnel with some training in packaging were released from the Armed Forces and the depots, faced with reduced budgets, were forced to cut back their civilian staffs.

(10) Many new procurements made during this period specified commercial packaging even though the materiel was destined for storage. This was evidently done in order to save procurement dollars, with no thought of future consequences.

(11) Consequently, a great quantity of unprotected or improperly packaged materiel found its way into our military warehouses.

(12) When our troops were sent into Korea as part of the United Nations Forces, we found that a large percentage of the materiel and equipment that had been stored during the 1947–50 period had deteriorated and portions were unsalvageable.

(13) Concurrently, with the growth of preservation and packaging problems in our standard hardware, the introduction into the supply line of items and equipment made wholly, or in part, of the "exotic" metals, such as magnesium, magnified the overall problem of affording adequate protection to our materiel.

(14) It was determined that positive steps would have to be taken to insure that money and materiel would no longer be wasted because of inadequate and improper packaging.

b. Action of the Congress.

(1) The office of the Secretary of Defense was established by Public Law 436, 82nd Congress, which has been codified as chapter 145, Title 10, United States Code.

(2) This act details the duties of that office, among which is the responsibility for insuring that military materiel is adequately protected against damage and deterioration during handling, shipment, and storage.

(3) As one of his acts in fulfilling the duties of his office, the Secretary of Defense, in July 1955, issued Department of Defense Instruction 4100.14, which instructs the military services in the basic policy for the uniform packaging and marking of items of military supply.

(4) The Instruction has been revised several times over the years, each occasion reflecting

deeper knowledge of military packaging and the latest state-of-the-art. The most recent revision emphasizes specific packaging policy and procedures, industrial packaging, and the uniform application of packaging requirements.

Section II. DEPARTMENT OF DEFENSE PACKAGING POLICY

2-3. Department of Defense Instruction 4100.14

This instruction establishes policies and criteria for use by Department of Defense components in developing uniform regulations governing the preservation, packaging, packing, and marking of items of supply to assure their protection from deterioration and damage during shipment, handling, and storage from time of original purchase until used.

2-4. Joint Packaging Policy Publication

a. The implementing force of DOD Instruction 4100.14 is the joint regulation, AR 700-15/NAVSUPINST 4030.28 AFR 71-6/MCO 4030.33 DLAR 4145.7 titled, Logistics—Packaging of Materiel.

b. This regulation describes three levels of protection applied equally to the preservation and packing functions and designed to protect supplies and equipment against transportation, environment, and other hazards during the logistical cycle.

(1) A levels of protection is the amount of protection afforded supply items against known or anticipated shipping, handling, storage, and environmental hazards to insure their usability wherever and whenever needed.

(2) The amount of protection is proportional to the severity of the hazard as may be seen in the following discussion.

c. Levels of protection are determined from the following criteria:

(1) Level A. Preservation and packing so designated must protect materiel against direct exposure to extremes of climate, terrain, and operational and transportation environments without protection other than that provided by the pack. Other conditions include—

(*a*) Multiple handling during transportation and intransit storage from point of origin to final user.

(*b*) Shock, vibration, and static loading during shipment.

(*c*) Loading on shipdeck, transfer at sea, helicopter delivery, and offshore or over-the-beach discharge to final user.

(*d*) Environmental exposure during shipment or during intransit operations where port and warehouse facilities are limited or nonexistent.

(*e*) Outdoor storage in all climatic conditions for a minimum of 1 year.

(*f*) Static loads imposed by stacking.

(2) Level B. This protection must preserve materiel against physical damage and deterioration during such favorable conditions as—

(*a*) Multiple handling during transportation and intransit storage.

(*b*) Shock, vibration, and static loading of shipment worldwide by truck, rail, aircraft, or ocean transport.

(*c*) Favorable warehouse environment for a minimum of 18 months.

(*d*) Environmental exposure during shipment and intransit transfers, excluding deck loading and offshore cargo discharge.

(*e*) Stacking and supporting superimposed loads during shipment and extended storage.

(3) Level C. The following criteria will determine the requirements for this degree of protection.

(*a*) Use or consumption of the item at the first destination.

(*b*) Shock, vibration, and static loading during the limited transportation cycle.

(*c*) Favorable warehouse environment for a maximum of 18 months.

(*d*) Effects of environmental exposure during shipments and intransit delays.

(*e*) Stacking and supporting superimposed loads during shipment and temporary storage.

2-5. Industrial Packaging

a. This form of packaging has assumed growing importance in recent years. Not without pitfalls, commercial packaging nevertheless has proved cost-effective in many areas.

b. Industrial packaging may be defined as "the preservation or packing protection provided by commercial suppliers to their commercial customers," or as "the methods and materials employed by the supplier to satisfy the requirements of the commercial distribution system." Industrial packaging may be applied by either private industry or a military installation.

c. It is used whenever logistic conditions justify and may be used to satisfy any level of protection whenever the technical design details of the package meet all conditions of the level of protection specified.

Section III. WHAT DOD PACKAGING POLICY HAS ACCOMPLISHED AND WHAT IT EXPECTS TO ACCOMPLISH

2-6. Accomplishments

a. Prior to the promulgation of the first Department of Defense Instruction 4100.14 on preservation, packaging, packing, and marking of items of military supply, there had been no central authority to establish guidelines for the services on these subjects.

(1) Each of the services developed its own philosophy, concepts, and policy concerning the protection of materiel in the supply pipeline.

(2) There existed some close areas of cooperation as evidenced by the joint Army-Navy (JAN) specifications on packaging processes and materials developed during World War II.

(3) However, even staying within the general limits spelled out by these joint documents, each service headed in its own direction, influenced by its special problems in its own sphere of operations.

(4) This generated many problems for our suppliers who were confused by differing prescriptions for the same common item procured by the several technical services of the Army, and perhaps also by several of the Bureaus and Offices of the Navy and by the Air Force.

b. Department of Defense Instruction 4100.14 was not a panacea—it did not cure all these illnesses in our system overnight. It was not intended to do so. By staying within the guidelines and implementing this Instruction with their own regulations and directives, however, the services started on converging roads in the field of packaging which have only recently begun to merge into the unified concept of similar packaging for similar items. These efforts are being coordinated through the DOD Joint Packaging Coordinating Group (JPCG).

c. Persistent efforts in the areas of packaging standardization, reduction of tare weight and cube, and more intensive research and development in packaging materials and techniques have begun to pay off in overall cost reductions and cost avoidances.

d. The development of packaging cost standards to provide the procurement and contract administration offices with a basis for evaluating proposed charges for packaging has resulted in lower procurement expenditures and a firmer basis for review and negotiation.

e. The inclusion of value engineering and incentive clauses in contracts has also contributed to improved packaging materials and techniques at reduced costs through cooperation between the military and industry.

2-7. Future Expectations

a. The ideal pack has been described as one having no tare weight, no more cube than the item itself, no cost, and packaging materials that vanish upon removal from the item.

b. Although this goal is idealistic, nevertheless packaging technology and materials are continuously aimed towards it.

c. Packaging standardization projects are bringing more uniformity into our packaging prescriptions.

d. Current studies involving both containerization or load unitization and modes of transportation emphasize the interdependence of these two elements of the science of logistics to assure timely, reliable provisioning of our combat elements.

e. Through standardization, research and development, and wholehearted implementation of the Department of Defense packaging policies, our packaging program is furnishing more reliable protection at lower cost and packaging more easily handled at less expenditure of transportation funds.

CHAPTER 3
PACKAGING WITHIN THE DEFENSE LOGISTICS AGENCY (DLA)

Section I. GENERAL PACKAGING POLICIES

3-1. DLA. Implementation of Department of Defense Policy

a. Department of Defense Instruction 4100.14 is implemented in DLA by DLAR 4145.7—a joint Military Service/DLA publication.

(1) It is applicable to Headquarters, DLA, Defense supply centers, depots, service centers, having a logistics mission for DLA-managed items of supply, and Defense Contract Administration Services (fig. 3-1).

(2) Maintaining the regulation in a current status is a responsibility of the Chief, Depot Operations Division, Executive Directorate, Supply Operations, HQ DSA in conjunction with the Military Departments.

(3) Under the provisions of this regulation Commanders of supply centers:

(*a*) Assure that materials and procedures prescribed by appropriate standards and specifications are utilized in invitations for bid, contracts, and other purchase documents. Procedures will be stated in sufficient detail to preclude interpretation which may result in excessive, costly, or unessential materials and processes in completion of the package.

(*b*) Implement the policies and objectives of the DLA regulation, affording attention to—

1. The development and periodic review of preparation for delivery requirements for timely inclusion in specifications, standards, and other applicable documents.

2. Conservation of manpower, material, and money.

3. The development of uniform requirements utilizing a minimum of kinds, sizes, and types of packages and packaging techniques.

4. Cooperation with industry.

5. Development of data which will provide experience needed for more economical application of levels.

(4) Commanders of depots develop local procedures and controls to assure performance and accomplishment of preservation and packing functions in the most economical manner within the policies, objectives, and guidelines established in the regulation.

b. A study of the DLA Regulation 4145.7 shows that this agency has fully implemented the Instruction issued by the Department of Defense.

(1) It emphasizes the employment of the least costly levels and methods of packaging which will provide required protection.

(2) Items awaiting disposal as salvage, excess, obsolete, or surplus will be afforded only such preservation, packaging, and packing which may be required to retain the item in the condition existing at the time disposition action was determined.

(3) Unserviceable, economically repairable items, held in storage awaiting shipment or a repair facility or awaiting repair, will be afforded only such preservation, packaging, and packing which may be required to retain the item in the condition existing at the time of receipt and to prevent further deterioration or damage due to the hazards to which they may be subjected during shipment, handling, and storage.

Section II. DLA PACKAGING ORGANIZATION

3-2. DLA Packaging Responsibilities

a. Headquarters, DLA. Two elements, Supply Operations and Contract Management, have packaging responsibility.

(1) Packaging is one of the assigned functions of the Distribution Programs Branch, Depot Operations Division, Executive Directorate, Supply Operations (fig. 3-2). It—

(*a*) Develops policy, criteria, methods and procedures; and administers the preservation, packing, and marking program for the acquisition receipt, storage, and preparation for delivery of DLA-managed materiel.

(*b*) Acts as the DLA focal point and represents DLA with DOD, the Military Departments, other Federal agencies, and industry, on preservation, and packing matters including membership to the DOD Advisory Group for the School of Military Packaging Technology, the Joint Packaging Coordinating Groups, other boards, and committees.

(*c*) Provides staff assistance and monitors DSC technical operations in obtaining and utilizing engineering support services for the research and development and preservation and packing of DLA-managed materiel.

(*d*) Administers the program for prepara-

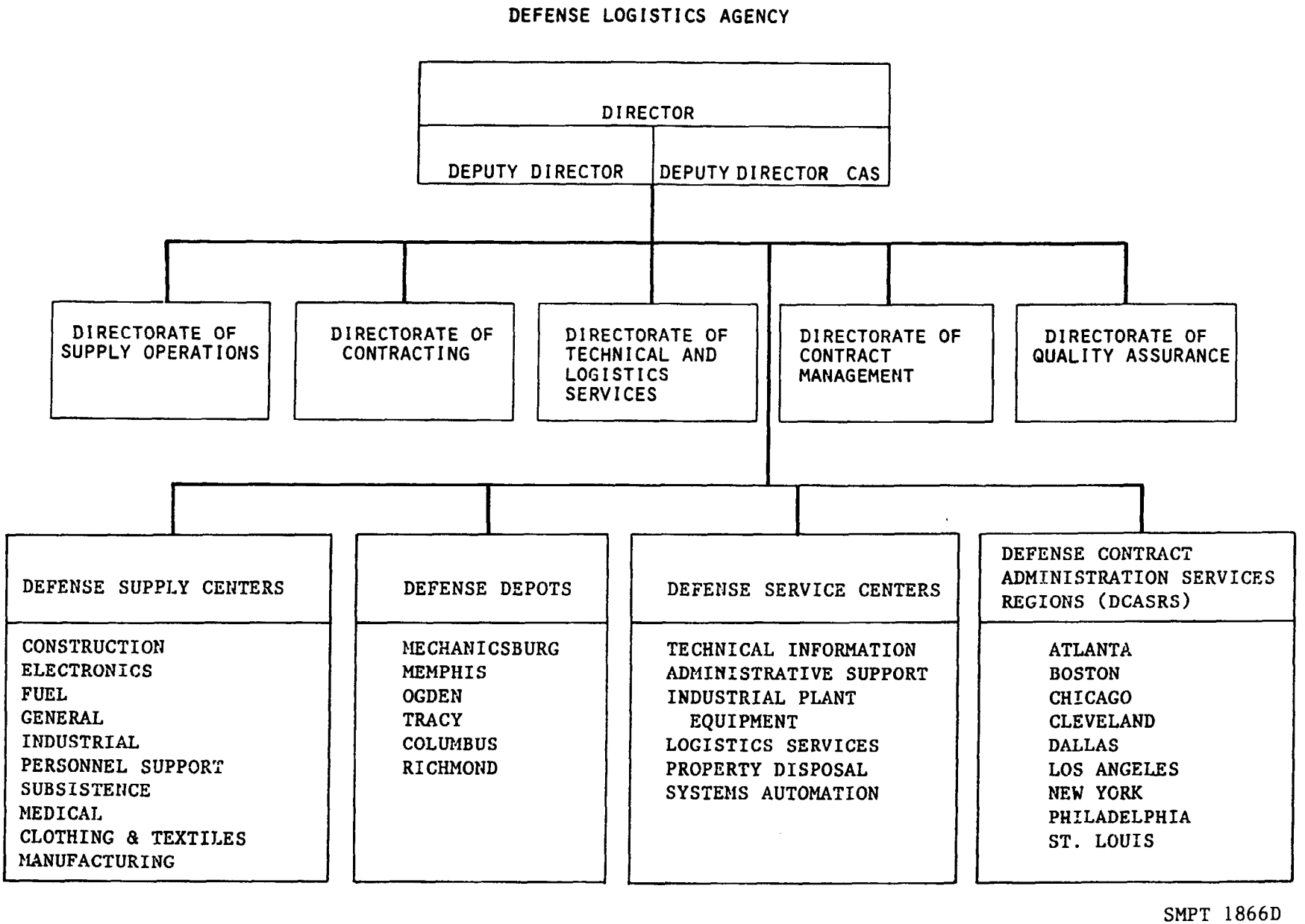

FIGURE 3-1. DEFENSE LOGISTICS AGENCY

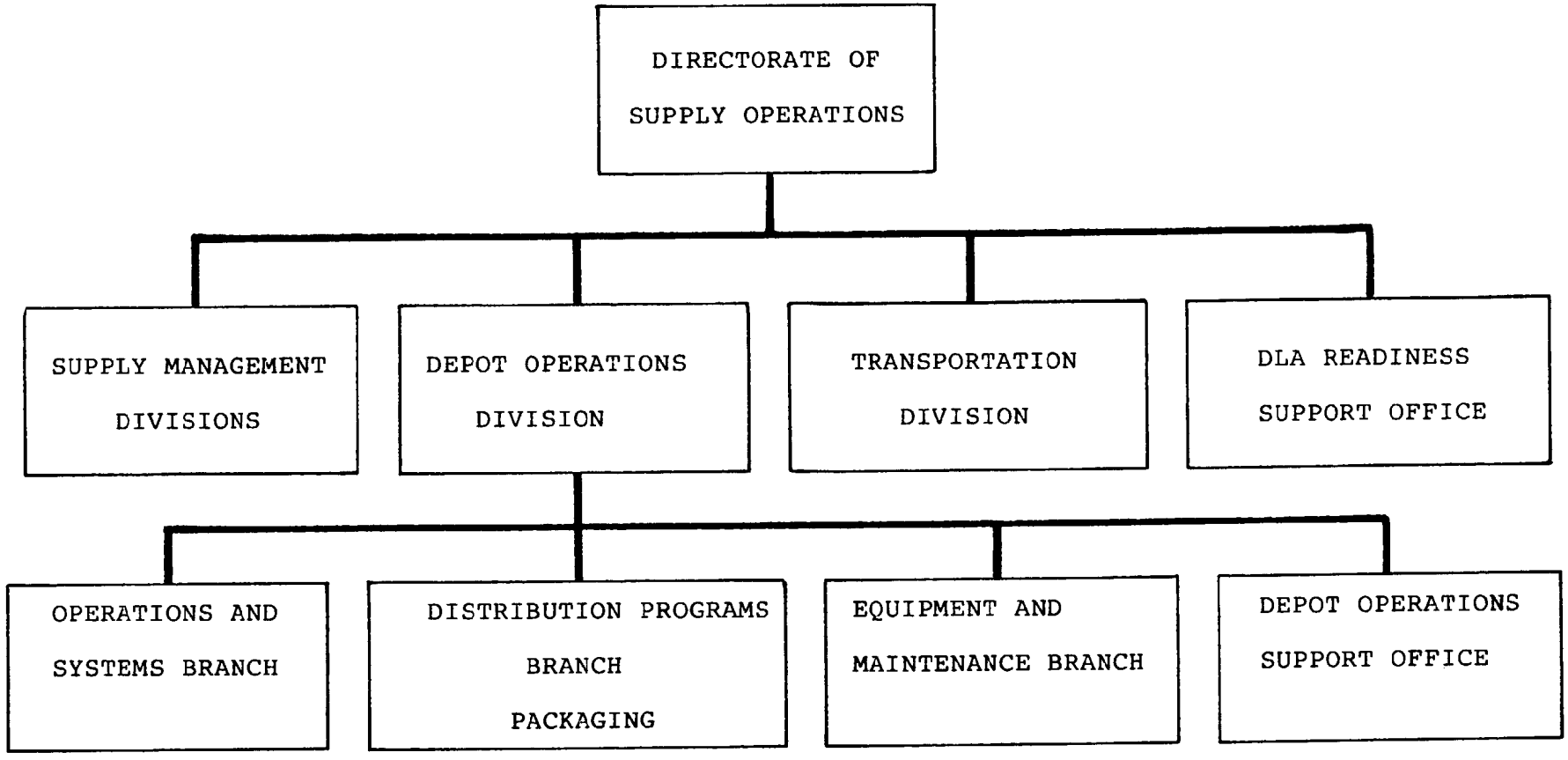

Figure 3-2. Directorate of Supply Operations

tion, review, coordination, maintenance, and custody of specifications and Military and Federal standards for preservation and packing of DLA-managed items. Maintains liaison with Government, industry, and industrial associations in coordinating industrial/commercial standards with Military Departments.

(*e*) Recommends standards for qualifications, training, and indoctrination of professional, technical, and supervisory employees concerned with storage and materials handling operations at DLA-managed activities.

(*f*) Monitors the development of Certification of Equivalency (COE) when military packaging does not meet the exact specification of the Department of Transportation.

(*g*) Establishes DLA packaging goals and objectives, as required.

(*h*) Operates the DLA Packaging Board as outlined in DLAR 4145.40.

(2) The Transportation and Packaging Division of the Contract Management Directorate (fig. 3-3) is responsible for the following functions related to contract administration:

(*a*) Advises the Executive Director on transportation, traffic management and packaging policies, plans and functions. Promotes DOD packaging and traffic management policy objectives of uniformity, economy and effectiveness.

(*b*) Participates in development of transportation and packaging regulations external to DCAS. In conjunction with other DOD elements, develops program policy as it affects the DCAS transportation and packaging mission. Initiates implementing procedures for DCAS transportation and packaging operations.

(*c*) Provides guidance to DCAS field activities on transportation, traffic management and packaging matters relating to contractor methods and procedures.

(*d*) Furnishes DCAS field activities technical advice on interpretations of contractual provisions in Army, Navy, Air Force, DLA and National Aeronautics and Space Administration (NASA) tracts assigned for administration. Develops procedures to be followed in implementing the contractual provisions.

(*e*) Establishes requirements and coordinates specialized traffic management and packaging training programs for DCAS activities and contractor personnel. Assists in development of specialized training courses.

(*f*) Develops reporting requirements to accurately reflect and measure the operation and effectiveness of DCAS transportation and packaging functions. Identifies problem areas, recommends corrective action, and monitors progress against programmed objectives.

(*g*) Provides focal point with contractors, carriers, NASA components, Military Departments and other Government agencies in all matters involving DCAS transportation, traffic management and packaging operations.

(*h*) Prepares responses to command or staff reviews involving transportation, traffic management or packaging matters.

(*i*) Maintains liaison with other DOD components and other Government and nongovernment agencies in all matters pertaining to transportability of material with particular emphasis on hazardous materials. Provides guidance on transportability to DCAS field activities.

(*j*) Provides representation of Federal Acquisition Regulation (FAR) sub-committees related to the functions of this division.

(*k*) Conducts staff visits to field activities.

(3) The Engineering and Technical Management Division of the Quality Assurance Directorate is responsible for the following functions related to contract administration:

(*a*) Develops policies, plans, programs, and procedures relating to quality and reliability assurance functions in support of Department of Defense activities, other Government agencies and foreign Government contracts as they pertain to packaging and marking for shipment of material.

(*b*) Provides staff technical guidance to DCAS Region Quality Assurance Representatives (QAR's) in resolution of quality packaging problems.

(*c*) Develops policy and procedures for evaluation of contractors' compliance with packaging requirements of procurements.

(*d*) Conducts staff surveillance and appraises the performance of regional quality assurance programs involving packaging. Provides improved instructions to the appropriate quality assurance activity when required.

(*e*) Evaluates and provides direction for the resolution of quality packaging deficiencies requiring the attention of the directorate.

(*f*) Initiates and develops, in cooperation with cognizant training authority, training programs, determined necessary for DCASR quality assurance activities in packaging.

b. Defense Supply Centers, DSC's, including the Defense Industrial Plant Equipment Center (DIPEC). Each DSC has the responsibility for preservation, packing, and marking of the materiel for which it has cognizance. Packaging is generally one of the assigned functions of the Directorate of Technical Operations, which—

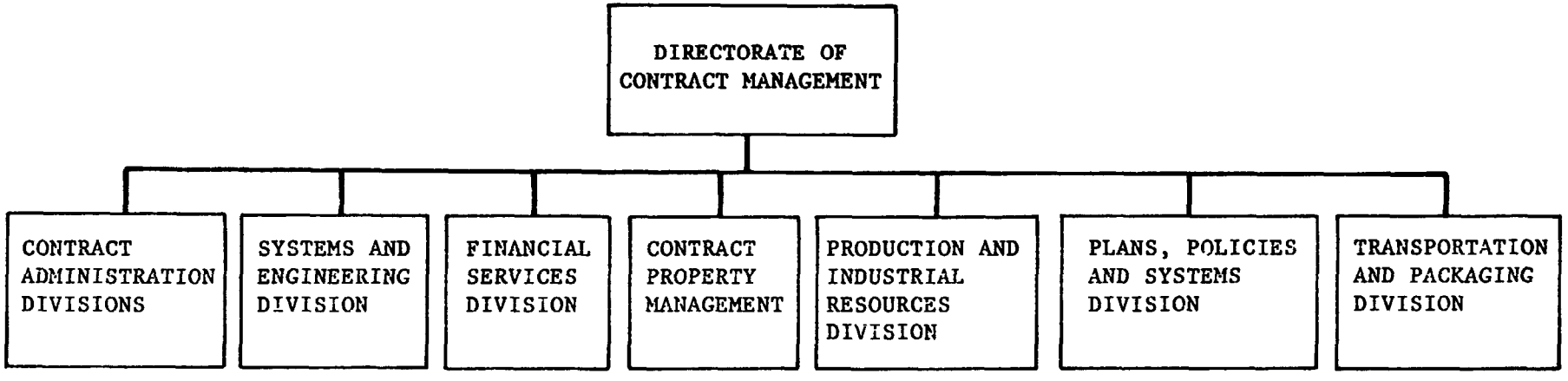

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FIGURE 3-3. DIRECTORATE OF CONTRACT MANAGEMENT

(1) Provides technical preservation and packing support to the contracting officer.

(2) Reviews procurement requests for technical adequacy of preservation, packing, and marking provisions.

(3) Determines/coordinates preservation, packaging and quantity unit pack requirements for DLA managed items. Resolves unit of issue discrepancies/conflicts as required.

(4) Provides computer input into the Contracting Technical Data File or Defense Integrated Subsistence Management System, as applicable for preservation and packing requirements of DLA managed items.

(5) Participates, as requested by the quality element, in preaward surveys for technical packaging support.

(6) Performs technical visits to manufacturers' plants to determine state-of-the-art technical packaging processes in order to harmonize commercial/industrial packaging capabilities with DoD packaging requirements.

(7) Serves as the packaging point of contact for Contract Review Office.

(8) Reviews and provides technical recommendations to the quality element on all requests for waivers or deviation to technical packaging requirements.

(9) Determines necessity for and prepares Special Packaging Instructions (SPI). Requests Military Services' development of SPIs, as appropriate.

(10) Researches, ensures resolution and takes corrective action on reports of packaging discrepancies forwarded from the quality element.

(11) Determine needs and initiates action for special projects, including laboratory test support from the Military Services or other Services, to evaluate proposed improvements in the packaging of DLA managed items.

(12) Provides technical guidance and support to storage and maintenance activities on packaging matters.

(13) Maintains cooperative liaison with DLA Headquarters and Primary Level Field Activities, Military Services, and other Government agencies regarding packaging matters.

(14) Participates in the DLA Packaging Board per DLAR 4145.40.

(15) Ensures that packaging awareness is included in all Center Orientation Briefings for newly assigned personnel.

c. Defense Contract Administration Service Regions, DCASR.

(1) At the DCAS regional level, contract administration packaging responsibilities are assigned to the transportation and packaging components, and Technical Support Division of the Quality Assurance Directorate. Inspection and acceptance of contractor packaging services are performed by the DCASR Directorates of Quality Assurance through their DCASMA's and DCASPRO's.

(*a*) The transportation and packaging components' functions are:

1. Develop internal procedures within the guidelines established by HQ DLA for performance of transportation, traffic management and packaging functions by transportation and packaging elements of regions, DCASMA's, and DCASPRO's.

2. Develops, implements, and monitors the DCASR packaging cost reduction program to ensure that conservation of funds is accomplished without sacrificing necessary protection; strives to reduce weight and cube.

3. Provides a review and approval of contractor-prepared packaging/materials handling data and design drawings, as required by contractual documents.

4. Participates in preaward surveys and contractors' estimating methods and procurement systems reviews.

5. Recommends action, to procuring activities, to promote uniformity and economy of packing/materials handling techniques, materials and methods.

6. Supports damage prevention control programs of other Government activities; develops, implements, and monitors the DCASR damage prevention control programs.

7. Provides technical assistance to contractors in their preparation of Defense Industrial Production Equipment and Government-furnished property for shipment and storage.

8. Reviews and evaluates contractor's packaging/materials handling price and cost proposals on individual procurements.

9. Maintains an awareness of all improvement programs and developments in the packaging field.

(*b*) The Technical Support Division, Quality Assurance Directorates' functions are as follows:

1. Develops internal procedures within the guidelines established by HQ DLA to assure accomplishment of the quality assurance program and performs staff supervision region-wide for preservation, packing and marking.

2. Investigates, coordinates and resolves major quality problems with the procuring and receiving activities.

3. Provides technical and engineering staff assistance in packaging for the Director of Quality Assurance and region field components.

(2) At DCASMA's and DCASPRO's:

(*a*) Transportation and packaging component functions by performing transportation, traffic management and packaging functions in accordance with regional procedures.

(*b*) Quality Assurance Office functions are—

1. Evaluates and performs surveillance over the contractors' systems and procedures in the area of preservation, packing, and container marking to assure conformance with contractural requirements.

2. Investigates quality deficiency reports; assures that corrective actions and preventive actions are taken.

d. Defense Depots.

(1) At the six defense depots, packaging management responsibilities are assigned to the Director of Distribution, Distribution Management Division and Production Control Branch.

(2) The depot packaging management functions control and coordinate packaging of materiel for the Distribution Directorate. In this capacity the depot packaging management—

(*a*) Provides technical direction, advice and policy guidance to Directorate elements on packaging management, including the functions of preservation, packing, crating, box fabrication, marking and unitization/palletization.

(*b*) Provides accredited off-campus instruction of military packaging technology courses to Directorate elements.

(*c*) Develops and maintains the packaging portion of the depot master replacement plan for obtaining, updating and replacing packaging equipment and systems.

(*d*) Develops and implements the depots' use of new packaging materials, containers and processes to increase work productivity.

(*e*) Schedules and conducts periodic surveillance reviews of depot packaging in receiving, warehousing, and stock maintenance functions to evaluate the effectiveness of those packaging operations and direct changes to improve operational effectiveness.

CHAPTER 4
PACKAGING WITHIN THE ARMY

Section I. GENERAL PACKAGING POLICIES

4-1. Army Regulation 700-15

a. Army Regulation AR 700-15, Logistics-Packaging of Materiel, is the Army implementation of DOD Instruction 4100.14.

(1) This document reflects the basic packaging policies of the Department of Defense as well as the Army's definition of areas of responsibility for the determination of the level of preservation and packing.

(2) It also provides guidelines for the selection of levels of protection, the establishment of preservation and packing quantities, the preservation and packing of repair parts, the protection of retrograde cargo/returned materiel, occupational safety and health programs, ecological considerations, and reporting of deficiencies/discrepancies.

(3) This regulation requires the procurement documents to include all pertinent details as to the packaging, packing, and marking of military supplies so that suppliers will be fully informed of military requirements.

(4) It emphasizes that adequate protection must be furnished our military supplies at minimum cost.

(5) Army policy, as expressed in this regulation, is that, when a choice of one of several shipping containers is permitted, the choice which provides adequate protection at the lowest overall cost, ecology considered, is to be selected.

b. Each of the major Army commands has the responsibility for the preservation and packing of the materiel for which it has cognizance.

4-2. The Army Packaging Board

a. Army Regulation AR 15-450 establishes and defines the mission, principal functions, and concept of operation of the Army Packaging Board.

(1) The mission of the Army Packaging Board is to formulate and recommend planning and policy criteria, and guidance on the packaging of Army materials. On matters pertaining to Army packaging, the Board will—

(*a*) Develop guidance and recommendations related to—

1. Organization of Army packaging activities.

2. Standardization of materials, methods, procedures and test methods.

3. Publications concerning or affecting packaging.

4. Packaging, Research, Development, Test and Evaluation (RDTE).

5. Packaging in procurement and supply operations.

6. Reduction of packaging costs.

7. Packaging reports and management measurement data.

8. Training for packaging activities.

(*b*) Coordinate and participate with other DOD elements in the development of joint packaging policies and criteria.

(*c*) Maintain liaison with technical societies and association, independent laboratories, educational institutions and other Government agencies on matters concerned with packaging or which have a direct relationship to packaging.

(*d*) Provide assistance, guidance, and participation in packaging expositions, symposiums and seminars.

(*e*) Prepare special studies, surveys and recommendations or other special actions on major packaging problems or matters.

(2) These missions and functions are performed by the Board as a whole or by small committees which report their conclusions and recommendations back to the Board.

(3) The Board is composed of a member and an alternate from each of the major subcommands of the AMC and The Surgeon General, as well as representatives of other interested Army agencies and activities.

(*a*) Each member, therefore, can bring the recommendations of the Board back to his own command and recommend implementation.

(*b*) Conversely, the requirements of each of the subcommands are submitted to the Board by the appropriate member for coordination and review.

(4) The chairman, vice-chairman, and secretary are appointed and furnished by the Commanding General, AMC.

(5) Headquarters, Department of the Army, furnishes broad general policy guidance for the Army Packaging Program to the Commanding General, AMC.

(6) The Board members keep themselves current with packaging developments and field operations by liaison visits to supply depots, terminals, R, D, and E Centers, and commercial packaging

contractors or laboratories.

(7) The recommendations of the Army Packaging Board are disseminated through their individual commands by the members. Where decision of higher authority is required, submission is through command channels.

b. General policy guidance for the Army Packaging Board is found in the following documents:

(1) AR 15-450, Boards, Commissions, and Committees, Army Packaging Board.

(2) AR 700-15, Logistics-Packaging of Materiel.

(3) AR 735-11-2, Reporting of Item and Packaging Discrepancies.

Section II. ARMY PACKAGING ORGANIZATION

4-3. The Deputy Chief of Staff for Logistics, Department of the Army

DCSLOG has the assigned responsibility for packaging for the Army. However, development and administration of the Army Packaging Program are primarily accomplished by the U.S. Army Materiel Command (AMC) (fig 4-1).

4-4. The Military Traffic Management Command (MTMC)

MTMC is the single manager operating agency for military traffic, land transportation, common user ocean terminals and highways for national defense. For the Department of Defense engineering for transportability program, MTMC executes the transportation oriented aspects assigned to the Department of the Army.

4-5. The MTMC Transportation Engineering Agency (TEA)

TEA produces land transportability criteria and guidance for DOD and performs functional analyses of transportation systems, as directed. While MTMC does not maintain a packaging organization/element by specific designation, TEA does conduct studies as requested in the area of packaging. With the approval of the Commander, such studies may be performed for any DOD element.

4-6. The U.S. Army Materiel Command (AMC)

As stated above, AMC has the primary responsibility for the development and administration of the Army Packaging Program. Within AMC, the Office of the Deputy Chief of Staff for Supply, Maintenance, and Transportation has the responsibility for implementing the AMC Packaging Program. AMC will—

a. Establish shipment, storage, and handling protection criteria for the guidance of AMC major subordinate commands and separate installations and activities reporting directly to AMC headquarters, in the preparation and application of packaging requirements in specifications, standards, data sheets, drawings, and packaging publications.

b. Provide policy and guidance for implementation of the packaging, storage, containerization, and transportation aspects of military standard systems.

c. Provide policy and guidance for expeditious handling and marking of classified, hazardous, sensitive, and special materiel, consistent with established safety and security policies and procedures.

d. Establish policy and provide guidance and direction for the operation of the Army Care of Supplies in Storage (COSIS) Program.

e. Determine data required to permit system analyses, measurement and evaluation of AMC systems and programs related to packaging. Directs the collection and correlation of such data, participates in its evaluation, and determines and directs corrective action as required.

f. Establish training objectives, policy and guidance for packaging.

g. Maintain surveillance over, and evaluate the performance of packaging accomplished within the Army supply system.

h. Supervise the Army Packaging Board and provide the chairman, vice-chairman and secretary of the Board (AR15-450).

i. Exercise technical direction over the AMC Packaging, Storage, and Containerization Center.

4-7. The AMC Packaging, Storage, and Containerization Center (PSCC)

A mission element of Tobyhanna Army Depot under the staff supervision of the Directorate for Supply, Maintenance, and Transportation, AMC headquarters, the PSCC performs functions in technical areas of packaging (excluding ammunition). In accomplishing these functions, it will—

a. Prepare packaging and care of supplies policy regulations, procedures, and operational guidance for Army, AMC depots and storage activities. The policies/procedures also serve to guide AMC subordinate commands in their preparation and application of packaging requirements in specifications,

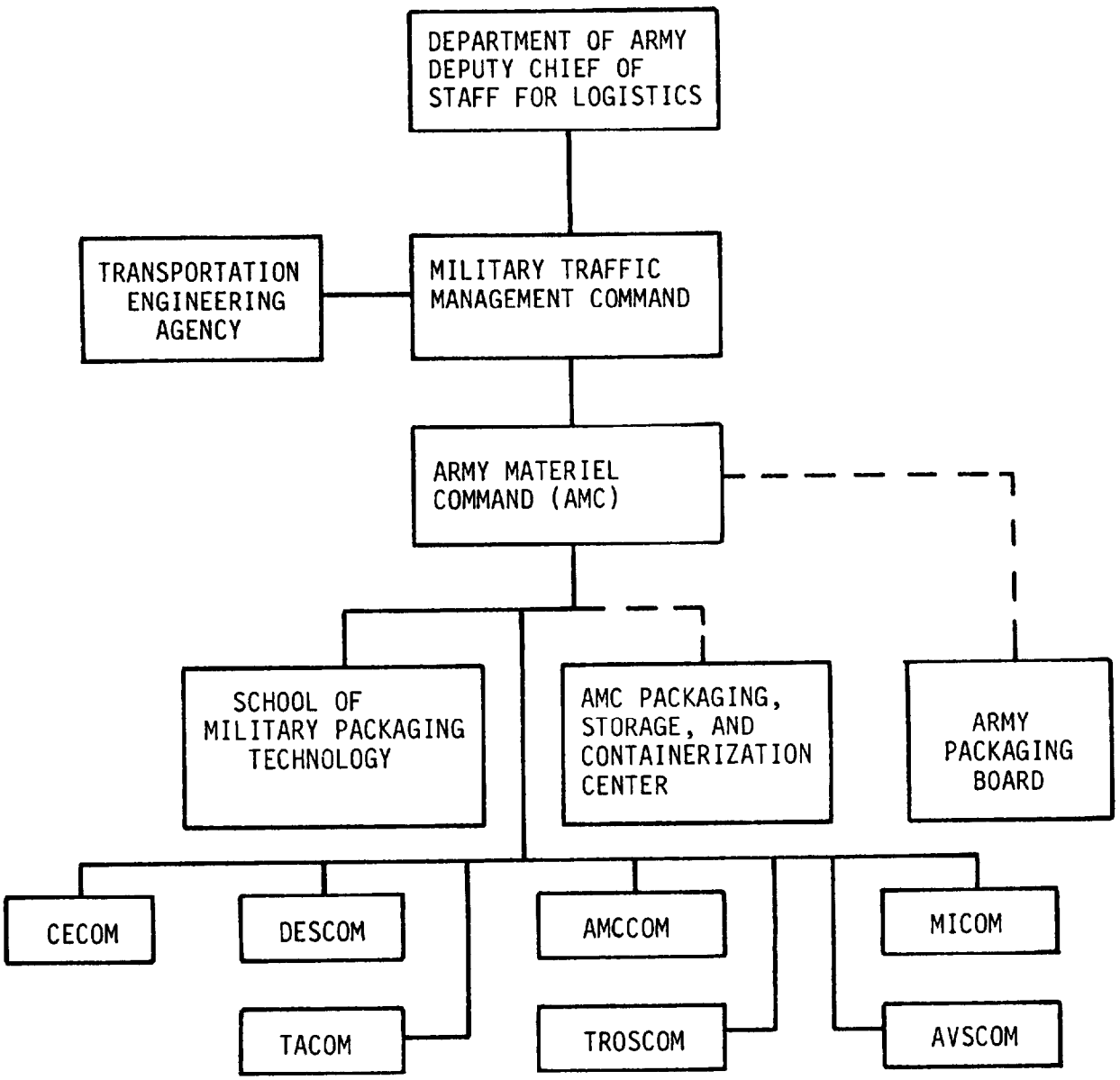


FIGURE 4-1. THE ARMY ORGANIZATION FOR PACKAGING

standards, data sheets, and other packaging publications.

b. Develop, prepare for publication, and maintain DOD instruction 4100.14, Packaging Materiel (and implementing joint service regulations) and the DOD 4145.19-R series of regulations dealing with modernization and standard methods for handling packaged military supplies for storage.

c. Ensure that packaging requirements are responsive to depot needs and are also suitable for use in procurement of Army materiel.

d. Perform DOD management functions for PACK Standardization Area and accomplish related standardization assignments.

e. Develop and coordinate Army marking requirements and exercise responsibility as Army custodian and DOD preparing activity for docu-

ments as assigned.

f. Monitor the performance and evaluate the effectiveness of the depot packaging and care of supplies programs.

g. Conduct a comprehensive review of the COSIS program through analysis of reports and during scheduled depot and command liaison visits.

h. Provide for and monitor the development and collection of packaging data for input to the packaging segment of the Army Master Data File (AMDF).

i. Develop, administer, and distribute the Army packaging data microform file.

j. Monitor the Army Packaging Improvement Report Program.

k. Provide interpretation and clarification of established packaging policies/procedures to all Army activities and others responsible for preparation and shipment of Army materiel.

l. Act on request from AMC depots and Army field agencies for deviations from approved packaging applications.

m. Provide technical assistance for the packaging, labeling and transportation of hazardous materiels for all modes of shipment.

n. Conduct in-depth studies related to packaging materials, equipment and methods.

o. Act as an Army-industry point of contact for ideas, inventions, concepts, materials, etc., which will advance the science of packaging.

p. Provide representation on boards, committees, groups or liaison teams as directed or approved by AMC headquarters.

q. Provide representation and administrative support for the Army Packaging Board.

r. Provide Army-wide assistance in the packaging of Army materiel and provide regular scheduled consultant visits to AMC command, depots, Army field installations, MTMC terminals and DCASR'S.

s. Review packaging requirements in publications and regulations and recommend changes for improvements to preparing or coordinating activities.

t. Function as Army point of contact on matters related to development/implementation of the DOD Packaging Data System.

4-8. The Army Packaging Board (APB)

As shown in figure 4-1, the APB in its coordinating role with the AMC is in excellent position to become acquainted with the problems of subordinate packaging elements to the AMC thereby enabling the APB to recommend important planning, policy and guidance concerning Army packaging material. (A full discussion of the APB is contained in paragraph 4-2).

4-9. AMC Major Subordinate Commands and Research, Development, and Engineering Centers

a. Major Subordinate Commands (MSC).

(1) Armament, Munitions, and Chemical, Aviation Systems, Communications-Electronics, Missile, Tank-Automotive, and Troop Support Commands have the responsibility for exercising integrated commodity management of assigned materiels. Packaging responsibilities for their assigned materiel are:

(*a*) Develop packaging requirements for the shipment and storage of assigned materiel and include the requirements in specifications, standards, data sheets, drawings, publications and other applicable media.

(*b*) Provide packaging data to support the AMDF.

(*c*) Determine and provide degree of protection guidance in all procurement and supply transactions, consistent with AR 700-15 and AMC Supplement 1 to AR 700-15 and AR 746-1.

(*d*) Prepare and provide outloading procedures as applicable for assigned materiel.

(*e*) Perform such packaging Research, Development, Test and Evaluations (RDTE) as falls within mission responsibility.

(*f*) Provide representation to the APB.

(*g*) Exercise staff supervision over all command purchases including the packaging of these purchases.

(2) The Laboratory Command (LABCOM) manages the research and development efforts of the Army's corporate laboratories and research office. It provides advice to systems planners, project engineers, and others in need of LABCOM's scientific experience and knowledge. LABCOM is AMC's primary source of technical expertise during all phases of the Materiel Acquisition Process.

(3) The Depot System Command's (DESCOM) mission is to support the soldier in the field. It performs this mission by serving as the direct

supply link to Army units around the world, providing them with everything they need to be an effective combat force. In addition, DESCOM is responsible for maintaining, overhauling, and repairing all major Army systems, from those as large as tanks to those as small and intricate as laser range-finding units.

b. Research, Development, and Engineering Centers.

(1) The Natick Research, Development, and Engineering Center (NRDEC) provides packaging engineering support for subsistence, clothing and textiles and other items assigned by the AMC subordinate commands and other DOD components. NRDEC is also an Army custodian and DOD preparing activity for many Federal specifications on packaging materials. Subject to criteria covered by a Joint Logistics Commander's Joint Secretariat Directive, NRDEC has DOD responsibilities in the area of research, development, and engineering.

(2) The Belvoir Research, Development, and Engineering Center (BRDEC) performs research, development, test, evaluation, and engineering in the field of materials (organic coatints, metals, plastics and ceramics, radiation, biodeterioration, rubber and coated fabrics, chemistry, optics and spectrophotometrics). Serves as consultant in materials and packaging technology on assigned commodity items. Designs, develops, and maintains selected packaging specifications and standards. Determines packaging requirements and develops packaging designs for Technical Data Packages (TDP) for Army Troop Support, Aviation Systems, and Tank-Automotive Command items.

(3) The Armament Research, Development, and Engineering Center (ARDEC) performs research, development, engineering, procurement, and materiel readiness functions for conventional and nuclear weapons; ammunition (artillery, infantry, gun type air defense, surface vehicle mounted and aircraft mounted); fire control systems; Ammunition Peculiar Equipment (APE); Test, Measurement, and Diagnostic Equipment (TMDE); and tools and maintenance equipment.

4-10. Packaging and Storage

a. The AMC maintains depots which receive, store, and redistribute material to their various customers or using activities.

b. Each of these depots supports a packaging activity which has the following responsibilities:

(1) To repackage stored items as required by results of periodic surveillance inspection.

(2) To package repaired and modified items for shipment or storage.

(3) To repackage new receipts to meet the rigors of storage and redistribution when original packaging is inadequate.

(4) To package and pack outgoing shipments to customers.

c. In a typical depot organization, the packaging activity would constitute a segment under the director for supply.

(1) The packaging supervisor has responsibility for all the packaging operations.

(2) Each packaging line is supervised by a foreman or leader responsible to the supervisor.

(3) Some depots might have two packaging supervisors–one responsible for vehicles and equipment, the other for line items.

CHAPTER 5
PACKAGING WITHIN THE AIR FORCE

Section I. GENERAL PACKAGING POLICY

5-1. Implementation of DOD Instruction 4100.14

a. Air Force Regulations 71-6, Packaging of Materiel, and 71-1, Packaging Management, implement DOD Instruction 4100.14 throughout the Air Force. The latter also establishes management objectives for accomplishing the Air Force packaging mission.

b. Air Force policy affords supplies and equipment the level of packaging protection necessary to prevent deterioration or damage during handling, shipment, and storage at the lowest overall life cycle cost. The marking of items, packages, and shipping containers shall be in accordance with applicable standards, specifications, and other authorized instructions.

c. The levels of protection are as described in AFR 71-6. The application of levels of protection is based upon anticipated storage, use, destination, and mode of transportation.

5-2. Implementation of Air Force Packaging Policy

a. The policy is applicable to all major Air Force commands.

b. The Air Force Systems Command (AFSC) and the Air Force Logistics Command (AFLC) are charged with the responsibility for developing specifications and standards for preservation, packing, and marking. AFSC is responsible for developing requirements peculiar to the research and development (acquisition) stage of weapon systems before Program Management Responsibility transfer. AFLC is responsible for developing and specifying basic requirements for systems (items) in the production and operational stages of a weapon system. The Air Force Acquisition Logistics Center (AFALC) under AFLC is responsible for assuring integrated logistics support from the earliest conceptual stage to deployment and operation of a weapons system and applies "lessons learned" to new acquisitions. AFSC is also responsible for insuring timely integration of logistics considerations into system and cost effectiveness analysis and incorporating Integrated Logistics Support (ILS) requirements into contractual documents.

(1) The major air commands are instructed to communicate directly with AFSC on packaging matters relating to weapon systems research, development, test, and acquisition.

(2) The major air commands will communicate with AFLC on packaging matters relating directly to logistical support.

c. AFSC and AFLC also—

(1) Coordinate and cooperate with industry to the fullest practical extent in development and applying new packaging techniques, methods, and materials.

(2) Maintain liaison between themselves in developing packaging methods to be used by contractors which will provide the required protection of items at the lowest overall logistics cost.

5-3. Packaging Cost Reduction Guidance

a. The Systems and Logistics Commands are instructed to develop a minimum number of kinds, sizes, and types of packages and packs, and

b. To develop more economical techniques, methods, and materials for preservation and packing.

c. Packaging costs are reduced by—

(1) Using less costly materials whenever possible.

(2) Making packs multipurpose.

(3) Reducing weight and cube to conserve transportation funds.

(4) Selecting the least costly method of preservation and packing when more than one method will provide the degree of protection necessary.

(5) Selective use of packaging services contracts.

(6) Reuse of containers.

Section II. AIR FORCE PACKAGING ORGANIZATION

5-4. US Air Force Packaging Objectives

a. Packaging objectives must be in harmony with the overall logistics concept of the Air Force. That concept holds that more and more weapon systems will be supported by air. Overall Air Force objectives for packaging management are to establish and maintain a program which will ensure that Air Force items are afforded required protection at minimum costs from source to user,

consistent with deployment and operational requirements. Specific objectives to implement this program are to—

(1) Identify in the design stage those items which, because of size, weight or fragility, are potential packaging and transportability problems. Ask for redesign to eliminate problems. If not practical to redesign, consider disassembly of oversize items to permit shipment by all modes of transportation, especially air.

(2) Develop lightweight containers to reduce tare weight yet use durable materials which will permit reuse of containers readily available. Containers which meet these requirements are the Category I Air Transport Association (ATA) Specification 300 containers. These are standard size, off-the-shelf containers produced by numerous manufacturers nationwide.

(3) Develop systems of standardized, reusable packaging. Fast Pack and Standard Pack are examples of such systems. The principles followed in design are reusability, versatility, and simplicity.

(4) Broadcast packaging requirements for depot-level repair items to all AF bases through automated data systems. This is accomplished by printing a simple instruction number on DD Form 1348-1 DOD Single Line Item Release/Receipt Document.

(5) Promote recovery and reuse of packaging materials and containers. Require accountability of surplus Category 1 100-trip minimum reusable containers and recycle these in support of incoming systems.

(6) Require direct shipment of spares from subcontractors and vendors to AFLC depots on provisioning and resupply procurements. Where possible, ship direct from contractor to the AF base customer, thus bypassing the AFLC depot.

(7) Furnish reusable multiitem containers to prime contractors to use for transportation of complete sets, such as F16 radar, for installation in the weapon system. The containers are returned to subcontractors for reuse. This type of container can be economically adapted to ship other sets of items.

(8) Avoid cost of engineering development for special design containers by requiring integration of the Container Design Retrieval System using the procedures outlined in Military Standard MIL-STD-1510.

b. To assure repair cycle items entering the AF inventory are packed by the contractor in one of the standardized systems, contract Statements of Work include the requirements that preference must be given to Fast Pack and Standard Pack systems.

5-5. Headquarters, US Air Force

a. The packaging mission at Headquarters, USAF has been assigned to the Transportation Support and Services Division. It is the responsibility of this division to establish and monitor Air Force policies on packaging matters and coordinate with other Government agencies as required.

b. The implementation of established packaging requirements is the responsibility of the major commands (fig 5-1). The AFSC with its divisions and test centers, and the AFLC with its air logistics centers, the Air Force Acquisition Logistics Center (AFALC), and the Air Force Packaging Evaluation Activity (AFPEA) have the major responsibility and cooperate closely to ensure that Air Force materiel will be adequately protected until used.

5-6. Air Force Systems Command

a. The Air Force Systems Command is charged with the development, procurement, and delivery to the operational unit of new weapon systems. Contract administration is provided by the Air Force Contract Management Division for contracts assigned to the Air Force by the Services' Plant Cognizance Program. Contract administration is also performed by the Defense Logistics Agency's Defense Contract Administration Service (DCAS) through their field offices.

b. AF Contract Management Division and DCAS through their local representatives perform surveillance of contractors' packaging and materials handling operations. These organizations provide applicable AFSC and AFLC activities information and recommendations concerning the effectiveness of packaging and materials handling terms, conditions, and instructions directed to the contractor.

c. Packaging responsibility in AFSC is defined as a transportation function and assigned to the Directorate of Transportation.

d. The AFSC responsibility for packaging—

(1) Provides requirements to contractors to facilitate the development or provision of packaging and materials handling devices necessary to support the initial procurement, assembly, and delivery of systems to first point of use or test.

(2) Sets up offices physically located in or adjacent to the contractor's plant in order to perform quality acceptance of the packaging or materials handling device the contractor has been directed to develop to package systems material for delivery to the designated point of system assembly or use.

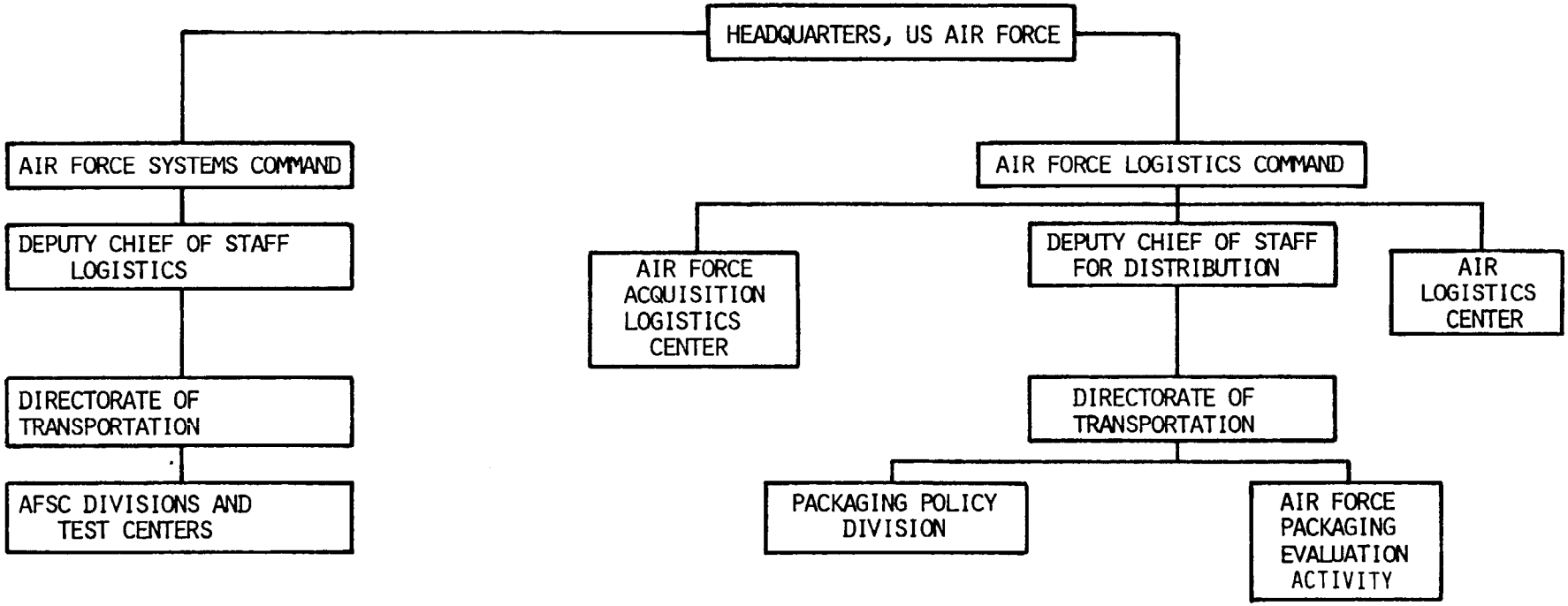


FIGURE 5-1. MAJOR ELEMENTS OF U.S. AIR FORCE PACKAGING ORGANIZATION

(3) Approves packaging for items classified as research, development, or installs. AFLC (the ALC having management responsibility) will provide or approve packaging for initial and replenishment spares/repair parts.

(4) Provides AFLC with technical data related to packaging and materials-handling devices to be utilized throughout the life cycle of a system, as required.

(5) Provides assistance regarding damage which occurs in the movement of systems as required or voluntarily when such action is warranted. Assures that the magnitude of damage being experienced by a contractor is considered in evaluating performance.

(6) Provides Certificates of Equivalency, as appropriate, for special container designs developed for shipment of hazardous items that exceed normal Department of Transportation limitations.

e. AFSC has established the Container Design Retrieval System which is a computer-based method of retrieving and reusing container designs for shipping and storage containers and container assets for new systems. Operation of this system is covered by Air Force Regulation 71-12, Obtaining, Storing and Retrieving Container Design Data, and Military Standard MIL-STD-1510, Container Design Retrieval System, Procedures for Use of.

5-7. AFSC Product Divisions and Centers

a. AFSC has established product divisions and centers to provide transportation and packaging guidance and support to program offices during the Research, Development, Test and Evaluation of all new systems, equipment and munitions.

b. Divisions and centers also—

(1) Specify packaging requirements for inclusion in AFSC procurements of new systems, equipment and munitions.

(2) Provide guidance and assistance to the program manager to assure the attainment of AFSC packaging policies and objectives for research, development, test, and AFSC production contract items. Ensure that appropriate technical direction is provided in the Program Management Document (PMD).

(3) Ensure that packaging requirements, including those provided by other major commands, are satisfied in design and development of new systems, equipment and munitions. Provide technical reviews and appropriate inputs to planning and program documentation, Required Operational Capability (ROC), PMD, and Integrated Logistics Support Plan (ILSP).

(4) Participate in design reviews, mockup inspections, and other technical assessments to ensure consideration of packaging in the design, development, test and acquisition of systems, equipment and munitions.

(5) Review and provide comments and recommendations concerning packaging requirements for research, development, test and AFSC production contract items for inclusion in specifications.

(6) Assure that packaging for hazardous items undergoing research, development, test and evaluation in AFSC production contract is in accordance with regulatory requirements, or complies with the provisions of AFLCR 800-29/AFSCR 800-29/DARCOM-R 700-103/NAVMATINST 4030.11/DLAR 4145.37, Policies and Procedures for Hazardous Materials Package Certification, for packaging that deviates from US Department of Transportation regulations.

(7) Prepare, review, revise and comment on the packaging requirements of standards and specifications.

5-8. Air Force Logistics Command

a. The mission of the Air Force Logistics Command (AFLC) is to keep the US Air Force's aerospace weapon systems, wherever deployed in the world, in a state of readiness. The command is charged with providing logistics support—maintaining aircraft, missiles, and equipment; procuring materiel, equipment and services; and managing, storing, distributing and transporting materiel. Logistics activities include four primary functions: acquisition, supply, transportation and maintenance.

b. The packaging responsibility in AFLC is assigned to the Directorate of Transportation, Deputy Chief of Staff for Distribution. Both the Packaging Policy Division and the Air Force Packaging Evaluation Activity report to the Directorate of Transportation. The Air Force Packaging Evaluation Activity (AFPEA) provides a technical engineering capability to AFLC as well as to major commands. Also under AFLC is the Air Force Acquisition Logistics Center (AFALC). The AFALC has a packaging function which examines early-phase acquisition documents to incorporate logistics packaging requirements.

(1) AFLC supports AFSC in the development of initial packaging and materials handling devices to assure compatibility with operational phase requirements. It is also the responsibility of AFLC to provide instruction to facilitate the development or provision of packaging and materials handling devices necessary in the support of acquisition, movement, and storage of spare parts and

general hardware during the operational life cycle of a system.

(2) AFLC also maintains current packaging and materials handling data files for items managed.

(3) AFLC has responsibility to provide AFSC with information, advice, and recommendations concerning the effectiveness of the packaging and materials handling accomplished by the contractors, as evidenced by evaluation of the Standard Form 364, Report of Discrepancy and other damage-control reports.

(4) AFLC develops and publishes all technical orders required in the packaging and materials handling of systems throughout the life cycle of the system.

(5) AFLC is also responsible for the Air Force Packaging Evaluation Activity (AFPEA) through the AFALC. The AFALC mission is to participate in the acquisition of aerospace systems equipment to optimize their availability, supportability, and readiness while minimizing life cycles costs. Packaging is an important function in optimizing these characteristics.

5-9. Air Logistics Centers (ALC's)

a. In fulfilling its mission of provisioning operational units, AFLC has established a network of Air Logistics Centers. The ALC's procurement responsibility includes, but is not limited to: initial spare parts, components, and Support Equipment (SE); replenishment items for weapon, support, space, command and control systems, and Aerospace Ground Equipment (AGE); nonsystem related items and items for which modification and maintenance service are performed.

b. The ALC's will store materiel until required for use, fill customer's requisitions, and perform repairs and modifications on equipment and components as required.

c. The ALC's operations include packaging lines where repaired and modified items and receipts from procurement are preserved and packed for shipment or storage, as may be required.

d. The ALC's are constantly striving to improve and simplify the packaging procedures for the items under their cognizance. An outstanding example of this effort is the Fast Pack Standardization Program, a family of standard size cushioned shipping containers consisting of four types: Vertical Star Pack, Folding Convoluted Pack, Telescoping Encapsulated Pack and Horizontal Star Pack.

(1) All use polyurethane foam cushioning which is bonded to the inner surfaces of the fiberboard shipping container to assure the integrity of the complete pack. They are especially useful for return of reparables since each size and type is suitable for shipment of a large number of different items within certain limits of size, weight, and fragility.

(2) Because of their versatility, every effort should be made to open the Fast Pack without damaging it and to save the container. The relatively small storage space required, coupled with high reuse value and low labor-time required to repack, have produced enthusiastic response to the Fast Pack program by using bases. The containers are stock listed in the General Services Administration (GSA) Supply Catalog.

(3) The Fast Pack program has also reacted to the advent of microtechnology with respect to the problems created by Electrostatic Discharge (ESD). This was accomplished by requiring the polyurethane cushioning in the Folding Convoluted Pack (Type II Slide Pack) to be anti-static. The use of the antistatic fast pack in conjunction with specialized preservation materials will also enhance the reliability of the item.

5-10. Administration

a. Packaging policy for Air Force is promulgated by HQ, USAF.

b. AFSC packaging technicians develop and update the packaging criteria and requirements for logistics support planning until Program Management Responsibility Transfer to the Participating and Support Commands.

c. AFLC packaging technicians participate with logistics support planning and logistics support requirements during all phases of systems acquisition.

d. Acquisition, storage, and distribution of spares, spare parts, and general hardware for operational units are handled by the ALC's.

CHAPTER 6
PACKAGING WITHIN THE NAVY

Section I. NAVY PACKAGING POLICIES

6-1. Department of Defense Implementation

The joint instruction, "Logistics—Packaging of Materiel", identified in the Navy as NAVSUPINST 4030.28, implements Department of Defense Instruction 4100.14. The joint instruction contains information and guidance on objectives, definitions, general policy, levels of protection and procedures for developing protection requirements, except for ammunition and explosives. The joint operating policies and procedures for ammunition packaging are contained in Chapter 10 of Department of Defense Manual 5160.65-M.

a. Scope and Applicability. The policy applies to all elements of the Department of the Navy having packaging responsibilities, relating to design, development, procurement, production, supply and maintenance.

b. Implementation. In implementing the policy, consideration is given to the following factors as applicable:

(1) Development of "preparation for delivery" requirements for inclusion in specifications, standards and other applicable documents which:

(*a*) Conform to policy objectives.

(*b*) Result in a minimum of tare weight and cube consistent with the degree of protection required.

(2) Regular review of established preparation for delivery requirements to assure their conformance to the evolving needs of the item to be protected.

(3) Development of practicable minimum number of material and process specifications, standards and other authorized instructions and their coordination with industry.

(4) Authorization to use alternate materials and methods when such alternates are considered to be in consonance with policy objectives.

(5) Development of uniform requirements utilizing a minimum of kinds, sizes and types of packs or packaging techniques.

(6) Development of data by experimental shipments which will provide needed experience for more economical techniques, methods and materials used for preservation, and packaging.

(7) Cooperation with industry to the fullest practicable extent in the development and application of preservation, and packing techniques, methods and materials.

(8) Adoption of standards developed by nationally recognized industry organizations and technical societies when such standards meet Navy requirements.

6-2. Navy Packaging Board

NAVSUPINST 4030.21 establishes and states the functions of the Navy Packaging Board.

a. Functions. The Navy Packaging Board will serve as an advisory staff and coordinating group in carrying out the packaging responsibilities of the Secretary of the Defense, the Chief of Naval Operations and the Commander, Naval Supply Systems Command. In addition, the board is responsible for—

(1) Developing recommendations concerning Department of the Navy and Department of Defense policies for the packaging of materials, supplies, and equipment.

(2) Fostering continuing contact between those commands and agencies affected by the Department of the Navy Packaging Program for the purpose of promoting uniform understanding of policies, objectives, implementing programs and logistical requirements.

(3) Reviewing industry packaging practices and new developments to the end that those practices and developments which may benefit military packaging are more rapidly brought to the attention of the members and considered for adoption within their respective commands.

(4) Providing a channel for the interchange of information on laboratory investigations, field tests, and research and development activities in the packaging field.

(5) Assuring that packaging related trends having national sociological and ecological implications are given full consideration.

b. The Navy Packaging Board coordinates with other Department of Defense components in matters of mutual interest in the packaging field. Representation from other Government agencies and departments is invited to participate in meetings as appropriate. Special guests from industry and government may be invited to attend the meetings in advisory capacity.

Section II. NAVY PACKAGING ORGANIZATION

6-3. Packing Functions of the Naval Systems Commands

a. The management objective of the Navy Packaging Program is to provide all items of naval material with adequate, efficient and economical protection during the various phases of manufacture, distribution, usage and repair. Management is centralized at the departmental level for policy formulation and technical guidance and decentralized at the Systems Command and field levels for the determination of specific packaging requirements commensurate with planned or anticipated logistical demands.

b. The Navy Packaging Organization is geared to provide effective logistical support by facilitating delivery of supplies in usable condition, protecting quality and reliability, providing markings for identification and safety, and effecting compatibility between package "designs, transportability/handling systems and the limited stowage space available in Navy ships."

c. Packaging offices of the five Naval Systems Commands, Air, Space and Naval Warfare, Sea, Facilities Engineering, and Supply, function within their respective areas of material cognizance to provide technical guidance relative to the weapons systems, special projects, hardware, software, and facilities (fig. 6-1). Determinations relative to general direction and guidance as well as to packaging matters of common application are made by the Naval Supply Systems Command in collaboration with the other Systems Commands; The Navy Packaging Board, comprising members from each Command, serves as a coordinating group.

(1) *Naval Air Systems Command (NAVAIR).* NAVAIR has packaging responsibility in all areas of Naval Aviation, including aircraft weapons, air launched armament items, aircraft components systems, support equipment, facilities, and stations.

(2) *Naval Sea Systems Command (NAVSEA).* NAVSEA performs four basic packaging functions:

(*a*) Acts as office of primary responsibility for DOD-wide standardization of packaging management control documents for use in packaging.

(*b*) Provides professional guidance to all elements of the Navy on packaging and handling ammunition and explosives.

(*c*) Ensures that packaging and handling designs and procedures are developed and used for all surface launched and underwater ammunition, including mines, torpedoes and demolition materials.

(*d*) Ensures that packaging and handling designs and procedures are developed and used for all ship equipment and parts, including machinery, electrical/electronic items and ordnance except for those items specifically assigned to NAVAIR or SPAWAR.

(3) *Space and Naval Warfare Systems Command (SPAWAR).* SPAWAR is responsible for the performance and protection of material support functions for complete shore (ground) electronics (except Marine Corps tactical), communications, and shipboard electronic equipment (less antenna systems when not an integral part of the basic equipment). SPAWAR is the single technical authority for electronic standards and compatibility.

(4) *Naval Supply Systems Command (NAVSUP).* NAVSUP has responsibility for development and promulgation of policies and methods governing supply management of naval material, including preservation, packaging, packing, and marking; administers packaging programs having Navy-wide implications, coordinates within Navy, DOD components, and with Government agencies and industries.

(5) *Naval Facilities Engineering Command (NAVFAC).* NAVFAC plans, designs, operates, and maintains installations and related facilities and equipment of the naval shore establishment, including advance bases such as yards, docks, floating cranes, amphibious equipment, fleet moorings, surface and subsurface ocean structures; public utilities; construction; transportation and weight-handling equipment. Develops packaging requirements to be in consonance with these operations.

6-4. Major Packaging Responsibilities

Attainment of the objectives is dependent upon effective discharge of packaging responsibilities. Major responsibilities are as follows:

a. Naval Supply Systems Command. The Commander, Naval Supply Systems Command, is responsible for providing supply management policies and methods (technical guidance) relative to packaging of Navy material to activities of the Navy. In the performance of this responsibility, the Commander, Naval Supply Systems Command, will draw upon the material management experience and capability of the cognizant systems commands inherent in the execution of their assigned material support mission. The Commander, Naval Supply Systems Command is also responsible for:

(1) Representing the Navy in the development of Department of Defense packaging policy and presenting the Navy position after collaboration

DEPARTMENT OF THE NAVY
PACKAGING ORGANIZATION

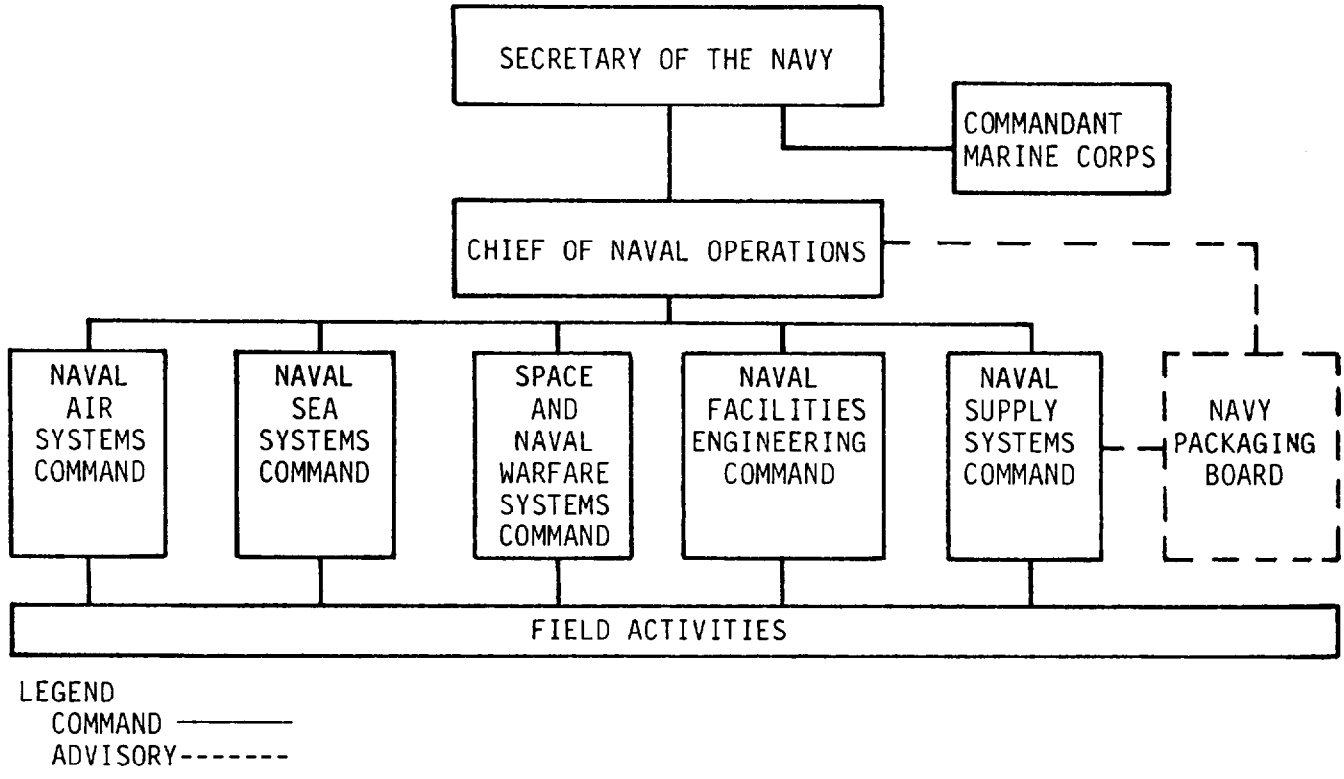


FIGURE 6-1. DEPARTMENT OF NAVY PACKAGING ORGANIZATION

with systems commands and project managers.

(2) Establishing, after coordination with systems commands and project managers, packaging policies and reviewing the implementation thereof.

(3) Maintaining appropriate liaison with the Chief of Naval Operations to assure that packaging policies are in consonance with operational and mobilization planning.

(4) Evaluating, coordinating as appropriate, and responding to industry, Secretarial and Congressional inquiries and GAO (General Accounting Office) and Audit Service reports of a general nature having Navy-wide application.

(5) Coordinating packaging programs and projects having common application within the Navy and with other DOD Components, civil agencies and industry.

(6) Providing direction and guidance to the Navy Packaging Board.

(7) Conducting a continuing review of procedures for the packaging of items being returned for repair or overhaul and initiating such implementing or corrective action as the review may indicate.

(8) Developing, in cooperation with cognizant training authorities, packaging training programs determined necessary to meet operational requirements. Developing Navy input to training doctrine and publications developed for joint service use, and advising on the technical and administrative

aspects in joint service training programs.

(9) Monitoring Navy action on packaging discrepancies and their corrections, as delineated in the Joint directive, Reporting of Item and Packaging Discrepancies (DLAR 4140.55/AR 735-11-2/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J).

(10) Sponsoring cost effectiveness studies to optimize cost of ownership of packages while fulfilling the packaging objectives.

(11) Implementing the Navy Passive Fire Protection Program as it pertains to packaging materials. This includes the selection and improvement of packaging materials to reduce the risks and hazards of fire aboard Navy ships and to improve fleet readiness by reducing losses due to fire destruction.

b. Systems Commands and Project Managers. Systems Commands and Project Managers are responsible for—

(1) Establishing packaging requirements consistent with the objectives of the Department of Defense and Navy packaging policy for each item under their technical cognizance and for implementing these requirements in procurement, Navy manufacturing operations and repackaging of material to be returned to stock. When more than one major element within the Navy is concerned with an item, minor users will adopt the requirements of the element having program management cognizance over the item unless there are compelling reasons to the contrary.

(2) Issuing such instructions as may be necessary to insure the continued integrity of the package protection initially provided during the period material is in the logistics system.

(3) Requiring maintenance of adequate packaging of stocks for which they have storage custody responsibility.

(4) Participating in the Department of Defense program for reporting and correcting packaging deficiencies.

(5) Initiating, developing and conducting such packaging training programs as may be needed to support their distributive mission.

(6) Providing support to those phases of integrated logistics support dealing with packaging, handling, storage and transportation.

(7) Requiring that adequate protection is provided to unserviceable items returned for repair.

(8) Providing, when appropriate, reusable containers and internal fitments needed for protecting repairable items during their life cycle and establishing, when appropriate, systems for control, deployment, repair and disposal of such containers and packaging materials.

(9) Conducting, or causing to be conducted, RDT&E (research, development, test, evaluation), product improvement studies, and inservice engineering efforts of methods, procedures and materials for packaging items under their technical cognizance.

(10) Evaluating, coordinating and including packaging requirements recommended by industry or other DOD components in appropriate documentation for which they have custodial responsibility.

(11) Conducting, or causing to be conducted, investigations of packaging materials, methods and equipment to determine the need for revising existing standardization documents, or initiating new documents as indicated or as assigned.

(12) Developing necessary standardization documents for packaging materials, methods and equipment, and coordinating with other DOD components, systems commands, civil agencies and industrial associations as appropriate.

(13) Initiating cost effectiveness studies to optimize cost of ownership of packages.

(14) Evaluating and responding to industry, Secretarial and Congressional inquiries and GAO and Audit Service reports on packaging matters within their assigned mission.

c. Commanders in Chief and Chief of Naval Training. The Commander in Chief, US Atlantic Fleet; Commander in Chief, US Pacific Fleet; Commander in Chief, US Naval Forces, Europe, and Chief of Naval Training are responsible for:

(1) Issuing such instructions as may be necessary to insure the continued integrity of the package protection initially provided during the period material is in the logistics system.

(2) Requiring maintenance of adequate packaging of stocks for which they have storage custody responsibility.

(3) Participating in the Department of Defense program for reporting and correcting packaging deficiencies.

(4) Initiating, developing and conducting such packaging training programs as may be needed to support their distributive mission.

(5) Requiring that adequate protection is provided to unserviceable items returned for repair.

CHAPTER 7
PACKAGING WITHIN THE MARINE CORPS

Section I. GENERAL PACKAGING POLICIES

7-1. Implementation of Department of Defense Packaging Policy

a. The Marine Corps, participating with other Department of Defense (DOD) components, implemented DOD Instruction 4100.14 with the issuance of a joint service regulation. This regulation, identified for the Marine Corps as MCO 4030.33, established uniform policies, defines and prescribes the application of military levels of protection and the use of industrial type packaging.

b. The DOD and joint service policies are supplemented as necessary by instructions issued in the 4030 series of Marine Corps directives.

7-2. Marine Corps Preservation, Packaging, and Packing (P3) Committee

MCO 5420.17 establishes and states the functions and responsibilities of the Marine Corps Packaging Committee.

Section II. PACKAGING ORGANIZATION

7-3. Packaging Management and Administration

Marine Corps programs for packaging are under the cognizance of the Deputy Chief of Staff for Installations and Logistics (DC/S I&L), Headquarter Marine Corps. Logistics Policy, Requirements, and Readiness Branch (LPP), Materiel Policy Section (LPP-2) (fig. 7-1) is the focal point for packaging and provides the DC/S I&L with staff assistance in the management and administration of packaging programs. Thus the Logistics Policy, Requirements, and Readiness Branch—

a. Participates with major DOD components in the development and implementation of Department of Defense/joint service packaging policies.

b. Develops and promulgates policies and selection/application criteria for adequate, economical life-cycle protection for all Marine Corps materiel procured, stored and issued.

c. Provides guidance to other Headquarters activities whose mission involves or interfaces with packaging and to field activities in executing their designated mission for packaging. This responsibility may be concerned with:

(1) Coordination/review of "preparation for delivery" requirements developed for inclusion in Federal and military specifications and standards and procurement documents, to ensure compliance with packaging policy objective.

(2) General surveillance over packaging facilities and operations at the various field activities.

d. Establishes and maintains necessary liaison with other DOD components, Federal Government agencies and industry.

e. Plans and conducts conferences, staff visits as deemed necessary to promote effective and efficient packaging programs.

f. Coordinates packaging innovations (and packaging improvement requests) which are of interest to more than one Marine Corps activity.

g. Provide Marine Corps membership/representation for DOD and/or joint service boards/committees/working groups, as appropriate.

h. Reviews and takes appropriate action on inquiries to use alternate/substitute materials.

i. Participates in determining and establishing packaging training programs, in cooperation with cognizant training agencies internal and external to the Marine Corps.

7-4. Packaging Responsibilities

In conjunction with the above functional management responsibilities of Code LPP and Code LPP-2, the DC/S I&L has delineated the following:

a. Commands having inventory management/materiel responsibility at the wholesale retail level.

(1) Development of adequate technical packaging requirements (specifications and standards, procurement work orders, etc.) for all items for which the command has materiel acquisition and/or stock management responsibility.

(2) Actions to ensure that adequate protection is provided at time of procurement, prior to entry of new acquisitions into the supply system.

(3) Determination of economical, realistic unit and intermediate pack quantities to be incorporated into packaging requirements cited in procurement actions and/or distributions directives.

(4) Provide for, when appropriate, the development and acquisition of reusable containers needed for the protection of reparable items during

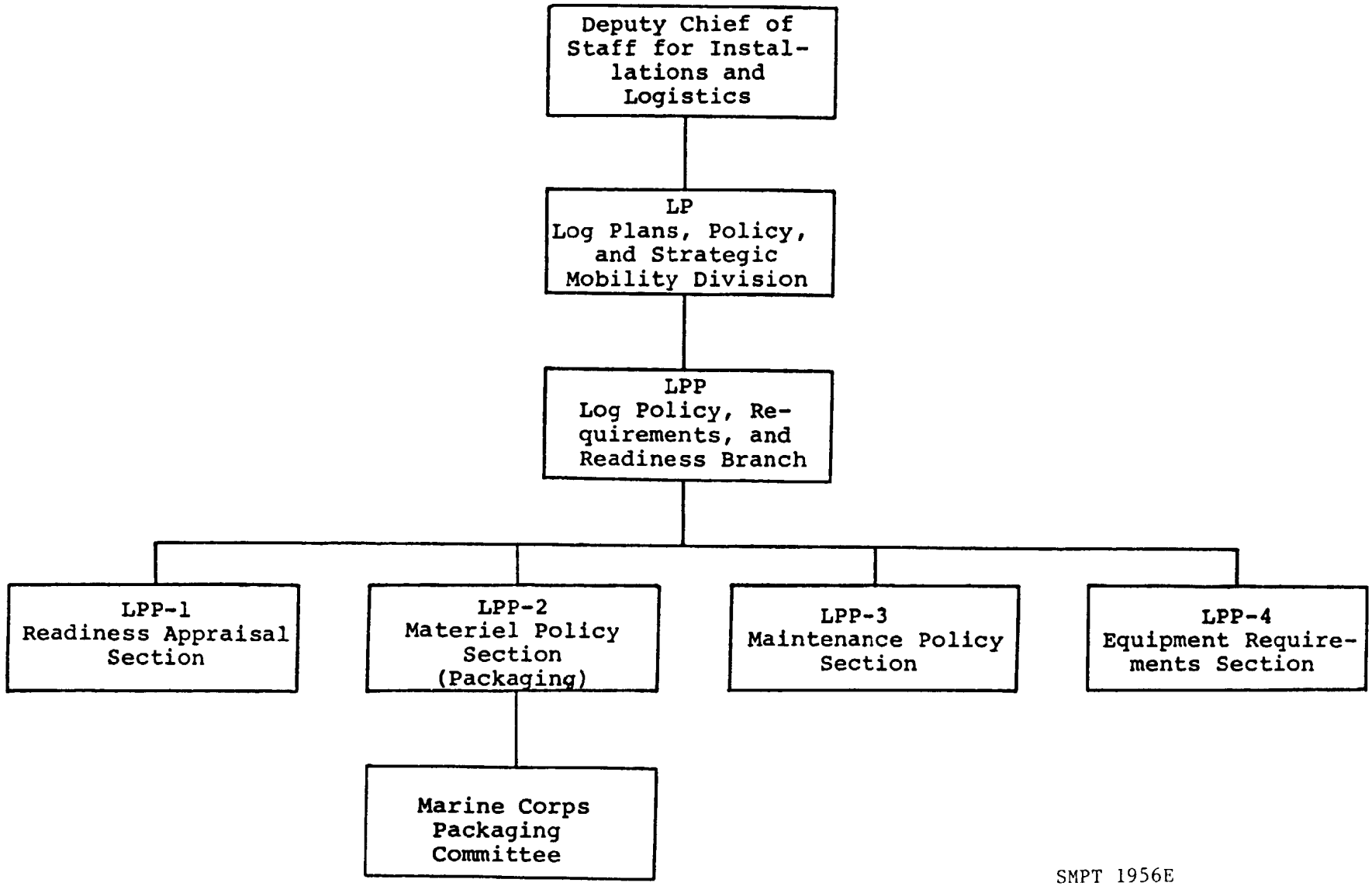


FIGURE 7-1. MARINE CORPS PACKAGING ORGANIZATION

their life-cycle and establishing, as necessary, criteria for control, utilization, repair and reutilization of such containers.

(5) Establish and maintain current technical packaging data files for items for which the agency/office has procurement or management responsibility. This packaging data may be in the form of specifications, standards, preservation data sheets, drawings, microfilm-fiche, etc.

b. Procurement activities (all echelons).

(1) Action to insure that the specified levels of preservation and packing are followed through in Invitation to Bid and/or other procurement instruments and contract administration.

(2) Obtain a breakout of packaging charges in applicable procurement documents, when such costs are significant and institute measures to evaluate the fairness and reasonableness of the commercial contractors charges for military packaging.

(3) Participate in evaluating commercial/trade practice packaging and promoting the acceptance thereof when such will satisfy the logistical requirements and is cost advantageous.

c. Storage and redistribution activities (includes quality control/quality assurance).

(1) Effective management of packaging organization and facilities that will—

(*a*) Accomplish adequate protection for materiel in need of preservation and/or packing as determined by receipt or in-store inspections and preparation for shipment. The packaging afforded should meet the specified or appropriately determined level of protection for CONUS or overseas storage and distribution and satisfy the logistical requirements for Fleet Marine Force (FMF) consignment or deployments.

(*b*) Adhere to the technical requirements of specifications, approved preservation data sheets, drawings, etc., utilizing approved methods and materials.

(*c*) Acquire/develop and maintain current packaging technical data files and assure the availability of up-to-date specifications, standards, data sheets, aperture cards, drawings, etc., either in hard copy form or on microfilm/microfiche or similar data storage and retrieval system.

(*d*) Effect consolidation/unitization of materiel for shipment in accordance with prescribed procedures and methods.

(*e*) Submit recommendations for packaging improvement as provided for by MCO P4430.3 particularly when observed packaging is inadequate or excessive to the need of an item, packed in accordance with existing specifications.

(*f*) Ensure the proper preparation of hazardous materiels, to include authorized certification that the packaging conforms to the requirements of the Department of Transportation and/or Department of Defense directives as prescribed in joint service regulation MCO P4030.19, Preparation of Hazardous Materiels for Military Air Shipment.

(*g*) Keep abreast of DOD/Government/industry trends and developments in packaging materials, methods and techniques and make recommendation to the Commandant of the Marine Corps for analysis, research, test or evaluation, as warranted.

(*h*) Report significant packaging problems that require technical resolution to the Commandant of the Marine Corps or inventory control point, as applicable, with appropriate recommendation.

(*i*) Afford minimum protection for unserviceable reparable assets awaiting repair. Such preservation should be adequate to prevent deterioration to a lower status in the interim.

(*j*) Establish an effective packaging maintenance plan which will ensure continued integrity of protection previously provided. Such plan will also provide for renewal of protection that is suspect or questionable due to aging of applied materials or circumstances of storage.

d. Fleet Marine Force and Reserve activities. Operate packaging facilities that will be adequate for the accomplishment of preservation and packing to ensure that the integrity of unit protection afforded materiel prior to shipment from supply source is maintained until materiel is placed in use. These facilities will be adequate also to upgrade the quality of original protection, when warranted and provide for necessary protection for reparable assets in retrograde movement.

e. Marine Corps air facilities and stations.

(1) Facilities and capability for packaging will be as set forth in paragraph 7-3.*a*(3), with emphasis given to the selection of materials and techniques that permit the use of lightweight containers, without sacrificing unit protection.

(2) In processing avionics peculiar spares, particular concern will be given to the high cost and critical application of such components and the protection provided will ensure long storage life and maximum utility.

(3) Keep abreast of aviation industry developments in packaging and take appropriate action to adopt these techniques when such will improve the quality, efficiency and economy of packaging Marine Corps aviation peculiar assets.

7-5. Essential External Packaging Relationships

Liaison and/or membership is maintained on various DOD joint service boards and committees concerned with DOD packaging technology, management, administration and personnel training. These include, among others—

a. Department of the Navy Packaging Board.

b. Department of the Army Packaging Board.

c. Defense Logistics Agency Packaging Board.

d. DOD Joint Packaging Coordinating Group.

e. DOD Advisory Group to the School of Military Packaging Technology.

PART THREE
RELATION OF PACKAGING TO LOGISTICS
CHAPTER 8
INTEGRATED LOGISTICS SUPPORT

8-1. General

Department of Defense Directive 4100.35 establishes policy and assigns responsibility for carrying out the integrated logistic support program as an integral part of the acquisition process for the life cycle support of systems/equipments procured by the Department of Defense.

a. Definition. Integrated logistic support is a composite of all the support considerations necessary to assure the effective and economical support of a system for its life cycle. It is an integral part of all other aspects of system acquisition and operation. Integrated logistic support is characterized by harmony and coherence among all the logistic elements. The principal elements of integrated logistic support related to the overall system life cycle include—

(1) The Maintenance Plan
(2) Support and Test Equipment
(3) Supply Support
(4) Packaging, Handling, Storage, and Transportability
(5) Technical Data
(6) Facilities
(7) Personnel and Training
(8) Logistic Support Resource Funds
(9) Logistic Support Management Information

b. General Principles and Policies

(1) Requests for Proposal or Conceptual Phase and Validation Phase efforts shall outline essential quantitative and qualitative integrated logistic support requirements. Maintenance engineering analysis paper documentation submittal to DOD components shall be delayed until the release of design drawings for Full-Scale-Development.

(2) Over the life cycle of a system, support represents a major portion of the total cost, and is sometimes the principal cost item. To achieve capability and availability on a cost effectiveness basis during the life of a system, logistic support considerations must have a meaningful relationship to design, development, test, evaluation, production and operation at all stages beginning with early conceptual studies. Therefore the following policies are established.

(*a*) Design of all operational systems, to include the characteristics of off-the-shelf subsystems and components, shall take into account the aspects of logistic support and consider them in view of available resources, under the conditions and in the environments in which the system will be used. Trade-offs appropriate to the stage of development shall be made that will maximize the effectiveness and efficiency of the support system to a degree which is in consonance with the overall system operational requirement.

(*b*) The planning, management and design of integrated logistic support shall proceed with the continuity through the life cycle of a program and shall be kept in phase with the development of the program. The level of detail in support planning, analysis and design shall be consistent with the stage of development of the program and shall include only that which is necessary and usable at that stage or required for transition to the next stage.

(*c*) The following provides for the program from the conception to operation.

1. Conceptual phase: Only a broad general plan for integrated logistic support is needed at this phase, but any special problems should be noted.

2. Validation phase: Only special problems of logistics need be addressed at this phase.

3. Full scale development: Early in the full scale development provide an integrated logistics support plan with appropriate milestones for achievement.

4. Production: The integrated logistics support plan should be fully implemented as production begins.

5. Deployment/operations: System oriented logistic support has been obtained and is functioning as an element of the total system that meets the capability requirements of the operational mission.

(*d*) The cost of planning, developing, acquiring and managing integrated logistic support resources is an inherent part of an operationally effective system. When a change to the level or schedule of the application of resources is anticipated or proposed (including funding) for integrated logistic support, the effect of such change on the system operational capability and effectiveness shall be assessed.

(*e*) The Project Manager shall develop an

appropriate Integrated Logistic Support Plan with milestones at the beginning of the Full-Scale-Development.

c. Technical Policies

(1) The operational environment and the logistic support requirements which are the result, will be addressed during the trade-off stage of the system design process. Changes to either the system or to logistic support needs will be fully evaluated for impact on the total system.

(2) Integrated logistic support planning and considerations shall employ techniques for analysis and definition of system qualitative and quantitative support values and associated costs (annual and life cycle) in funds and other resources, during the acquisition and operational phases.

(3) Each system program shall include a plan with milestones for verifying the logistic support at each key decision point (Conceptual Phase—Validation Phase—Full Scale Development—Production) using functional and environmental tests and analyses to assess whether the logistic support system designed or produced will maintain the system effectively and economically.

(4) The magnitude, scope and level of detail of the integrated logistic support analysis and design effort shall be tailored to each system. The program essentials that will always be required are analysis and definition of quantitative and qualitative logistic support requirements, prediction of logistic support costs in funds and other resources, evaluations and trade-offs. The factors listed below shall be evaluated with respect to the logistic support requirements.

(*a*) Intended use (experimental or operational).

(*b*) Quantity and complexity.

(*c*) Initial Operational Capability (IOC) date and anticipated life cycle.

(*d*) Estimated annual and life cycle costs.

(*e*) Availability and existing resources and means of correcting deficiencies.

d. Management policies

(1) A complete system approach shall be used for planning, analyzing, designing and managing the incorporation of logistic support into the acquisition of systems. These operations shall be identified and the responsibility assigned within each organizational entity involved in the acquisition process.

(2) Before logistic tasks (including requirements for reports, and technical and management information) required to be performed by the DOD Components or contractors are established, they shall be scrutinized to assure that the task or data are absolutely necessary for the efficient accomplishment of the phase of the acquisition for which they are designed. Logistic support data shall be identified, validated and scheduled for delivery in time to meet its intended use.

(3) It is the policy of the Department of Defense to encourage innovation, inventiveness and exercise of technical and managerial judgment in designing and producing systems and their logistic support to meet operational requirements, with due consideration to the limitations that must be imposed because of the availability or nonavailability of resources, operational environments, and military mission. Contractor performance in carrying out the logistic support approach shall be a major factor in the evaluation of this performance of the contract as a whole.

(4) Logistic support managers who have been broadly trained in the performance of logistic management functions and have a knowledge of engineering, design, development, procurement processes and operational needs shall be assigned to support acquisition programs/projects.

e. Principles of Integrated Logistic Support

(1) Requirements for integrated logistic support shall be included in systems or equipment development studies, plans, specifications, requests for proposals and contracts.

(2) Preparation of integrated logistic support plans shall be accomplished concurrently with development of plans for development, test and evaluation, and procurement.

(3) Integrated logistic support shall be based upon a documented engineering analysis of maintenance and operational requirements inherent in the equipment design and the plan for use.

(4) Requirements for integrated logistic support shall be "tailored" to fit the system or equipment to which applied.

(5) Systems and cost analysis organizations and programs shall support and apply the policies and principles of this Instruction.

(6) Integrated logistic support programs shall include maintainability requirements and utilize reliability program inputs.

(7) Test and evaluation programs shall concurrently test and evaluate the configuration, integration, performance and effectiveness of the integrated logistic support resources provided to support the systems or equipment under test.

(8) The integrated logistic support program shall produce basic computer library file inputs and information i.e., configuration accounting, readiness reporting, inventory management, maintenance data collection, performance analysis and cost accounting.

(9) Management information systems shall provide data to monitor the performance of the integrated logistic support system and provide data to generate refinements and improvements.

(10) Responsibility for integrating the logistic support of each system or equipment shall be assigned to a specifically designated individual.

(11) Packaging, handling, storage & transportability (PHST) 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. MIL-STD-1367, Packaging, Handling, Storage, and Transportability Program Requirements (For Systems and Equipments) establishes uniform management requirements for a PHST program. It is the basis for preparing specifications, work statements, or other documents affecting PHST. A PHST program will be established and maintained that is consistent with the type and complexity of the system/equipment being procured.

CHAPTER 9
ACQUISITION

Section I. ACQUISITION OF PACKAGING

9-1. General

The joint implementation of Department of Defense Instruction 4100.14 and the Federal Acquisition Regulation (FAR) emphasizes that appropriate preservation, packing and marking requirements must be included in procurement documents.

a. Policy. Policy documents provide that all military materiel be given adequate preservation, packing, and markings at the time of procurement, so far as practicable, to preclude costly reprocessing during the distribution process.

(1) Use of levels of protection higher than necessary will be avoided in the interest of economy.

(2) Acquisition of supplies protected at levels lower than ultimately needed results in only temporary savings. This practice is generally more expensive in total cost to the logistic system and can impair its ability to meet emergencies.

b. Statement of Requirements. These requirements will be stated clearly and in sufficient detail to obtain adequate protection and marking of supplies and equipment.

(1) Packaging requirements prescribed in contracts and specifications or used for packaging operations in military installations will be those which provide item protection at the least overall cost to the Government. Excessive weight and cubic volume will be avoided.

(2) Sufficient information, as to the type of shipment, handling, and storage conditions to be encountered to insure that economical and adequate levels of protection are indicated in requests for acquisition and in acquisition documents, must be provided the packaging component of the activity responsible for managing the item.

(3) In case of a national emergency requiring partial or full mobilization to support combat operations overseas, materiel subject to damage or deterioration in shipment, storage, or handling, and which may be used in oversea operations, will be afforded preservation and packing necessary for oversea shipment.

9-2. Packaging Requirements

a. Sources of Information. MIL-P-116 (Preservation, Methods of) establishes the basic concepts of military preservation and packing and sets forth material requirements and procedures necessary to adequately protect military materiel. Detailed packaging requirements are provided in section 5 of the commodity or product specifications, in Special Packaging Instructions (SPI's), in packaging data sheets, or other technical instructions prepared by the activity having item management responsibility.

(1) Activities which use coded data in acquisition are required to use the codes (in the position and sequence specified) which are listed in MIL-STD-2073-2, Packaging Requirement Codes. The contents and application of this document are more fully discussed in chapter 16.

(2) Other activities may use the MIL-STD-2073-2 codes (without deviation) or may express their packaging requirements in the clear, by reference to a specification, or by including in the acquisition document a Special Packaging Instruction, or other technical data sufficient to furnish the bidder and/or contractor the pertinent, detailed information necessary to insure adequate protection to the item or equipment until delivered to the ultimate consumer.

(3) Basic information on military packaging requirements and techniques is found in two publications—Packaging of Materiel-Preservation (Volume I) and Packaging of Materiel-Packing (Volume II). Respective designations are TM 38-230-I/DLAM 4145.2, Vol. I/NAVSUP Pub 502, Rev. Vol. I/AFP 71-15, Vol. I/MCO P4030.31C and DLAM 4145.2, Vol II/TM 38-230-2/NAVSUP Pub 503, Vol. II/AFP 71-16/MCO P4030.21C.

b. Responsibility. The packaging component of the service or acquisition activity having management responsibility for an item has the responsibility for determining and stipulating packaging requirements. The contracting officer is responsible for the contents of all procurement documents, such as invitations for bid, purchase orders, and contracts. The contracting officer must be certain that these documents conform to military policy and are legally sufficient. The contractor is also responsible for protecting the interests of the Government and for the inclusion of incentive clauses and value engineering clauses in contracts, when authorized by the Federal Acquisition Regulation (FAR) so that total acquisition cost may be reduced.

(1) The use of these clauses in contracts is especially effective in reducing production costs as

they offer additional profits to the contractor who produces acceptable material more efficiently and is able to engender lower production and material cost.

(2) They have a particular application to packaging where the cost of production has in many cases been changed to overhead instead of being identified as a separate cost. In the development and modification of many items, the packaging originally prescribed for the prototype is often carried over into subsequent models, although the item characteristics may have been changed drastically, and the item has been made rugged and more corrosion-resistant.

c. Basic Packaging Requirements.

(1) MIL-P-116 (Preservation, Methods of) sets forth all basic concepts of preservation (by type of protection required) for all items in the military supply system, along with various performance tests and visual examinations to insure that accepted packages meet established requirements.

(*a*) This is a *general* specification which is referenced in all packaging specifications, in other authorized documents in invitations for bid, and in contracts.

(*b*) The preparing activity is the Naval Air Systems Command (NAVAIR) Department of the Navy.

(2) It must always be kept in mind that the function of the package is to protect the item and that in developing packaging requirements, the item must be the primary consideration. In keeping with this thinking, MIL-P-116 first prescribes the operations to be performed on the item and then develops the combinations of barrier materials and containers required to maintain the item in combat-ready condition.

(*a*) MIL-P-116 first sets forth the basic requirements for cleanliness of the item and describes fourteen approved cleaning processes, one of which is a general process.

(*b*) Next, five approved drying procedures are described with their limitations and restrictions.

(*c*) The document sets up criteria by which to determine if an item will require a contact preservative of a temporary nature and contains a table listing the approved preservatives (P-type) with their characteristics and specification symbols.

(*d*) Basic requirements for the use of packaging materials are specified.

1. Any cushioning, dunnage, or barrier material in direct contact with a bare metal surface must be noncorrosive and as dry as practicable.

2. Any barrier material in direct contact with a surface coated with an oily or greasy preservative must be greaseproof and noncorrosive.

(*e*) There are six basic methods of protection defined, ranging from physical and mechanical protection only to a highly water-vaporproof method.

1. Each of these basic methods embodies within it the physical and mechanical protection required by the item plus various modifications to make the package waterproof and water-vaporproof, as required.

2. Four of these basic methods are divided into submethods which describe various combinations of barriers or containers or both which are designed to afford the protection required by the concept of the basic method.

(*f*) These six basic methods and the allied submethods are described as follows:

1. Method I, which affords waterproof protection by the use of a contact preservative.

2. Method IA, which affords water-vaporproof protection through the use of water-vaporproof barriers, containers, or combination of these materials. There are seven submethods utilizing these various inclosures for the item.

3. Method IB, which gives water-vaporproof protection by the use of a strippable plastic coating applied by a hot or "cold" dip. There are two submethods—In one, the item is dipped directly into the plastic; in the other, the item is first wrapped in aluminum foil to prevent the plastic dip from entering any blind holes, cavities, or undercuts in the item.

4. Method IC, which affords waterproof protection by the use of various barrier materials and containers. There are seven submethods, each of which employs a different barrier or container to achieve the required waterproof protection.

5. Method II, which gives highly water-vaporproof protection to critical or corrosion sensitive surfaces by the addition of a desiccant or drying agent within the package. There are six submethods, which are identical with six of the IA submethods, with the addition of desiccant and a humidity indicator to show the relative humidity within the package.

6. Method III, which affords physical and mechanical protection only. Although there are no submethods, Method III unit packs may vary from a simple tag or envelope to a carton or box with interior dunnage or devices designed to provide needed protection from shock in handling.

(*g*) The item within the package will be identified by marking the package in accordance

with MIL-STD-129 or in accordance with other requirements as prescribed.

(*h*) There are various tests prescribed for the packages, which, in effect, test the efficiency of the barrier materials, cushioning, containers, and closures (fig 9-1).

(*i*) Many visual examinations are also required to determine compliance with the packaging and marking requirements.

(*j*) MIL-P-116 also specifies the level of inspection to be performed on the various processes and on the finished package and sets the acceptable quality level (AQL) for each of the groups of tests and examinations.

(3) Because MIL-P-116 has such a wide impact, it is under constant study. Amendments and revisions, after careful scrutiny and coordination, are effected to keep the document current with the needs of the services.

d. Packaging Material Requirements.

(1) The packaging engineer or technician, when selecting packaging materials, may look for many characteristics, either individually or in combination, so that the completed package will afford the required protection to the item.

(2) Packaging materials may be classified and their requirements listed as follows:

(*a*) Cleaning materials, which include solvents, both chlorinated and petroleum-based, alcohols, acids, alkalies, detergents, emulsified cleansers, abrasives, impact tools, and water.

1. The basic requirement for these materials is that they be in themselves clean and free from contamination.

2. They must be capable of removing all corrosion-causing contaminants from the items.

3. In the case of strong chemical cleaners, such as acids and alkalies, there must be built-in controls, or inhibitors, to limit the attack of such cleaners on the base metal.

(*b*) Preservative materials, which include permanent preservatives for metals, such as plating and chemical coatings, preservatives for nonmetals, such as leather dressing and wood preservatives, and temporary preservatives for metals, such as greases, oils, and volatile corrosion inhibitors.

1. The basic requirements for preservative materials are that they be capable of protecting the underlying material from environmental attack, and that they be compatible with it.

2. Permanent preservative coatings for metal items must be properly applied and must be of sufficient thickness and hardness to meet design requirements.

3. Preservatives for nonmetals must be compatible with the item, must not stain or discolor the material, and, if possible should be nontoxic and nonirritating.

4. The temporary preservatives for metals should be relatively easy to apply and remove, should give protection over the required period of time, should be capable of being applied in a continuous unbroken coating, and should retain their characteristics over a wide temperature range.

(*c*) Wraps, cushioning materials, and dunnage are materials that include the intimate wraps for the items, cushioning, shock-mitigation devices, shielding wraps for magnetic devices, and various containers that are used as dunnage within the barriers that constitute the unit package.

1. Characteristics, such as absence of corrosivity, waterproofness, greaseproofness, moldability, tear strength, and puncture resistance, are important in the wraps which come into intimate contact with the surface of an item.

2. Cushioning materials are tested for resilience, compression set, rate of recovery, tensile strength, abrasiveness, liquid absorbency, resistance to attack by fungus, insects, and rodents, pH factor (noncorrosiveness), constancy of characteristics in extreme temperature and humidity conditions, insulation values, moldability, and diecutting or preforming adaptability.

3. Shock mitigation devices must have acceptable mounting accommodations, vibration damping, and elasticity characteristics. Size and weight must be within predetermined limits and, if they are to be used outside the pack, as in open freight car loading, must be corrosion resistant.

4. Shielding wraps for magnetic devices must be capable of limiting the external electromagnetic forces below predetermined limits. Unrestricted electromagnetic fields can cause errors in magnetic compass reading and can damage other cargo sensitive to electromagnetic fields.

5. Containers used as dunnage must be capable of carrying the load, meet requirements as to dry and wet bursting strength, be puncture-resistant, and should be filled and closed with a minimum of labor.

(*d*) Barrier materials include waterproof and water-vaporproof wraps, plastic coatings, and waxes.

1. Requirements for these materials include determination of moisture-vapor transmission rates, heat sealability, shelf life, tank life, application temperatures, tear strength, puncture resistance, and cushioning qualities.

2. As their nomenclature indicates, these

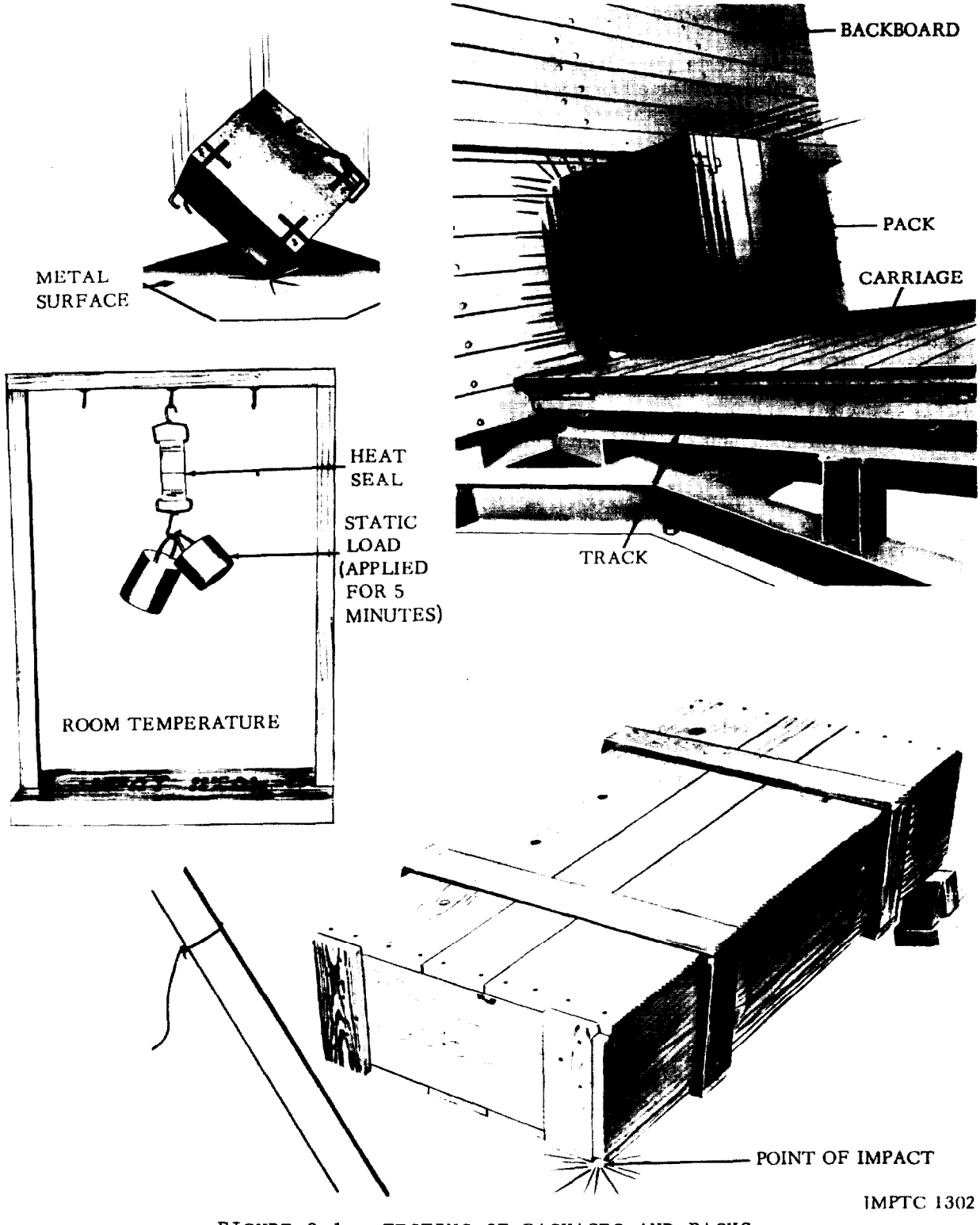


FIGURE 9-1. TESTING OF PACKAGES AND PACKS

barrier materials actually furnish the required quality of protection to the item. Close adherence to their specified characteristics is required.

(*e*) Containers used in unit packs and exterior packing range in size from the small paperboard, set-up or folding boxes, similar to pillboxes, to specially engineered vans and trailers which have built-in shock-mitigating devices and environmental controls.

1. Strength of material, fabrication meth-

ods, reliability, reusability, and cost are some of the factors that must be considered.

2. Since it is the container that furnishes most of the physical and mechanical protection to the contents, it must be designed to withstand normal anticipated hazards of transport and storage.

(*f*) Closure devices include tapes, flat and round steel strapping, nonmetallic strapping, heat-sealing machines, gaskets, adhesives, staples, twine, rope, bolts, locking rings, nails, clips, and screws.

1. For most of these devices, tensile strength is of prime importance. Metallic fasteners should be corrosion-resistant; nails and screws must have sufficient holding power to perform satisfactorily; and tapes and adhesives must meet minimum adhesion requirements.

2. Heat-sealing machines and other mechanical-closing machines must make the closure so that it will pass all the required tests and inspections.

(3) The requirements for packaging and packing materials are so many and varied that it is evident that every aspect of the problem of protecting and maintaining the item has been considered in these material specifications.

Section II. THE FUNCTION OF THE PACKAGING SPECIALIST IN ACQUISITION

9-3. General

a. The function of the packaging specialist is basically the same in military departments and civilian agencies of the Government. Duties may be performed in quality assurance, transportation, acquisition, storage, or any other of the logistic support areas. The mission in part is interpreting policy, monitoring requirements and performance, and analyzing packaging costs to assure adequate packaging at minimum cost for safe delivery of the materiel to the ultimate consumer.

b. The way in which the packaging specialist functions may vary between civilian agencies or even between divisions within each department or agency, depending on the requirements of the service and how the specialist's function fits into the overall mission.

9-4. Responsibilities of the Packaging Specialist

a. Preparation of Packaging Data for Acquisition Documents. Defense policy requires that pertinent, detailed packaging requirements be included in all acquisition documents. It is the responsibility of the packaging specialist to prepare this data, to review previously prepared packaging requirements, and to institute such changes as may be dictated by current policy or by newer materials and techniques which would result in adequate protection at minimum overall cost.

(1) In reviewing existing packaging data, the packaging specialist must be aware of technological improvements made to the equipment which would have an effect on the amount or kind of preservation required to protect the item from shipping, handling, and storage hazards.

(2) The packaging specialist must apply the parameter of potential cost to every preservation and packing prescription and include in the requirements only those methods, materials, and containers which will provide the required degree of protection at minimum cost.

(3) The packaging requirements are coordinated with the technical personnel having knowledge of the item, and with transportation, storage, and other elements of the supply system to insure compatibility with their capabilities.

b. Assistance in Contract Negotiations. The packaging specialist, as a member of the contracting officer's team, may be called on to furnish packaging cost estimates in support of the Government negotiator. The packaging specialist has several sources from which to draw the information to base his estimate. Among these are—

(1) *Indefinite delivery-type packaging service contracts.* Some activities have entered into indefinite delivery-type (open-end) contracts with commercial packaging contractors as a packaging cost reduction measure and also to have a source of packaging capability available when needed. These contracts are available to the packaging specialist, and the packaging costs derived from them furnish an excellent yardstick for measuring the acceptability of offers made during negotiation.

(2) *Knowledge gained through experience.* Many packaging specialists, applying the knowledge they have gained through years of experience in this field, can improve the accuracy of the cost estimates derived from documentary sources.

c. Preaward Surveys. Prior to the award of a contract, the contracting officer may determine that a survey of the prospective contractor's plant facilities, capabilities, and skills be made to determine if the contractor is capable of meeting the requirements imposed by the contract and making satisfactory, timely delivery of the material or equipment ordered. Since this function is a normal Contract Administration Services (CAS) function, the survey will be requested of the cognizant Defense Contract Administration Services (DCAS)

component.

d. Knowledge and Background Required. Because of the complexity of the job, the packaging specialist working in acquisition must have a thorough knowledge of preservation and packing materials and techniques, of shipping and storage conditions and requirements, and of the capability and limitations of material-handling devices and automated material-handling systems.

(1) The packaging specialist must keep abreast of new developments in materials and techniques and should be alert to suggest their adoption whenever they are suitable for military use, if adoption will result in cost reduction.

(2) The packing specialist also must be kept informed or made aware of technological changes in military material and equipment in order to institute changes in packaging requirements as indicated by the characteristics of the modified items.

(3) The packaging specialist must keep current in the knowledge of content and interpretation of policy documents as they affect packaging, and implement packaging prescriptions within the guidelines as applicable.

(4) The packaging specialist must be constantly aware of the cost factor in packaging and be receptive at all times to suggestions and recommendations from DCAS packaging specialists for changes which will provide required protection at less cost.

Section III. PACKAGING COST ANALYSIS

9-5. Packaging Cost Factors

a. Packaging costs are very often considered as part of the general overhead.

b. In the past few years, however, due to the general interest in all basic costs, there have been many successful attempts made to segregate packaging costs from general overhead.

c. The costs more commonly assigned to the packaging function (fig 9-2) are—

(1) The cost of packaging materials—

(*a*) Packaging materials include cleaning and drying materials, preservatives, wraps, barriers, cushioning, containers, labels, tags, and container closures, such as tape, adhesive, and steel strapping.

(*b*) In addition to the cost of the material itself, these costs include the cost of procuring, storing, controlling, moving, protecting, and assuring the quality of these materials, plus the cost of financing the inventory and the factor of disposal of scrap and surpluses.

(2) The cost of designing packaging—

(*a*) In most cases, the military, through specifications and standards, has relieved the contractor of this cost.

(*b*) This includes, where applicable, the costs of the planners, the designers, and the technicians, the clerks, and the supplies and equipment necessary to develop, test, and prove the packaging.

(c) In all cases, even though the packaging requirements have been furnished, the cost of testing and proving the packaging must be included.

(3) The costs of the packaging line includes the cost of labor, tools, amortized capital equipment, maintenance, space, utilities, production controls, and industrial engineering.

(4) The cost of damage includes not only the loss of the goods, but also the failure analysis and redesign costs.

(5) The costs of administrative services, including training, research, specification and contract review and negotiation, and the cost of maintaining a technical library.

9-6. Industry Interest in Packaging Costs

a. Industry is constantly examining packaging costs, especially in those areas where competition is keen and the award or loss of a contract may hinge on a few mils of excessive cost in one operation.

b. The cost of industrial packaging, as one of the major costs in the commodity price, is under constant review.

c. As the interest of the military in packaging costs increases, industry has been paying much closer attention to these (i.e., military) packaging costs.

9-7. Military Interest in Packaging Costs

a. In order to support budgetary requirements the military must supply Congress with exact cost in every facet of its operations, including packaging.

b. To keep within its budget, each service must monitor its expenditures as they occur and must accurately forecast future expenditures.

9-8. Preservation and Packing Cost Reduction

a. This area encompasses management improvements associated with the application or use of

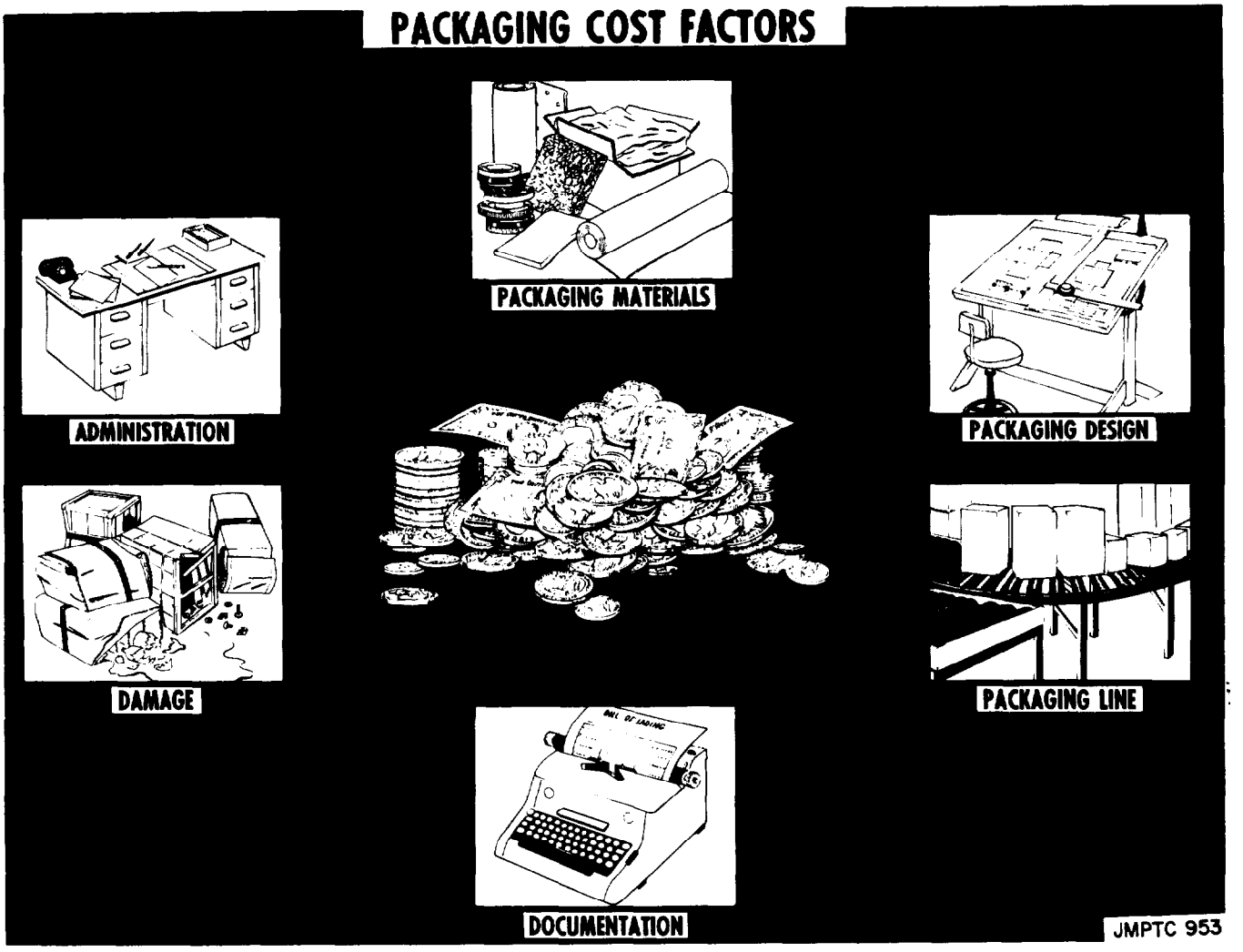


Figure 9-2. Packaging Cost Factors

preservation, packing, and marking materials, and techniques to protect equipment and supplies during shipment, handling, and storage.

b. The following definitions apply to this area:

(1) *Preservation.* Application of protective measures, including cleaning, drying, preservative materials, barrier materials, cushioning, and containers when necessary.

(2) *Packing.* Assembling of items into a unit, intermediate, or exterior pack with necessary blocking, bracing, cushioning, weatherproofing, reinforcement, and marking.

(3) *Packaging.* The processes and procedures used to protect materiel from deterioration and/or damage. It includes cleaning, drying, preserving, packing, marking, and unitization. This is a comprehensive term which includes (1) and (2) above.

(4) *Packaging cost reduction.* The cost differential between the before management action cost and the after management action cost.

(5) *Tare weight.* The difference between the bare item weight, prior to packing and the gross weight of the packed item.

c. Packaging costs include—

(1) *Under contract operation.* The cost of labor and materials (including all applicable overhead charges, burden rates, and profit) required to package an item or group of items for shipment or storage. When the package includes reusable containers furnished by the shipper, the cost of the reusable components shall be considered to be their initial cost divided by the average number of reuses. In acquisition, packaging costs may be identified by individual line items or as a percentage of item cost which applies to a portion or all of the contract.

(2) *In-house operations.* The cost of labor and materials required to package and pack an item, or group of items, for shipment or storage.

d. Packaging cost includes cost of transporting the tare weight of the shipment at the rate which applies to the packaged item.

e. Actions based on an unwarranted level of protection at the expense of other elements of the distribution system will not qualify for reporting as cost reductions.

f. Realized and estimated savings to be reported in this area are those which result from the following, provided that the management action is within the current year:

(1) More realistic requirements for use of preservation and packing material.

(2) Changes in packaging methods, production practices, or packaging materials.

(3) Increased operating efficiency at the administrative or production level.

(4) More accurate or realistic determination of packaging charges.

(5) Other actions which allow a reduction in packaging costs.

g. Packaging cost reductions may result from actions by either the Government, including Government production facilities, or a qualifying contractor. Cost reduction may affect, or be affected by, operations at any stage from production design through provisioning, contractor delivery, distribution, and return shipment as retrograde material.

h. Packaging cost reductions may involve—

(1) Acquisition funds, when the packaging is performed by a contractor or Government production facility as part of the contract price.

(2) Operation and maintenance funds of supply depots, when the packaging is performed at a military depot operation.

(3) Transportation funds, when costs are reduced due to reductions in tare weight and/or cube of the packaged item.

i. Packaging cost reductions resulting from value engineering efforts will not be included in this area.

j. Cost reduction actions which should be reported but are not limited to the following:

(1) Making the item more rugged to reduce the amount of packaging needed to protect it through the distribution system.

(2) Reducing requirements for a costly material by substituting a less costly material, while still providing adequate protection.

(3) Packaging cost reduction resulting from review and renegotiation with the contractor.

(4) Management efforts which result in the reduction of manpower.

k. Measurement of savings are described in (1) through (4) below.

(1) Savings may be realized from new, improved or intensified actions implemented in any phase of the operation as stated in *g* above.

(2) Savings will be determined by making cost comparisons on an individual management improvement basis.

(3) The effect of transportation costs must also be considered in determining savings. If transportation costs are reduced as a result of improvements in preservation or packing, these savings are also reportable. When transportation costs increase as a result of the reported improvement, these costs represent an offset cost.

(4) The "before" and "after" costs used in cost comparisons should be supportable from existing official records, documentation, and data which include, but are not limited to, cost records, accounting records, payroll records, contracts, contractual change documents, performance and engineering standards, flight data, and performance test data.

9-9. Packaging Cost Control Programs

There are packaging cost control programs in operation which are effective in keeping packaging costs fair and reasonable. The indefinite type packaging service contract can be used as a yardstick with which to measure proposed packaging charges.

(1) In all acquisitions involving packaging where the proposed packaging expenditure exceeds a predetermined minimum figure, the bidder is required to submit two prices for packaging: One for industrial packaging and one for the required military package.

(2) The price for the military packaging is compared with the prices in the packaging service contract, adjustments are made to allow for additional transportation costs and service charges against the contract and, if the bidder's price is higher than the adjusted charge, it is recommended that the packaging be diverted from the bidder.

(3) The contracting officer will consider this recommendation, along with other logistic requirements and, if feasible, procure the item industrially packaged and have it repackaged to the required level by the packaging service contractor.

b. Several services/agencies have adopted programs of this type. The contractor's services are available to any government agency desiring to make use of them.

Section IV. CONTRACTING FOR PACKAGING SERVICE

9-10. General

a. It is often necessary for military activities and prime contractors to enter into contracts with packaging service contractors. There are several factors involved in deciding whether to perform the packaging "in-house" or have it done by a contractor.

(1) It is the policy of the Government that Government activities will not engage in any enterprise that is directly competitive with private industry, unless there are particular reasons, such as security or immediate need, that make it expedient to do so.

(2) Some contractors find that the cost of setting up a special packaging line to meet military requirements is so great that the packaging charges would be prohibitive. By subcontracting the packaging to a packaging service contractor, they can put themselves in a competitive position.

(3) Qualified packaging service contractors have the capability of meeting military packaging requirements, have reliable sources of supply of specified packaging materials, and employ personnel trained in the requirements and techniques necessary to satisfactorily perform on a military contract.

(4) Even though the prime contractor may have facilities, capability and personnel qualified to do the required military packaging, the volume of business may be so large that it becomes expedient to subcontract all or a portion of the military packaging.

b. Some military activities enter into contracts with packaging service houses to set up a yardstick with which they can measure packaging charges and also to have a ready source of packaging capability when needed.

9-11. Types of Contracts

a. Although most any type of contract may be used, the indefinite delivery-type contract, awarded on a competitive basis, is the preferred type and is most widely used.

(1) This type of contract provides for the furnishing of an indefinite quantity, within stated limits, of specific services during a specified contract period.

(2) The underlying purpose of the indefinite delivery-type contract is economy.

(3) In the packaging operation, they make maximum use of the contractor's facilities for direct shipment to the actual consumer.

(4) A cost saving is realized in inventory control, rotation of stock, and handling of packaging materials.

(5) A further saving is possible in the freeing of the Government or the prime contractor from losses resulting form obsolescence, pilferage, and misplacement of stocks.

b. This type of contract is awarded after an advertised invitation for bid so that all interested parties have an opportunity to study the requirements and submit quotations.

c. Under particular conditions explained fully in the Federal Acquisition Regulation (FAR) contracts can be negotiated by issuing a request for proposals to a selected list of bidders.

(1) Competition is assured by requesting proposals from several bidders.

(2) A cost breakdown is required in each proposal.

(3) Negotiations for the best possible price are then carried on with the bidders whose proposals are closest to what we want.

d. Prime contractors are required to follow essentially these same procedures prior to awarding subcontracts. This is as applicable to packaging as to other work that is subcontracted.

CHAPTER 10
CONTRACT ADMINISTRATION

Section I. PACKAGING SPECIALIST'S RESPONSIBILITIES IN CONTRACT ADMINISTRATION

10-1. The Packaging Specialist.

a. Packaging specialists will participate in preaward surveys of prospective contractors to determine the firm's capability to provide the packaging services as required. Because of the broad scope and depth of packaging and materials handling requirements which are placed on a contractor by the commonly cited packaging specifications and standards, a firm's capability must not be taken for granted. Much of the loss and damage incurred by material arriving at oversea bases could have been prevented if the prospective contractor's knowledge and understanding of military packaging had been given the proper technical evaluation during the preaward survey and necessary action taken to assure the technical accuracy of the prospective contractor's package engineering design and performance capabilities. When preproduction tests of package engineering design are required to be performed by the contractor, procedures should be in effect for submission of the required design data for approval by the cognizant packaging control activity, as required by the referenced specifications.

b. The technical evaluation of the prospective contractor's packaging capabilities and facilities should include the following elements:

(1) Technical knowledge and experience in military packaging, both general and specific to the commodity groups involved in the proposal.

(2) Training of key personnel in military packaging.

(3) Availability of all current federal and military packaging specifications applicable to the proposal.

(4) Evidence of knowledge and/or experience in package engineering, design, test, application, evaluation, documentation, performance, and improvement, as appropriate for the scope and depth of packaging services required by the proposal.

(5) Availability and functional effectiveness of equipment, facilities and procedures for packaging and material handling as required.

(6) When packaging services are to be subcontracted, what procedures are effected for liaison to assure that the packaging firm performs necessary planning and scheduling, both in the preproduction as well as production phases and has timely access to the information needed from the prime contractor? What procedures will be followed when packaging changes are proposed by the subcontractor for approval by the procuring activity?

c. Following the preaward survey, a report will be prepared by the packaging specialist as required by the preaward survey monitor. Information which reflects the need for postaward contractor orientation should the prospective contractor receive the award will be noted in the report for use in contractor orientation, as appropriate. The packaging specialist's evaluation will provide support for all items on the Pre-Award Survey Report (DD Form 1524) which pertains to the packaging and material aspects.

10-2. Contract Review

a. The Federal Acquisition Regulation (FAR) Part 42.5 states the policy, procedures, and responsibilities for postaward orientation of contractors. Arrangements will be made to assure review by DCAS Packaging Specialists of all contracts, purchase orders, subcontracts, pertinent changes, and shipping instructions to determine the need for further actions.

b. When the contractor does not or may not have a clear understanding of the scope of the contract, the technical requirements, it is essential that the Government initiate postaward orientation action to clarify contract requirements and resolve misunderstanding.

c. Several factors listed in FAR Part 42.502 have a relationship to packaging/materials handling:

(1) Preaward survey.

(2) Technical complexity of the packaging service.

(3) Urgency of delivery schedule.

(4) Past performance.

(5) Provisioning requirements (packaging aspects).

(6) Contractor's experience in military packaging.

(7) Extent of subcontracting (packaging).

(8) Hazardous materials.

d. On the agenda of a postaward orientation conference, FAR, Part 242.503-1 lists the following:

(1) Special contractual provisions.
(2) Clarification of specifications.
(3) Production planning.
(4) Packaging and shipping.
(5) Prime contractor responsibilities for subcontracts.

e. The review of contracts by packaging specialists serves several essential purposes:

(1) Identifies new contractors and the packaging requirements placed on them so that the need for postaward contractor orientation may be determined and assistance provided as required before problems develop.

(2) Identifies new or different packaging requirements prescribed by acquisition activities which may demonstrate a need for coordination with the acquisition activities to establish needed uniformity.

(3) Identifies packaging requirements of a special nature which need emphasis or clarification such as the special packaging and marking of items defined as dangerous for air shipment.

(4) Identifies contracts in which packaging requirements are obviously missing, erroneous, inadequate, or excessive for the level of protection specified. Although inadequate or excessive requirements are not readily identified apart from a rather intimate knowledge of the item(s) involved, a DCAS packaging specialist may have this knowledge of some items or be able to obtain essential information easily. When a change in packaging requirements is determined to be appropriate, such change will be recommended by the packaging specialist in accordance with FAR, Part 10.004 (E).

(5) Identifies contracts which require preproduction tests of engineered packaging designs so that necessary technical liaison may be established.

(6) Identifies contracts which require packaging data review and/or approval by packaging specialists.

10-3. Postaward Orientation

a. Postaward packaging orientation meetings will be scheduled with a contractor when preaward survey findings, contract reviews, or experience indicate the need for special indoctrination or instruction of contract's personnel in Government packaging requirements as they pertain to contracts.

b. Meetings will cover any deficiencies indicated in the SF 1403 (Preaward Survey) as well as general procurement policies in such additional areas as contractor development of packaging designs, preproduction pilot packs, special packaging, delineation of packaging approval authority, acceptability of variations, weight and cube reduction program, packaging cost reduction program, standardization of packaging methods and materials, materials handling, change procedures, consolidation of shipments, packaging and handling of dangerous materials for Department of Transportation (DOT) and/or military or commercial air shipments, car loading, and damage control.

c. Whether orientation meetings are formal or informal, efforts will be made to establish an effective focal point in the contractor's organization for the resolution of packaging problems.

10-4. Data Approval

a. "Data" refers not only to preservation and packaging data developed under MIL-STD-2073 but to any packaging or packing requirements developed, revised, or approved by DCAS packaging specialists where responsibility has been so delegated. It includes items such as Defense Industrial Plant Equipment (DIPE) items requiring special packaging designs, preproduction pilot packs or samples of containers, bracing, and blocking, or other similar devices. Where possible, DSA Form 528, (Packaging Requirements Worksheet) will be utilized to approve, clarify, or disseminate data (fig 10-1).

b. For contracts where the submission and plant level approval of data is specified, the DCAS packaging specialist will review and approve the data as required.

c. When required or authorized by the acquisition activity, a packaging specialist will review and approve packaging data, pilot packs, specially designed containers, special cushioning, blocking, and bracing, and vehicle loading plans. Unless otherwise specified in the contract, packaging detail requirements will be coded in accordance with military standard MIL-STD-2073, Packaging Requirement Codes. Coded packaging data, narrative type packaging descriptions, and packaging drawings will be approved by application of the DCASR Approved Packaging Data Stamp of the approving packaging specialist. Such approvals will normally require visiting the manufacturer's facility to review the characteristics of items as defined on drawings, and by physically examining items to determine packaging and container requirements.

d. The fundamental objectives in reviewing and approving packaging data are to assure standardization of packaging methods and detailed designs which will provide the necessary protection effectively, economically and in consonance with current DOD packaging policies.

PACKAGING REQUIREMENTS WORKSHEET

DSAM 8300.1

PURPOSE: To translate and/or definitize packaging requirements of orders or contracts which specify packaging requirements code as outlined in MIL-STD-726.

PROCEDURE:
1. QA personnel may use this form to translate MIL-STD-726 coded requirements into clear language to facilitate inspection.
2. Packaging specialists may utilize this form for:
   a. Specifying preferred details of optional requirements
   b. Transmitting approved packaging changes to contractor, inspector and/or procurement contracting office. (Packaging specialist will affix approval stamp).

NAME OF CONTRACTOR	CONTRACT NUMBER	
John X Glutz, Inc.	AF 500-33-29760	
CONTRACTING OFFICE	**ITEM NAME AND NUMBER**	**FSN**
Warner Patterson Air Force Base	Widgets, Scrofulized	6540-00-357-9996

DIGIT POSITION	DETAIL	SEE TABLE	CODE	REQUIREMENTS
1 2	METHOD OF PRESERVATION	II, IIa IIb, IIc	DC	Method I modified MIL-B- 22191 Type II Bags
3	QUANTITY PER UNIT PACKAGE	III	1	1 each
4	CLEANING AND DRYING PROCEDURE	IV	6	Cold solvent or vapor degreasing followed by fingerprint removal (MIL-C-15074)
5 6	PRESERVATIVE MATERIAL	V	06	P-6: MIL-C-11796-Petrolatum, Solf Film, Hot Application-Required only on unplated surfaces
7 8	WRAPS	VI	XX	Bag as stated in 1 & 2 above. Use dcuble bags if item is over 10 pounds.
9 10	CUSHIONING AND DUNNAGE	VIa	XX	Not applicable on this unit.
11	CUSHIONING THICKNESS	VIb	Y	Contractor's Option - None Required on this Unit.
12 13	UNIT CONTAINER	VII	DA	Each bag shall be placed in a folding carton PPP-B-566 - (or equivalent)
14	INTERMEDIATE CONTAINER QUANTITY	VIII	A	10 Unit Packages
15 16	INTERMEDIATE CONTAINER	VII	EC	Domestic Fiberboard Shipping Container PPP-B-636
17	LEVEL OF PROTECTION	IX, IXa, IXb	H	Level A protection. Unit container sizes are to be coded according to Table Xb
18 19	MAXIMUM WEIGHT	XI	-	These data not available to the procuring
20 21	MAXIMUM CUBE	XII	-	activity. Contractor is requested to
18 19	MAXIMUM LENGTH	X, Xa, Xb	-	determine them and furnish completed code
20 21	MAXIMUM WIDTH	X, Xa, Xb	-	to procuring activity when available.
22 23	MAXIMUM DEPTH	X, Xa, Xb	-	(Use Table Xb).

SPECIAL REQUIREMENTS - None

NOTE: Contact preservative requirement appears to be excessive. Contractors comments and recommendations are solicited for DCASR Packaging Specialist review.

PKG. APPROVAL STAMP

DSA FORM 528 SEP 65 • REPLACES NAVEXOS FORM 4030/1 WHICH IS OBSOLETE WITHIN DSA

SMPT 2274A

FIGURE 10-1. PACKAGING REQUIREMENTS WORKSHEET

e. Packaging specialists will coordinate any actions required to finalize packaging design or obtain timely approval from procurement or packaging design control offices.

Section II. DEFENSE CONTRACT ADMINISTRATION SERVICES (DCAS)

10-5. Background and Organization

a. Defense Contract Administration Services (DCAS) is established within the Defense Logistics Agency (DLA) as one of its major components for the administration of defense contracts.

(1) DCAS provides contract administration services for contracts of the Military Departments, DLA, other Federal and State agencies upon request and, when authorized, to foreign governments.

(2) On an exception basis, the Military Departments retain the administration of contracts for civil works, military construction, shipbuilding, and certain major weapons systems.

b. Contract administration is a technical and administrative service in support of buying activities and is performed at or near contractor establishments to facilitate contract performance and to assure compliance wtih terms and conditions of government contracts. Contracts are normally assigned to DCAS after award by the acquisition agencies. The technical and administrative services involve quality assurance, transportation, packaging, progress and status surveillance, on-site engineering services, industrial security provisions for classified contracts, timely delivery, payment and other functions essential for contract completion in accordance with specifications.

c. DCAS currently administers approximately 396,000 prime and support contracts with an estimated value of $242 billion covering a broad spectrum of defense materials and services through nine Region Centers and 37 Management Area Offices as well as numerous Plant Representative Offices (DCASPROs).

d. The principal functions of Defense Contract Administration Services are (fig 10-2):

(1) *Contract administration activities*, such as financial analysis, review of contractor purchasing and estimating procedures, price and cost analysis, final determination of allowability of costs, administration of government property, disposal of excess and surplus contractor inventory, convenience termination settlements, and assuring compliance with terms, conditions and clauses of contracts.

(2) *Production activities*, such as performing pre-award surveys, monitoring progress of contractors' production efforts, expanding the Department of Defense Value Engineering Program, providing services related to labor standards and disputes and industrial manpower requirements, performing industrial mobilization planning activities.

(3) *Transportation and packaging activities*, such as reviewing adequacy of contractors' traffic operations, performing traffic management services, executing duty-free entry certificates, issuing and controlling movement documentation and review, and evaluating the adequacy and cost of preservation, packaging and packing in terms of DOD policies.

(4) *Engineering activities*, such as review of the contractors' engineering design, development and production engineering efforts; performance of engineering and technical evaluations of contractor proposals; surveillance of engineering management systems, and evaluation of the use of engineering resources to meet contractual engineering requirements.

(5) *Quality assurance activities*, such as product inspection and testing, evaluation and verification of contractors' inspection system or quality program detection of unfavorable quality conditions or trends, initiation of corrective action, and determining whether the contractor has complied with contractual requirements.

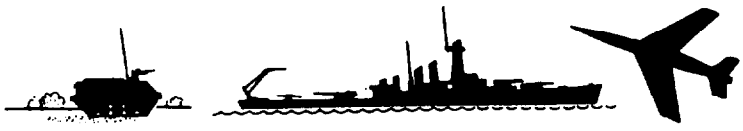
(6) *Industrial security program* of the Department of Defense to insure effective protection of classified information, including foreign classified information in the hands of contractors. (Security clearance of contractor personnel has been centralized in the Defense Industrial Security Clearance Office in Columbus, Ohio.)

(7) *Data and financial management activities*, such as payments to contractors and providing financial status and contract delivery status to procuring activities, inventory managers, and internal management.

(8) *Support to Small Business and Labor Surplus Area*, such as determining contractors' compliance with the small business and labor surplus area mandatory subcontracting program, prime contractors' source development, counseling businessmen on government business.

10-6. Advantages to the Contractor

a. Establishment of Single Point of Contact for Contract Administration. DCAS does away with multiple Government representation in contractor plants with the attendant overlapping and confusion which has existed in the past. A single Government spokesman acts as the focal point for



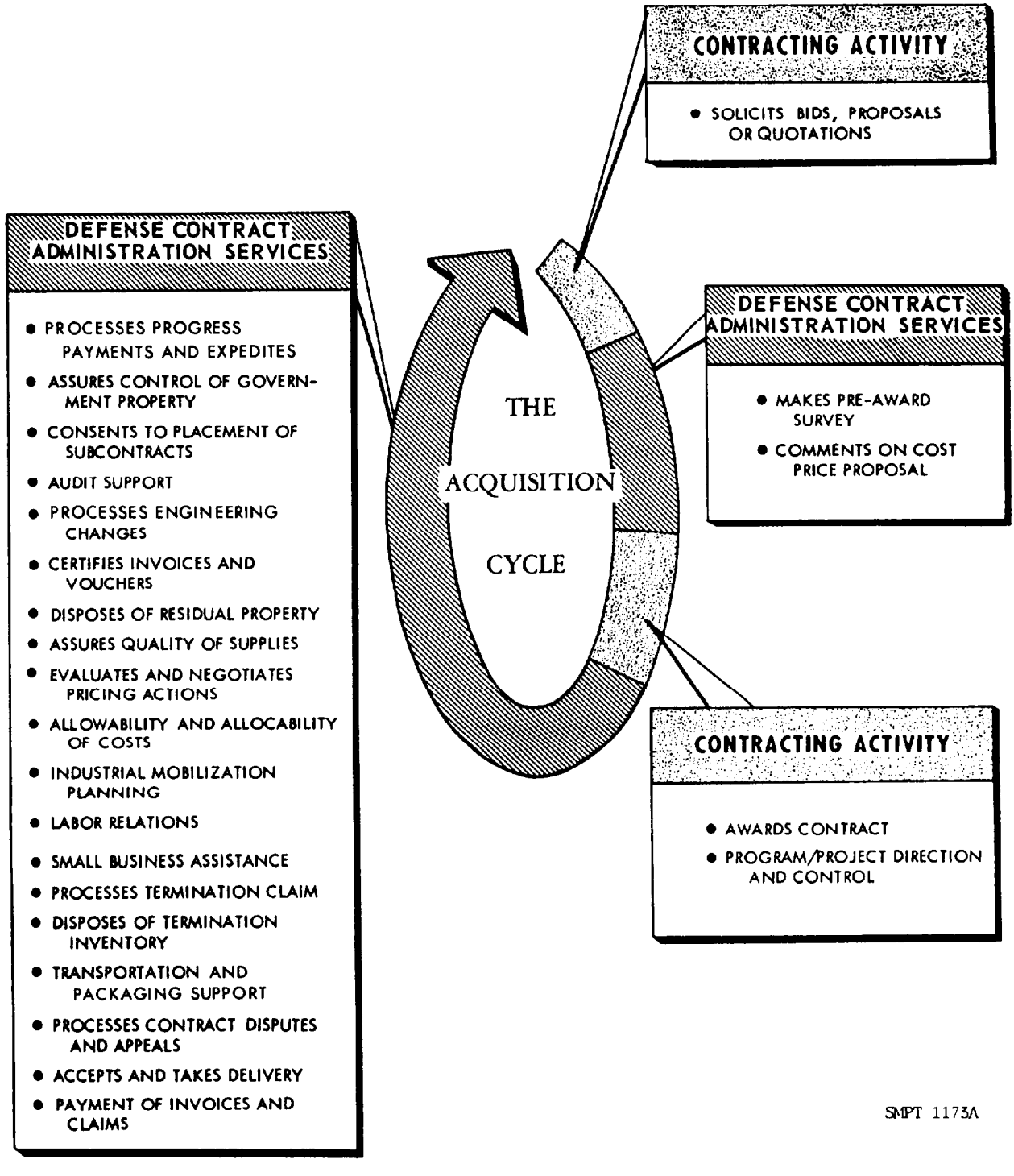


FIGURE 10-2. DCAS AND THE ACQUISITION CYCLE

the Department of Defense in its relationship with the contractor.

b. Application of Uniform Procedures. Multiple sources of policies and procedures with widespread divergencies in methods, forms, organizations, and requirements levied on industry has been eliminated. Functional guidance is issued in single publications, minimizing the varying service interpretations of basic directives and instructions. Responsiveness to Government requirements has been sharpened and training programs simplified.

c. Reduction of Government of Surveillance and Surveys. With the establishment of a single point of contract under DCASR, a great deal of needless repetition and multiplicity of Government effort in the administration of contracts are eliminated. Surveys conducted by several different groups of people in identical areas have been combined to bring about greater efficiency on the Government side and less expenditure of time and effort on the part of contractors.

d. Decrease in Government Controls Over Industry. The multiplicity of procedures established by the three services and DLA imposed requirements upon industry which were confusing and costly to administer. Reducing the number of implementation directives decreased the controls now imposed on industry. Not only did this result in monetary savings but it promoted greater efficiency and mutual understanding.

e. Reduction in Operating Costs. Defense contractors were faced with the necessity of responding to a bewildering variety of resident and itinerant contract administration personnel and widely divergent Government requirements. Through the merger of personnel and the establishment of more uniform requirements on the Government's side, the number of contractor people and monetary expenditures not devoted to meeting these demands can be significantly reduced with resultant savings both to Government and industry.

f. Reduction of Requirements and Greater Uniformity in Reporting. Multiple procedures and reporting requirements have been reduced and streamlined to accomplish the overall task more effectively. This is another advance which will save both industry and Government a great deal of time and money.

CHAPTER 11
QUALITY ASSURANCE OF PACKAGING

Section I. TESTING AND PROVING

11-1. Department of Defense Quality-Assurance Policy

a. The basic quality-assurance concept of the Department of Defense is based upon the fact that—

(1) Contractors are responsible for the quality of products and services furnished by their suppliers by means of contract provisions that place responsibility on contractors and the Government's right to reject or return contractor-responsible defective items for repair or replacement.

(2) DoD components will assure that all services provided and products designed, developed, purchased, produced, stored, distributed, operated, maintained, or disposed of, by or for the Department of Defense, conform to specified requirements.

b. DoD components will plan and implement a quality program as an integral part of all phases of the acquisition and support process and will conduct quality audits to assure the attainment of quality products and services.

(1) The defense quality-assurance representative makes optimum use of quality data generated by contractors in determining the acceptability of supplies.

(2) To the extent that contractors' quality data are available and reliable, such data is used to adjust the amount of defense inspection of products for acceptance purposes to a minimum consistent with the proper assurance that the supplies accepted conform to the quality requirements established by the acquisition documents.

c. A product deficiency reporting and data feedback system will be established and implemented within each DoD component.

d. Among the requirements included in contracts are those pertaining to preservation, packing, and marking. These requirements, as with all other requirements, should be as clear and as concise as possible in order to avoid any conflicts between the contractor and procurement activity as far as interpretation is concerned.

11-2. Definitions

For purposes of this chapter, the following definitions will apply:

a. Quality (Q). The composite of materiel attributes including performance, features, and characteristics of a product or service to satisfy a given need.

b. Quality Assurance (QA). A planned and systematic pattern of all actions necessary to provide adequate confidence that adequate technical requirements are established, products and services conform to established technical requirements, and satisfactory performance is achieved.

c. Quality Control (QC). A management function whereby control of quality of raw or produced material is exercised for the purpose of preventing production of defective material.

d. Quality Assurance Representative (QAR). The individual directly charged with performance of the Government contract quality assurance function at a contractor facility.

e. Contract Quality Assurance (CQA) Program. The various functions, including inspection, performed by the Government to determine whether a contractor has fulfilled the contract obligations pertaining to quality and quantity.

f. Inspections. The examining and testing of supplies or services (including, when appropriate, raw materials, components, and intermediate assemblies) to determine whether they conform to contract requirements.

g. Testing. The element of inspection that determines the properties or elements, including functional operation of supplies or components, by the application of established scientific principles and procedures.

11-3. Responsibilities for Quality Control and Quality Assurance

a. Contractors and Suppliers.

(1) Contractors and suppliers are responsible for performing the inspections, tests, and examinations which are required by specifications or as otherwise required by the contract. In addition, contractors and suppliers must provide for adequate examination and test facilities, as well as maintain records of such tests and examinations performed, including any corrective action taken.

(2) The contractor's quality-control system should be designed to sound an immediate warning when something starts to go wrong, rather than after hundreds of thousands of defective items have been made or assembled. If quality-

control figures are kept for every process, they will often indicate the probable causes for difficulties encountered; they may even predict oncoming trouble before it happens.

b. Defense Quality Assurance Representatives. Defense quality assurance representatives apply techniques of product verification inspection as established by the Joint Manual "Contract Quality Assurance" to determine contractor's compliance with the provisions of the contract and to evaluate the effectiveness of the contractor's inspection or quality-control system. Quality assurance representatives will also coordinate with contractors on performance of expensive or destructive tests.

(1) The extent of Government CQA of a contractor's tests and examinations will be influenced by these factors—

(*a*) Quality history.

(*b*) Importance or complexity of packaging or processing.

(*c*) Inspection capabilities.

(*d*) Hazards Involved.

(2) The CQA program will include provisions for inspection and calibration procedures for the contractor's gages, measuring equipment, and test equipment.

11-4. Quality Assurance for Acceptance of Packaging

a. General. Packaging inspection shall be performed as specified in the contract. The basic tests, examinations, and inspections are specified in section 4, MIL-P-116; these tests are briefly covered in *d* below.

b. Classification of Inspection.

(1) *First article inspection.* When unit pack design validation is required in the contract or order, the contractor subjects sample packs of the specified commodities selected prior to or during initial production to all applicable examinations and tests.

(*a*) First article testing is repeated when changes in materials, processes or designs have been made.

(*b*) First article samples consist of the same materials and are produced by the same methods and are fully representative of the planned production unit pack.

(2) Quality Conformance Inspection. Quality conformance inspection consists of those examinations and tests required for acceptance by the Government.

(*a*) When necessary to perform inspection prior to application of preservatives, wrappings, or containers; when advantageous to the method of production or when performed in order to eliminate the need for destroying completed packages, applicable quality conformance examinations and tests are performed at one or more appropriate stages in the actual processing of the item.

(*b*) However, the Government may perform CQA of the completed package or pack, as applicable, which may entail its destruction.

(*c*) Except as provided above, all the quality conformance examinations and tests of MIL-P-116 are independent of each other to the extent that they may be performed on the same or on different sample units.

(*d*) Whether the examinations and tests are performed progressively during the stages of processing or accomplished upon completion of the pack the results shall show that the method of preservation as accomplished, has the capability of withstanding all applicable tests indicated.

c. Statements of Findings. Specifications for packaging materials set forth the requirements for the materials and the methods for determining that the requirements have been met. These specifications are referenced in section 2 of packaging process specifications.

(1) Contractors responsible for packaging must furnish evidence to the Government that materials have passed the required tests. Statements of findings from the supplier must also be furnished by the contractor for each lot of material received.

(2) Many of these tests must be performed on specialized equipment or must be made in a laboratory equipped to perform required physical and chemical tests. Statements of findings provided by other than Government or approved laboratories will not be acceptable by the Government.

(3) In case of doubt at any time as to the quality of packing materials, the Government representative should submit samples of such materials to a Government laboratory for inspection and tests.

d. Tests, Inspections and Examinations of Packs. Packaging specifications and other packaging instructions require the use of specific materials for the wraps, cushioning bags, cartons, boxes, and other containers. It is necessary to determine that selected preservation materials and methods have been effectively combined in such a manner as to provide the required protection to the item.

(1) The tests which are applied to packs are performance tests which prove the closure of the pack and the efficiency of the shock mitigation

materials or devices used for the protection of the item.

(2) The inspections and examinations relate to the quality of workmanship and compliance with the contract requirements.

(3) The various tests, inspections, and examinations required prior to acceptance are explained in detail in section 4, MIL-P-116, and in Federal Test Method Standard No. 101. These examinations and tests are segregated into two groups—

(*a*) *Group A examinations.* These are in-process examinations which are mandatory for acquisitions involving packaging. This group involves—

1. Determination of item cleanliness before applying preservative, wrap, bag or barrier.

2. Proper application of required preservative.

3. Proper use of designated wraps, cushioning, flexible barrier, strippable compound, containers, desiccant, humidity indicators, windows and gaskets in fabricating packs.

4. Use of required cushioning, blocking, bracing or bolting in fabricating packs.

5. Complying with specific maximum weight and cube requirements and with good workmanship.

6. Comparing part number with pack identification marking; quantity check, and designated unit pack markings correct and properly applied.

(*b*) *Group B examinations and tests.* These are final tests which are also mandatory for acquisitions involving packaging. This group involves—

1. Using containers as required.

2. Correct and properly applied container markings.

3. Leakage tests to determine waterproofness of packs.

4. Heat sealed seam test applied to packs employing a heat-sealed closure.

(*c*) When specified in the contract or order, these additional tests will be performed—

1. Cyclic-exposure test, consisting of exposing the pack to simulated and varying weather hazards during prolonged periods.

2. Rough handling tests, which comprise freefall drop tests, tipover and rotational drop tests, impact tests, superimposed load tests and vibration tests.

3. Determination of preservative retention test.

11-5. Importance of Packing Quality Assurance

a. A large portion of the national budget is expended by the Department of Defense for the acquisition of military equipment and supplies. A great amount of Government and industrial manpower is expended in the design and manufacture of this material. Much effort has also been devoted to the development of inspection procedures to assure that material conforms to establish standards of quality and reliability. The purpose of quality control and quality assurance is to provide our military personnel with the best equipment in the world.

b. Unfortunately, there are too many instances of quality assurance stopping at the end of the production line at which time items are often inefficiently or ineffectively packaged. Time, money and effort are needlessly wasted when permitting an item to deteriorate during shipment and storage. Quality assurance of packing is just as necessary as quality control of the commodity in order to assure that materiel is delivered in a ready-for-issue condition.

Section II. ROLE OF THE PACKAGING SPECIALIST IN ASSISTING QUALITY ASSURANCE

11-6. Review and Analysis

a. Packaging specialists, being familiar with all aspects of preservation, packing, marking, unitization, palletization, and containerization, are qualified to provide technical assistance to QA personnel. In addition to reviewing and analyzing the packaging requirements of contracts in order to ascertain that the prescribed packaging will give adequate protection at minimum cost, the packaging specialist must be sure that the contract calls for the proper tests, inspections, and examinations in order to ascertain that the packaging requirements have been met. The packaging specialist should constantly be aware of improved materials and processes and of any new methods for testing these materials and processes.

b. The packaging specialist may be requested to review and analyze requests for changes in specifications or contracts in relation to substitution of materials and processes. The use of newer and less-expensive material will not result in a money savings if it fails to give the required protection to material.

c. Some activities require the contractor to develop the detailed packaging requirements for an item if none are in existence. In such cases, the

packaging specialist provides the technical guidance to the contractor to assure that the packaging design is effective, economical, and meets the general requirements prescribed in the contract.

11-7. Advice and Assistance

a. The packaging specialist serves as a technical advisor to the contractor and quality-assurance personnel relative to the packaging and packing requirements that must be met and the tests required.

b. The packaging specialist must advise the cognizant acquisition activity of instances when specified requirements are inadequate, excessive or confusing.

c. The packaging specialist furnishes technical advice and information involving interpretation, clarification, and coordination of preservation and packing specifications and instructions to contractors and quality assurance personnel. The packaging specialist should be sure that both parties to a contract are mutually in agreement concerning the packaging inspections and tests required.

CHAPTER 12
VALUE ENGINEERING

Section I. APPLICATION OF VALUE ENGINEERING IN PACKAGING

12-1. Value Engineering Defined

a. In the DOD, value engineering (VE) is defined, with respect, to packaging, as a systematic effort directed at analyzing the functional requirements of packaging systems, equipment, facilities, procedures, and supplies for the purpose of achieving the essential functions at the lowest total cost, consistent with the needed performance, reliability, quality, and maintainability.

b. Although there are numerous other published definitions of VE, most are merely minor variations of this definition and none appears to contradict it. Value Engineering is the term used by the DOD in its publications and in its contracts. Others may refer to their value improvement efforts by such terms as Value Analysis, Value Control, or Value Management. There may be some subtle differences between these other programs and VE, but the basic objectives and philosophy appear to be the same for all.

c. In a narrow sense, to differentiate value analysis from value engineering, the former is the analysis made on an existing design to effect cost reduction and improve performance.

12-2. VE in Packaging Operations

Packaging operations are especially susceptible to the application of value engineering techniques because of the continual introduction of new packaging materials, and also because items are being constantly improved, requiring continuous scrutiny of their packaging requirements.

12-3. Techniques of Value Engineering

a. Value engineering is usually performed in six successive steps or phases—

(1) *Information phase.* The purpose of this phase is to gather and tabulate data concerning the item, to determine the item function, and to evaluate the function.

(*a*) The accuracy of this information is imperative, since it is the basis for subsequent decisions.

(*b*) The determination and evaluation of the function are the most important elements in a value analysis, since they are the elements through which the same or better performance may be achieved at less cost.

(2) *Speculative phase.* During this phase alternate methods for providing the item function are generated.

(*a*) This is the creative part of value analysis, sometimes called "brainstorming."

(*b*) "Brainstorming" is defined as the combined effort of two or more individuals to determine, *without judicial evaluation,* all the methods of performing the necessary functions, *without inventing new processes or contrivances.*

(3) *Analytical phase.* The purpose of this phase is to develop the alternate methods listed during the speculative phase, listing the advantages and disadvantages of each.

(*a*) The dollar value of each method is either estimated or computed.

(*b*) The methods which offer the greatest potential cost savings are then selected for further study.

(4) *Program planning phase.* In this phase, the value engineer establishes a program of investigation for study of alternate methods selected in the analytical phase.

(*a*) Vendors are contacted for specific material, process, and cost data. Solutions to the problem are discussed with the product engineer, with whom suggestions and opinions are interchanged. If the problem concerns packaging, the packaging specialist will be consulted.

(*b*) The cost of each of the solutions is refined, taking into account quality assurance, packaging, and transportation and a determination is made of a "best" and an "alternate" recommendation for the combination of basic functions.

(*c*) The cost of these recommendations, best and alternate, are compared with the value goal by computing the percent of accomplishment.

(5) *Program execution phase.* The purpose of this phase is to gain firm information concerning the alternate methods. This is the most important administrative effort of the value engineering program. The preparation of the proposal has an important bearing on the acceptance of the submitted recommendation. The report should be in three parts.

(*a*) The value engineering recommendation sheet, with accurate concise data.

(*b*) Simple sketches, clearly depicting the proposed changes.

(*c*) Copies of pertinent brochures or informal quotations. All cost figures used for comparison

purposes must be based on like production or procurement quantities.

(*d*) The narrative of the proposal should include any significant reasons for accepting the proposal in addition to savings which may be realized.

(b) *Presentation and followup phases.* During this phase, a report is prepared, issued to the decision maker, and necessary action is taken to assure acceptance of the proposal prior to any acquisition commitments for the project item.

(*a*) Upon completion of the formal proposal, it is routed through proper channels to the cognizant organization for approval and implementation. A copy of the recommendation sheet is furnished acquisition personnel as a matter of interest and information.

(*b*) An efficient followup system in the value engineering activity, to simplify control over projects pending approval, is important since savings on current acquisition is only realized through timely coordination between approval and acquisition.

b. The techniques, key questions, and tests for value are listed in the Value Engineering Flow Chart (see table 12-1).

(1) These interrelationships serve as a guide in developing data during each phase of the value analysis job.

(2) For specific applications, the value engineer may select part of the techniques, illustrated, or may develop additional ones more suited to a particular project.

12-4. Areas of Application

A few of the several methods of identifying areas where value engineering can be applied most profitably include—

a. Reports which indicate a high scrap or rework rate. This would indicate a prime field for value engineering, since any improvement would reduce costs significantly.

b. Acquisition problems, such as sole source of supply and past due deliveries. The application of value engineering to these problems would be invaluable.

c. A history of frequent redesigns and engineering modifications associated with an item. If the application of value engineering techniques can finalize the development of an item, the potential savings in engineering costs would be very worthwhile.

d. Observation in the manufacturing areas. Very often the critical observer can see where improvements can be made in operations, whereas the operator is too involved in his tasks to see the whole picture.

e. Discussing the latest developments and various products with the vendors. This is a prime source of information on new materials and techniques.

f. Reviewing trade magazines and publications of professional societies. This is another source of information on new materials and techniques which may be found useful.

Section II. VALUE ENGINEERING IN ACQUISITION

12-5. Policy

a. The inclusion of value engineering clauses in acquisition contracts is now the policy of the Department of Defense.

b. With the exception of those contracts listed in the Federal Acquisition Regulation (FAR), value engineering clause shall be included in all fixed-price-type and cost-plus-incentive-plan contracts on $100,000 or more, that incorporate firm specifications, unless the head of the acquisition activity has determined that value engineering has no potential for cost reduction as to the item or class of item being acquired.

c. Value engineering incentives may be included in contracts of lesser value at the discretion of the contracting officer.

12-6. Value Engineering Incentive Clause

a. The value engineering incentive clause sets up a formula by which the contractor and the Government share any savings resulting from this program.

(1) The precise extent to which the contractor should share in cost reduction must be tailored to the particular procurement situation.

(2) Normally, the contractor's share in any cost reduction shall be 50 percent of the amount by which the contract price is reduced as a result of the adoption of the cost reduction proposal, but in no event shall be contractor's share exceed 75 percent.

b. A value engineering program requirement with incentive differs from a value engineering incentive in that it will be stated in the contract as a line item.

(1) It is a contract provision that obligates the contractor to engage in a program requiring a specified level of value engineering effort, and in addition, provides for the contractor to share in

cost reductions resulting from proposals submitted by the contractor and adopted by the Government.

(2) It is generally desirable to limit the use of value engineering program requirements with incentives to cost-plus-fixed-fee contracts. In this type of contract, where the Government reimburses the contractor for allowable costs, the contractor shall not share in the adopted reductions until such reductions exceed the Government funding by an amount specified in the Federal Acquisition Regulation.

(3) This part of the FAR also sets dollar limits, which increase with contract value, on the amount of Government funding, including labor, material, and overhead for a required value engineering program.

(4) This document also sets up the procedure for submitting and evaluating cost reduction proposals.

Section III. APPLICATION OF VALUE ENGINEERING TO PACKAGING

12-7. General

a. Packaging, which is considered to be the bridge between the production and distribution cycles, is a factor in most value engineering projects.

b. In some cases, packaging requirements may undergo change because of value-engineered improvements in the item; while, in other cases, the packaging itself might be the subject of the value analysis.

c. The packaging specialist may be called upon for technical advice by the value engineer. In these instances the packaging specialist must be alert to the possibility of employing new materials or techniques to achieve adequate protection at minimum costs.

12-8. Packaging Cost vs. Reliability

a. One of the tests the value engineer may apply to packaging is to measure the cost of the package against its reliability.

(1) Packaging cost includes the cost of labor and material (including all applicable overhead charges, burden rates, and profit) required to package an item or group of items for shipment or storage. It also includes the cost of transporting the tare weight of the shipment at the rate which applies to the packaged item.

(2) Reliability reflects the length of time the package will continue to afford the required protection.

b. By plotting the costs of alternate methods of packaging on a graph (fig 12-1) against the reliability of the packages, and also developing a curve based on reliability and the cost of maintaining reliability, the value engineer can analyze the ideas produced during the speculative phase of the study.

(1) In a general way, the cost of the packaging will vary with the reliability, as shown in curve A. As reliability approaches 100 percent it takes an increasingly greater increment of cost to achieve a given increase in reliability.

(2) On the other hand, the cost of maintaining the protection given by the package, including the cost of repackaging when necessary, decreases as reliability increases, as shown by curve B.

(3) Adding these two curves together we achieve curve C, which represents total cost. We can immediately recognize the minimum cost as the lowest point of the curve.

(4) However, because the slope of the curve at this point is very slight, it is evident that a substantial increase in reliability can be achieved at very little additional cost. This is the optimum point which the value engineer will endeavor to reach as a result of his work.

c. A project completed by value engineers at Watervliet Arsenal, N.Y., is an excellent example of how the techniques of value analysis can achieve significant cost reductions in packaging (fig 12-2).

(1) The subject of the study were the shipping containers used to transport 8-inch howitzers from the arsenal to Aberdeen Proving Ground, MD. The material cost of the prototype container was $75 and the labor cost (including burden) was $212.63 for a total cost of $287.63. Two hundred and seventy containers were required under the contract for a total projected cost of $77,460.

(2) During the speculative phase four ideas were presented: the use of straps, sweeps, a modified container, and a rack.

(3) In the analytical phase, the use of sweeps was considered the "best" method, with the modified container as an alternate.

(4) In the program planning phase of the project, it was decided to have prototype sweeps made; mount the gun on these sweeps, with supervision from the design engineers to assure proper positioning; and to make a trial shipment to Aberdeen Proving Ground, following up on the shipment to discover problem areas, if any, and to solve these problems before submitting the project.

Table I. Value Analysis Flow Chart

Value analysis job plan	Twenty techniques	Key questions for value	Ten tests for value
1. Information Phase Purpose:			
a. To gather and tabulate data concerning the item.	Use better human relations. Overcome roadblocks. Get all the facts. Bring new information. Get information from best sources. Get dollar on key tolerance.		Does its use contribute value? Is it made on proper tooling, considering quantities involved? Does material, reasonable labor, overhead, and profit total its cost?
b. To determine the item function.		What is it? What does it do?	
c. To evaluate the function.	Evaluate the function. Evaluate by comparison.	What does it cost? What is it worth?	Does it need all of its features? Is its cost proportional to its usefulness?
2. Speculative Phase			
Purpose: To generate alternate methods for providing the item function.	Blast—Create.	What else will do the job?	Is there anything better for the intended use? Can a usable part be made by a lower-cost method? Can a standard product be found which will be usable? Will another dependable supplier provide it for less? Is anyone buying it for less?
3. Analytical Phase Purpose:			
a. To develop alternate methods generated during the Speculative Phase listing advantages and disadvantages of each.	Refine Use the companies' services.		
b. To estimate the dollar value of each method.	Put dollar on main ideas. Use shop cost.	What does it cost?	
c. To select methods which offer the greatest potential cost savings.			

Table 12-1.—Continued.

4. Program Planning Phase Purpose: To establish a program of investigation for study of alternate methods selected in the Analytical Phase.	Work on specifics, not generalities. Spend company's dollar as you would your own. Plan to— Use standards. Use specialty products and materials. Use specialty processes.		
5. Program Execution Phase Purpose: To gain firm information concerning your alternate methods.			
6. Presentation and Followup Phase Purpose: a. To prepare a report. b. To issue the report to the decision maker. c. To insure that proper action is taken.			

Note. The above interrelationships of the techniques, questions, and tests, to the job plan were developed for your benefit. You may have your own ideas of what the relationships should be.

Caution. **For clarity, each technique, question, and test is recorded only once in relation to the job plan. In actual usage these items would be repeated several times as various phases of the job plan are accomplished.**

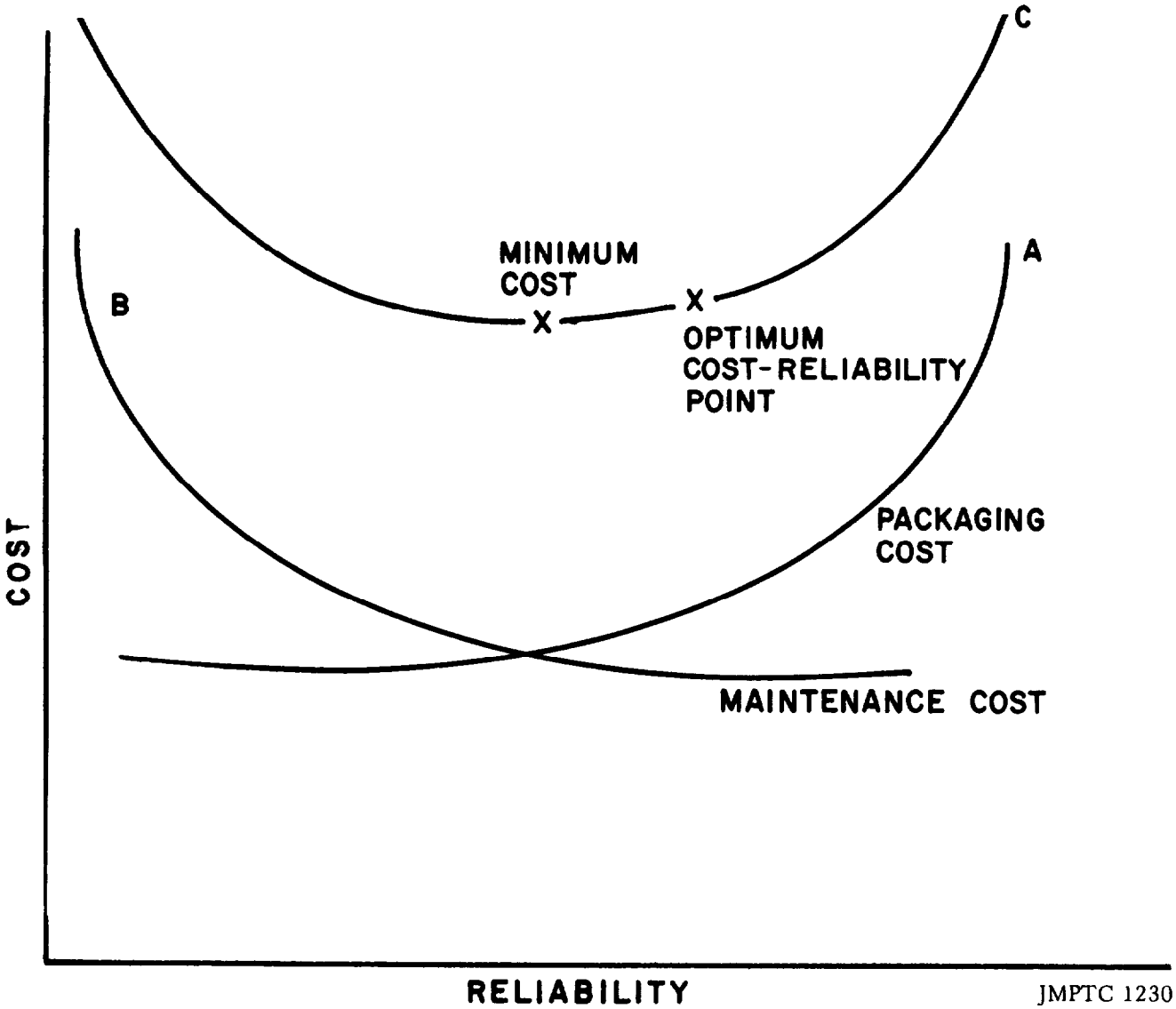


FIGURE 12-1. COST VS. RELIABILITY CURVES

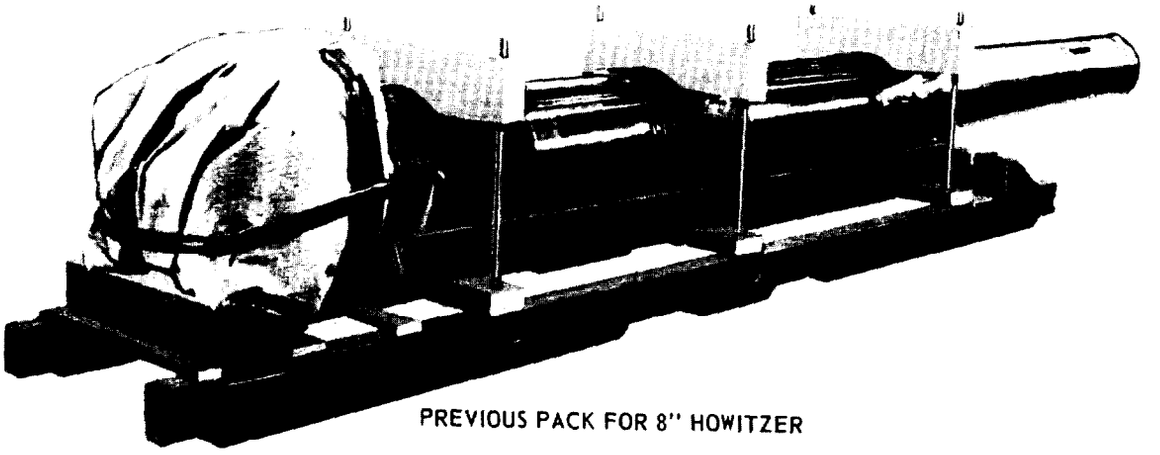
(5) This program was executed as planned. The material cost of the sweeps was $25 labor (including burden) $54, for a total cost of $79. An additional $100 was charged to the entire job order for tools, making a total cost of $21,430.

(6) The cost reduction achieved for the order was $56,030 with additional savings to be realized on future orders, and also by applying this modified packing technique to other size weapons, such as the 175mm gun.

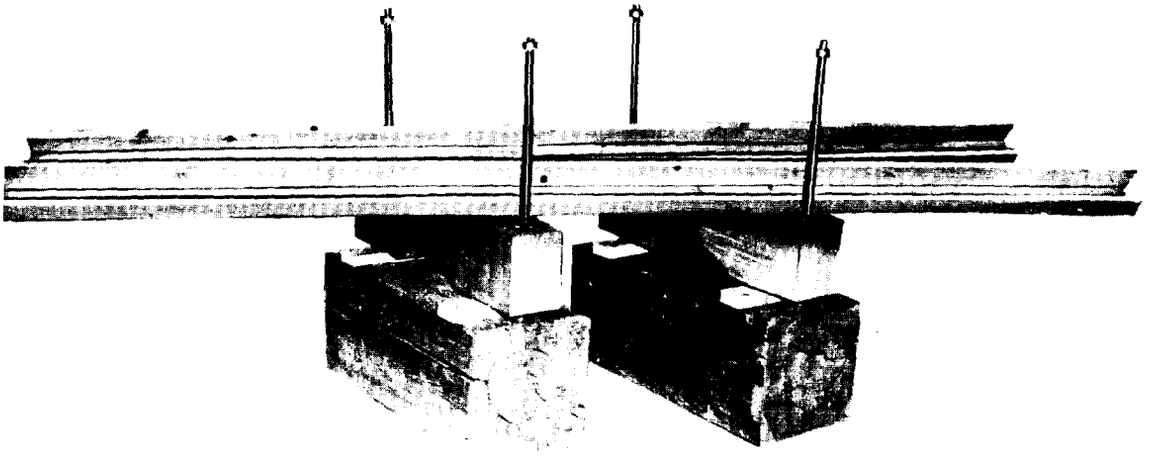
12-9. Conclusions

a. From this example and from many others which have been developed by all the services, it can be seen that the application of value engineering techniques to packaging is rewarded by substantial savings far in excess of the cost of the value analysis.

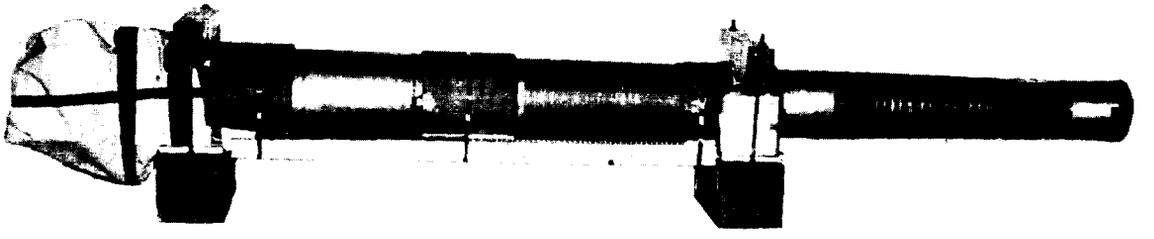
b. The packaging specialist, as a consultant to the value engineer in this area, makes important contributions to the program.



PREVIOUS PACK FOR 8" HOWITZER



SWEEPS



VALUE ENGINEERED PACK

JMPTC 1174

FIGURE 12-2. MODIFIED PACK FOR 8-INCH HOWITZER

CHAPTER 13
TRANSPORTATION AND PACKAGING

Section I. EFFECTS OF PACKAGING ON TRANSPORTATION CHARGES

13-1. General

a. Although perhaps an over simplification, packaging can be thought of as preparing the item and placing it in a suitable container to which transportation attaches wheels and moves it to destination. Storage then becomes interrupted transportation.

b. Many people think of packaging as the end of the production cycle; this is not entirely true. Packaging should also be thought of as the beginning of the distribution cycle and, in turn, as an integral part of transportation. The package accompanies the item from the end of the production to the ultimate consumer; it is the only thing that stands between the item and the harmful effects of physical and environmental forces encountered during distribution.

c. Transportation is by far the greatest factor in the distribution cycle. This includes the movement from the plant to the transportation vehicle on the vehicle, from the vehicle to the storage point, and from the storage point to the consumer. Preservation and packing must be adequate to protect the item during this multiple handling and movement and, at the same time, must be minimal in tare weight and cube so that a minimum about of transportation funds and equipment are spent on moving the packaged item.

d. Traffic management deals with the efficient and economical procurement of transportation service. Traffic managers are generally responsible for selecting modes of transportation, routing shipments, analyzing the costs of moving freight, and reducing such costs wherever possible and practicable. This chapter presents enough information about freight transportation without going into the details of traffic management to enable logistics personnel to understand how efficient packaging and carefully planned packaging requirements can assist the traffic manager in filling his responsibilities; it is also intended to show the effect that traffic manager's decisions often have on military packaging.

13-2. Modes of Transportation

a. The distribution of material throughout the United States and around the world is one of the nation's largest and most vital industries. The military is vitally concerned with the nation's transportation system since it is used to carry military material to CONUS installations and to aerial and water terminals for transshipment overseas. In addition to domestic commercial carriers, the military services use foreign common carriers and military carriers.

b. At the present time there are seven basic modes of transportation available to the military. These modes are:

(1) Rail.
(2) Highway.
(3) Air.
(4) Water.
(5) Pipeline.
(6) Pack animals.
(7) Pack men.

c. Pack animals and men normally are used only in areas where no other means of transportation have been developed or where the other transportation systems have been destroyed by combat or guerrilla action. Pipelines constitute a highly specialized transportation system currently limited primarily to the movement of petroleum, petroleum products, and natural gas. The other modes offer a great variety of transportation equipment and services to the shipper; these modes are also the ones most commonly utilized by the military.

(1) *Rail Transportation.*

(*a*) This is an important mode of transportation utilized by the military services today. Railroads are especially suited for long-distance overland movement of large quantities of material. Railroad equipment is available to move almost every type of item from repair parts to heavy tanks, from poultry to livestock, and from items requiring refrigeration to those requiring heat. Furthermore, railroads are usually unaffected by extremes in temperatures and weather conditions. There are a number of disadvantages of rail transportation, including the ease of disruption by physical failure due to a railroad accident or enemy action of all types, reduction of flexibility because of fixed facilities, and time-consuming transfers of freight and freight cars.

(*b*) The operations of domestic railroads are regulated by the governmental elements: The Department of Transportation (DOT) has jurisdiction over safety matters and the Interstate Commerce

Commission (ICC) continues to regulate economic matters such as operating authority and rates for interstate traffic, although its power has been greatly reduced since deregulation. Intrastate traffic is regulated by State Regulatory Commissions. The railroads have joined together to establish the Uniform Classification Committee and have issued a Uniform Freight Classification which, in addition to being an agreement as to how commodities will be classified for rate setting purposes, also sets down the rules by which the railroads will accept goods for transportation. The DOT Code of Federal Regulations (CFR) Title 49, Parts 100 to 199, sets forth the rules and regulations by which hazardous materials may be carried by rail.

(2) *Highway transportation.*

(*a*) The other mode of transportation frequently used within the United States is motor transportation. Motor freight service is rapid for comparatively short distances because of the availability of direct routes and the avoidance of lengthy terminal delays. Trucks are more flexible than trains in that they have a wider choice of routes and schedules, but they are more subject to mechanical failure, traffic congestion, and weather conditions than trains. Trucks are also employed together with railroads in the concept of intermodal transportation known as Trailer on Flat Car (TOFC) and Container on Flat Car (COFC) service.

(*b*) Interstate motor carriers are also regulated by the ICC and DOT. Intrastate motor carriers are also regulated by the ICC and DOT. Intrastate carriers are regulated by State Regulatory Commissions. In addition, the National Motor Freight Association publishes National Motor Freight Classification. This document generally serves the same purpose for motor carriers as does the Uniform Freight Classification for rail cars. Many interstate motor carriers participate in, and adhere to, the classifications and rules of the Motor Freight Classification. CFR Title 49 details rules and regulations by which hazardous materials may be carried on the highway.

(3) *Water transportation.*

(*a*) Water transportation is utilized for all types of cargo but is especially useful for transporting bulk and liquid cargoes, troops, and large volumes of military supplies to oversea theaters. Although inland water transport is limited to areas served by water facilities, ocean shipping is extremely flexible in its operating radius in that it can reach any part of the world that has harbors or good beaches. Vulnerability to air and naval action during hostilities is an important disadvantage of this mode of transportation. Intermodal transportation concepts have had even greater effects with the introduction of the SEAVAN. SEAVAN has become a significant method of transportation.

(*b*) The ICC regulates domestic interstate water transportation and the State Regulatory Commissions regulate intrastate water transportation. Foreign water transportation, regulated by the Federal Maritime Commission, is effected between the ports of the United States and the ports of other countries through the Great Lakes and/or the St. Lawrence Seaway or the ocean/gulf water routes. The rules and regulations for special requirements governing the transportation of military explosives and hazardous munitions or parts on board vessels are established by the United States Coast Guard. The International Maritime Organization's (IMO) International Maritime Dangerous Goods Code (IMDG) contains the rules and regulations by which hazardous materials may be transported by water.

(4) *Air Transportation.*

(*a*) Where speed in delivery is required, air transportation is generally the most desirable mode. Because air carriers are able to reach any part of the world in the shortest possible time, they have rapidly evolved as an important part of our transportation system for moving both materiel and personnel. Some current disadvantages of air transportation are high freight costs, limited number of communities and industrial areas reached directly by air, and restrictions on the size, weight, and configuration of cargo.

(*b*) The regulating agency for the air carriers is the Department of Transportation. The Air Transport Restricted Articles Tariff and the Restricted Articles Regulations of the International Air Transport Association are documents which classify and set forth the rules for shipment of hazardous materials by commercial air.

13-3. Relationship Between Packaging and Transportation Costs

a. Freight Classifications and Rates.

(1) Freight classification involves the division or grouping of the thousands of articles shipped into classes according to various characteristics and assigning a numeral to each class. This numeral is known as a rating. All items grouped in the same class have the same rating. These classes are called classifications. Classification is the first recognition of an item in transportation terms; from this initial recognition evolves the processes for establishing charges for the movement of material between specified points.

(2) There has been a long, steady growth of

freight classification based on experiences of carriers, customers of the carriers, and Government-regulating agencies. From the early days of turnpikes and canals, when transportation companies separated articles into two classes which were dependent upon the size and weight of the shipping package, there are now approximately ten thousand differently numbered descriptions for articles in the railroad freight classification. Considering the impracticality of fixing a separate rate for each article shipped, the need for a system of grouping commodities is obvious. The carriers have developed a variety of factors which affect the transportation of an article, and have progressed through a series of territorial classification tariffs on two predominant classifications, one for rail and the other for motor transportation.

(3) With all articles grouped into a limited number of classes, each of which is assigned a rating, a rate is set for each class and all items in a particular class have the same freight rate. The difference between a "rate" and "rating" is an important one in the area of freight classification.

(*a*) *Rate.* A rate is an actual dollar and cents charge per unit of weight, per mile, etc. For example, $2.80 per hundred pounds to transport material between two specified points. These dollar charges are published in rate tariffs.

(*b*) *Rating.* The rating of a group of articles indicates the class to which those articles have been assigned for classification purposes. It does not fix the charges in dollars and cents for moving material, but it does designate a percentage of the first-class rate. For example, if the first-class rate is $2.80, a rating of 85 (or class 85) would be $2.38 (85 percent of $2.80).

(4) Freight classifications do not normally publish "rates"; instead, they publish "ratings" which must be used in conjunction with rate tariffs. The National Motor Freight Classification publishes ratings which range from class 35 to class 500 (five time first-class), and the Uniform Freight Classification publishes ratings which range from class 13 to class 400 (four times first-class).

(5) Freight classifications provide for two different ratings depending on the weight of the quantity of an item as it is packed for shipment.

(*a*) *Carload (CL) or truckload (TL) ratings.* The rating applied to a shipment which meets a specified minimum weight.

(*b*) *Less carload (LCL) or less truckload (LTL) ratings.* The rating applied to a shipment which does not meet a specified minimum weight.

(6) There are many cases where different ratings are applied to the same item depending on how the item is packed for shipment. As an example, consider the Uniform Freight Classification ratings for paint-spraying booths.

Description	*LCL Ratings*	*CL Ratings*
Set up in boxes or crates	200	85
Knocked down, other than flat in boxes or crates	150	85
Knocked down, flat	70	37½

b. Freight classification factors. There are many factors involved in placing an item into a class and assigning it a rating. Some of the more important factors are listed in figure 13-1.

c. Freight classification rules and regulations. In addition to giving a description of articles, their classification, and their package requirements, the freight classifications also list numerous rules and regulations governing the manner and form of a shipment from its initial preparation to its delivery at destination.

(1) Some of these rules are highly technical and, in some instances, have legal implications. Other rules are interpretative or describe conditions under which different ratings will apply; these rules can be either a condition under which the shipment is offered to the carrier or the physical condition of the commodity as prepared for shipment.

(2) Whereas the classification of articles also provides the authorized methods for preparing these articles for shipment, i.e., loose, in crates, bundles, bales, boxes, etc., the rules provide penalties for shipments which do not comply with the requirements as to preparation for shipment. In some cases, articles offered for transportation may be refused for shipment unless they are in such condition and so prepared for shipment as to render transportation reasonably safe and practicable.

(3) One rule provides that if differently rated items are mixed, the total weight will be charged on the basis of the highest rated article within the pack. Another rule covers all ICC regulations for shipping materials in fiberboard boxes, explaining how certain materials are packed, size of containers, bursting strength of fiberboard, methods of closure, etc.

d. Preservation, Packing, and Transportation costs. A close examination of the factors in figure 13-1 will show some obvious, and some not-so-obvious, ways by which the packaging and packing of articles play an important role in the overall determination of transportation costs. These factors should be considered when selecting packaging materials and processes.

(1) *Weight per cubic foot.*

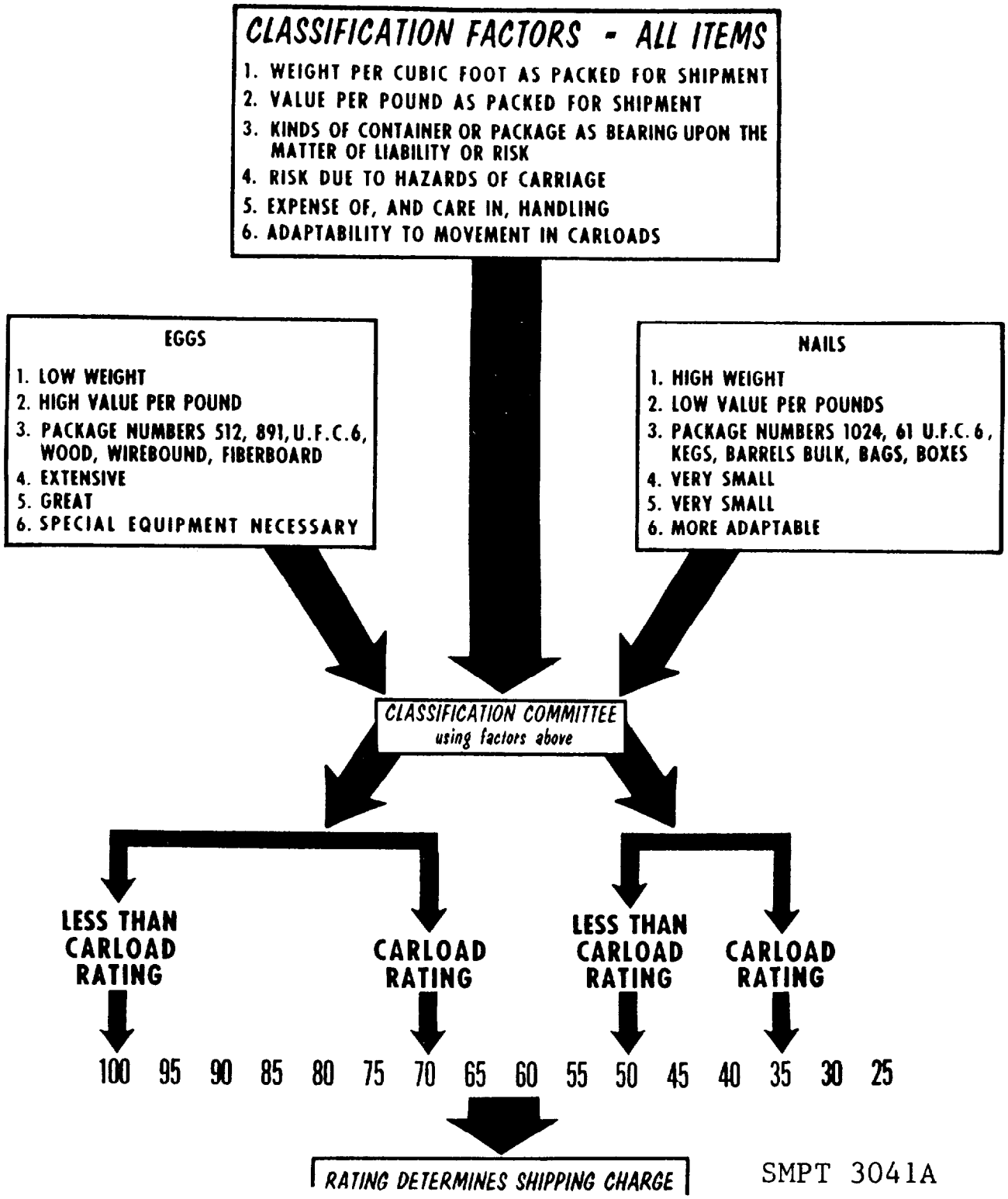


FIGURE 13-1. FACTORS IN TRANSPORTATION COSTS

(*a*) A railroad car or motor truck loaded to its capacity in pounds can earn more revenue than on which is loaded to only a fraction of that capacity. Similarly, light, bulky items take up more earning space than items which are heavy in proportion to the space occupied. The only way the carrier can earn enough revenue to cover the cost of transporting the light, bulky items is to give them a higher rating.

(*b*) The same principle applies to the prac-

tice of giving higher ratings to articles which are "set up" (i.e., assembled in their final form) in comparison to the lower ratings given to the same articles when "knocked down" or "nested" (inclosed one within another as pails, bowls, etc.).

(c) From this viewpoint, a reduction in the size of the shipping container will help reduce the overall bulk of the item as packed for shipment.

(2) *Kinds of container or pack as bearing upon the matter of liability or risk.*

(a) The better an item is protected and cushioned against damage during shipment, the less risk the carrier takes in accepting the item. There are many cases where the same article has different ratings when packed in different kinds of containers. For example, sulfuric acid has four ratings in addition to the rating for shipping by tank car.

Description	*LCL ratings*	*CL ratings*
In carboys, other than package 800	100	40
In glass in barrels or boxes	70	40
In package 800	70	35
In metal barrels	60	30

(b) It should be pointed out that the Uniform Freight Classification contains a section which identifies and describes hundreds of different types of packages; in the above case, package 800 is a special type of carboy. Where alternative containers are offered, the carriers encourage the use of the more protective containers by assigning them the lowest ratings.

(3) *Risks due to hazards of carriage.* In addition to the kind of container used, it is generally found that items which are inherently subject to being easily damaged are given higher ratings than the more rugged, sturdy items. Ratings on those items which are quite easily damaged should be lowered either when improvements are made in the design of the item or when new packaging materials and methods are developed to afford better protection to the item. In addition, carriers also take into consideration the possibility of the item damaging other freight or equipment.

(4) *Expense of, and care in, handling.* Most items which are considered as a high risk due to their susceptibility to damage also need greater care in handling; this may require either more time in handling or special equipment for handling. In either case, this means increased costs to the shipper. Once again, improvement in the designor these items and/or improvement in packaging and packing methods for these items should result in lower ratings.

(5) *Weight and cube of packaging and packing materials.* If minimum weights are met, it is quite obvious that the heavier the packed item and the greater the amount of space it takes, then the greater will be the cost for shipping the item. For example, if a delicate missile component weighs three hundred pounds and the shipping container weighs one hundred pounds, the entire shipping charges will be based on four hundred pounds at the rating applied to the missile component itself. Paragraphs 13-6 and 13-7 present more detail on programs to reduce tare weight and cube.

Section II. EFFECTS OF MODES OF TRANSPORTATION ON PACKAGING

13-4. General

a. Part two of this manual pointed out that the military service documents implementing packaging policy list several factors to be considered in determining appropriate levels of preservation and packing; one of these factors is the mode of transportation involved. Acquisition documents should, whenever possible, provide specific details on how items are to be prepared for shipment by a particular mode of transportation.

b. Contracting officers, packaging specialists, and design engineers should be familiar with the preservation and packing requirements specified in commercial carriers' regulations, statutory requirements, and military directives and regulations. Packaging personnel and design engineers should also be familiar with the hazards and handling conditions which items will encounter when shipped by various means of transportation.

13-5. How Modes of Transportation Affect Packaging

a. Some general advantages and disadvantages of the various means of shipping material are presented in paragraph 13-2 through 13-4. There are, however, other factors which should be considered in determining how much protection an item needs during shipment.

(1) *Rail transportation.*

(a) Railroads are excellent for mass movement of heavy materials and reach almost all communities and industrial areas. Closed cars afford protection against the elements, and special cars afford heat, refrigeration, or ventilation as may be desired. On the other hand, freight is often subjected to damage from shock due to "bumping" at freight yards and sudden starts and stops; constant vibration during shipment is another cause of damage. All shippers and receivers do not have railheads; this means additional handling in

transferring freight by truck to the rail terminal is required.

(*b*) Two widely used innovations to rail transportation are containerized freight shipments and trailer-on-flatcar (TOFC) or "piggyback" service (fig. 13-2). Both types of service tend to speed up service and decrease the amount of freight handling required.

(*c*) Railroads also offer in-transit stopoff privileges, a special service whereby the shipper may have a shipment stopped at one or more points between the origin and final destination for storage or further processing and then reshipped to destination at the lowest rate in effect from the initial point of origin to the final destination plus a small transit fee. This would permit purchase of material from a contractor, shipping it to another place for any additional processing or packaging and packing, and then forwarding it to its destination.

(*d*) When it is considered necessary to prescribe particular carloading methods in invitations for bids and requests for proposals covering the purchase of supplies, or in related transportation or packaging specifications, the required methods shall be specified in adequate detail. There are numerous detailed loading plans designed and tested for use with shipments of ammunition, explosives, or other dangerous articles.

(2) *Highway transportation.* For shorter distances, motor trucks often provide faster and more convenient service than railroads. Motor trucks usually provide door-to-door service with little or no interchange of freight between carriers; this reduces the possibility of loss or damage resulting from repeated loading and unloading. The motor truck, moving as an independent unit, and therefore, not subject to the rigors of coupling and humping as are railcars, permits less costly expenditures for loading and unloading, packing, dunnage, and bracing. The fact that trucks are not loaded as heavily as railcars, also contributes to the existence of less stringent and costly packing requirements. On the other hand, in order to provide door-to-door service, particularly in oversea areas, trucks must frequently use secondary and rough roads, thus increasing the chance for damage to occur.

(3) *Water transportation.*

(*a*) Although water transportation is usually the cheapest means for shipping material, it is also usually the most widely used method for shipping most of our military material to oversea areas. As long as cargo aboard ship remains secured, there is relatively little shock or impact involved, but this favorable condition often is offset by the fact that some other means of transportation are usually involved in getting freight from the shipper to the water terminal and then from the water terminal to the consignee; this, in turn, increases handling costs and the possibility of damage. Depending on how and where material is stored, water and salt spray could cause considerable damage.

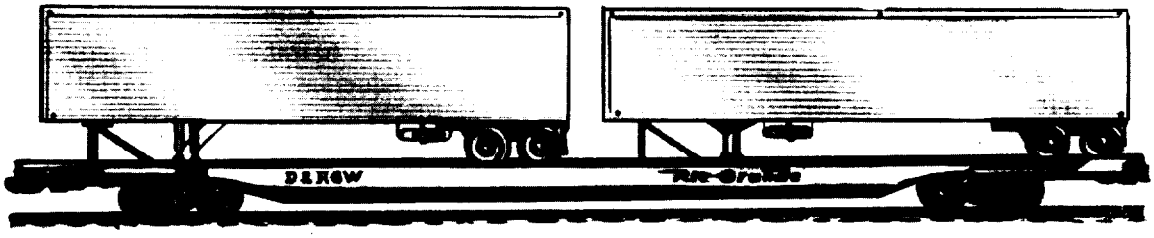
(*b*) Expedited handling is being facilitated by the use of such equipment as Container Express (CONEX) containers, SEAVANS, and roll-on/roll-off trailers. In these cases, consolidated shipments for a particular area are loaded and unloaded as one unit.

(*c*) Among the more promising developments in transportation are the container ships. Specially built containers (SEAVANS), which can be loaded on flatcars, attached to trailer chassis for over-the-road hauling, and loaded aboard ship, reduce the amount of handling of the individual packages to a minimum.

(4) *Air transportation.*

(*a*) Care must be taken that containers are not used which will be damaged by internal air pressure at high altitudes and that cushioning materials will not freeze when exposed to the low temperatures found at high altitudes. While very little protection is required during air shipment, it must be kept in mind that, in most cases, material must be carried to and from air terminals by some other means of transportation; once again, this involves more handling and greater risk of damage. In this sense, preparation of freight for air shipment is a paradox—on one hand, it is desirable to have as little weight and cube as possible; on the other hand, once the material is removed from the airplane, it may require a great deal of protection during the remaining part of the trip to its final destination.

(*b*) Many activities publish policy documents and guidelines for determining which levels of protection and what methods of preservation should be applied to items depending upon destination, means of transportation, and intended use. Such documents are not intended to serve as hard and fast rules in all cases; instead, known conditions to be encountered and information obtained from previous experience should be considered in applying such guidelines.



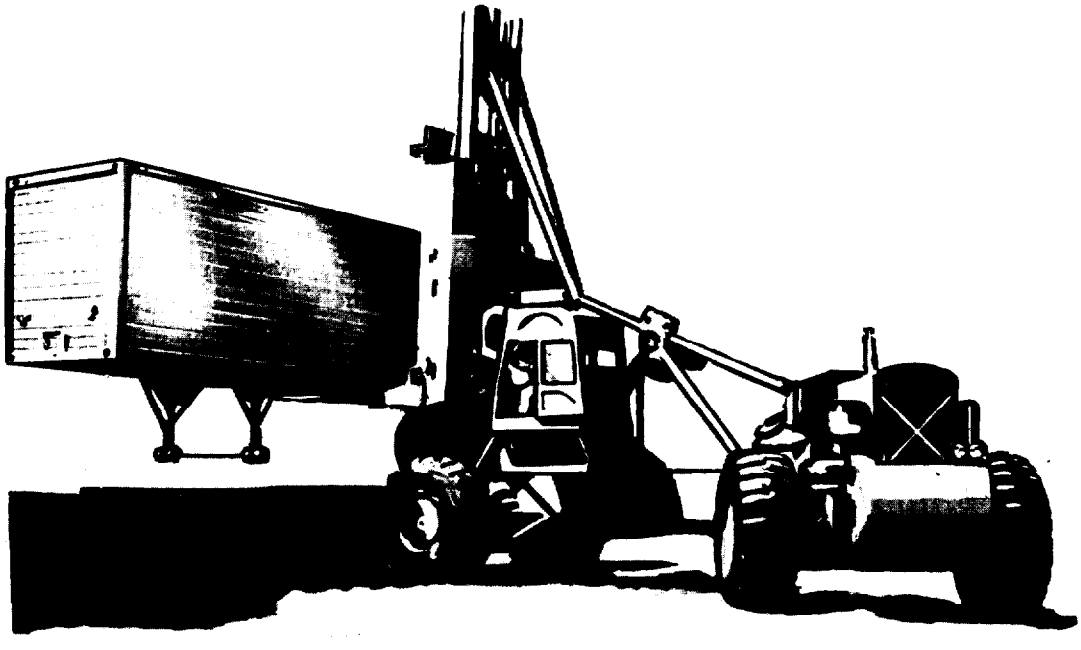


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FIGURE 13-2. TRUCK TRAILER PIGGYBACK AND FORKLIFT

Section III. TARE WEIGHT AND CUBE REDUCTION

13-6. Excessive Preservation and Packing

There is a continuing need to make every effort to reduce the weight and cube of packaging materials and shipping containers to the maximum, without sacrificing protection during handling, storage, and transportation. Ecological considerations also make this reduction imperative.

a. Reduction of Tare Weight.

(1) In consonance with Department of Defense policy of providing adequate protection at minimum cost, the military departments are constantly striving to reduce the weight of containers and materials used for preservation and packing. If items are packed in containers which are larger and heavier than necessary, these packs not only produce higher transportation costs, but also detract from storage and handling efficiency.

(2) Experience has shown that lighter containers can be substituted for heavier ones in a high percentage of cases to achieve important weight,

cube and cost reductions without sacrificing needed protection.

(3) It should also be kept in mind that the freight rate applied to the item also applies to the packing material. Thus, if a light, bulky, expensive, and extremely fragile item has a rating of two hundred, the weight of the packaging material is also computed at a rating of two hundred even though the container is made of heavy, dense, and inexpensive material.

(4) One military activity found that the tare weight average was running about 20 percent of the gross weight; in terms of the 70 million dollars a year that was being spent for transportation of packed products, this meant 14 million dollars for shipping the "shipping materials" consisting of containers, cushioning, and similar materials. It was estimated that every one percent reduction in tare weight average would save $700,000 in transportation charges. The smaller the percentage of tare weight to gross weight, the greater the quantity of the commodity that can be shipped for the same cost.

(5) Personnel in the packaging, transportation, and design areas must keep current with new and improved materials which are constantly appearing on the packaging scene. These materials must be included in current specifications and requirements to achieve economies without sacrificing performance. There must be closer control over procurement which permits optional selection of a wide variety of containers.

b. Reduction of Cube.

(1) Reduction in cube or volume of an item packed for shipment, which often occurs with a corresponding reduction in tare weight, will save valuable shipping space and storage space, as well as bring about greater ease in handling.

(2) A reduction in cube can be brought about more readily than is commonly realized. For example, a reduction of one-half inch in each dimension of a 6-inch x 6-inch x 6-inch unit container will result in a cube reduction of approximately 23 percent. On a larger scale, if a container 2 feet x 2 feet x 4 feet were reduced 1 inch in each dimension, a savings of 1.6 cubic feet would be effected.

13-7. Exceptions

a. Care must be taken not to apply tare weight and cube reduction programs to all items indiscriminately. Although excessive preservations and packing is undesirable from the standpoint of increased transportation, material, and storage costs, it must be remembered that any reductions must be made without sacrificing protection required during handling, storage, and transportation. Inadequate packaging which permits military items to be damaged or to deteriorate during shipment and storage is more than costly; it could be catastrophic if such items were required on the field of combat.

b. There may be times when preservation and packing appear to be excessive but actually are not. Some examples are—

(1) Special protection for items that are prone to pilferage or are of a sensitive, classified, or hazardous nature.

(2) Ammunition, explosives, and other dangerous materials when packaged in accordance with approved drawings, specifications, and regulations.

(3) Materials and containers exceeding protective requirements where no additional costs are incurred and the specified weight and dimensions of the package design are not exceeded.

c. There will be other instances where excessive preservation and packing is not corrected because of cost factors. Some examples are—

(1) Use of available materials and containers which exceed protective requirements where otherwise unacceptable delay or excessive procurement costs would result from procurement of prescribed materials. However, this should not justify continued use of such practices.

(2) Shipments of material previously packaged at a higher level of protection than required, but where repackaging to reduce the level would result in additional cost or unacceptable delay in shipment.

(3) Addition of nonreinforcing skids to heavy boxes, which increases tare weight and cube but reduces handling costs through facilitating use of forklift trucks, application of slings, and other necessary material handling devices.

Section IV. PACKAGING IMPROVEMENT PROGRAM

13-8. General

a. Physical damage to freight will probably never be completely eliminated. Even if the Government made recovery for all losses or damage as a result of inadequate packaging and handling, there still would be areas in which complete reimbursement would be impossible. Some of these areas are—

(1) *Administrative costs.* Preparation of required forms to claim damage is approximately $50.

(2) *Delay of schedules.* Critical programs may

FIGURE 13-3. DAMAGE DUE TO IMPROPER PACKAGING (SF 364)

be delayed because of delivery of required materials in unserviceable conditions.

b. In order to improve packaging and to avoid repetition of deficiencies which have already caused damage, or may result in damage to material due to improper packaging, the military departments have set up a program whereby corrective action may be taken to prevent losses.

13-9. Improving the Packaging Effort

a. Annually, mistakes and carelessness in the packaging effort throughout the Department of Defense take a heavy toll in dollars and in other ways affect the supply system (fig 13-3). Prudent management, therefore, dictates methods to determine the cause of packaging deficiencies, to correct them, and so far as possible, to prevent their recurrence.

b. To this end the components of the Department of Defense have established a joint program to reduce losses through a regulation titled, Reporting of Item and Packaging Discrepancies, Designations for the publication are DLAR 4140.55/AR 735-11-2/NAVMATINST 4355.73/AFR 400-54/MCO 4430.3E. Until recently, packaging discrepancies were reported under the DD Form 6 Packaging Improvement program but these have been combined into one reporting system that also includes shipping-type (item) discrepancies and discrepancies in parcel post shipments.

c. Under the new program, the reporting instrument is Standard Form 364, Report of Discrepancy. Generally, a packaging deficiency is any unsatisfactory condition caused by improper packaging in which the package is subject to loss, delay or damage and the estimated or actual cost to correct the condition exceeds $50. Specific examples include—

(1) *Preservation*

(*a*) Inadequate or omitted preservation.

(*b*) Inadequate or omitted container.

(*c*) Corrosion.

(*d*) Contamination.

(*e*) Blocking or cushioning omitted or inadequate.

(*f*) Excessive preservation or waste space on contractor shipments.

(2) *Packing.*

(*a*) Container overloaded.

(*b*) Inadequate container.

(*c*) Inadequate closure of container.

(*d*) Broken, loose, or inadequate reinforcing bands on container.

(*e*) Cushioning and/or blocking inadequate or omitted.

(*f*) Unitizing methods inadequate or omitted.

(3) *Marking.* Identification markings incorrect, incomplete or omitted, to include National or NATO stock number, item description, quantity and unit of issue, contract or purchase number, level of protection and date, gross weight and cube, shelf life, and serial number.

d. Effectiveness of the program depends upon conscientious reporting of deficiencies to a series of control points and intermediate offices operated by the Department of Defense components. Details are given in the regulation.

e. The Standard Form 364 assists management to evaluate and improve supply operations and reporting performance.

(1) Use in reporting substandard performance for packaging discrepancies is authorized and actually encouraged.

(2) Discrepancies should be monitored by the individual Service or agency and any trends noted by analyzing feedback data.

f. One DOD component, Army, encourages direct reporting of packaging deficiencies. This is handled by the US Army Materiel Command's Packaging, Storage, and Containerization Center (AMCPSCC) at Tobyhanna Army Depot, Tobyhanna, PA. The caller informs AMCPSCC of the stock number of the discrepant item, item identification, who shipped the item, and the packaging deficiency. AMCPSCC follows through on the report to satisfactory conclusion.

Section V. EFFECT OF MILSTRIP AND MILSTAMP ON PACKAGING

13-10. Background

a. The current military supply system is based upon years of experience, research, and analysis of our military capabilities and needs at the present time, as well as in the future. It is designed to be a simple, flexible, responsive, efficient, and economic system limited only by our existing means of communications, transportation, and data processing. As changes in these systems take place, and as changes in military concepts and capabilities take place, so will changes in the military supply system occur. This supply system is not a static system, but a dynamic one, and those who work with any part of it must realize this and be capable of making any necessary adjustments as change takes place.

b. There no longer seems to be a place for the supply sergeant who has one of everything stored in a supply room, even if there were only one request for it every 4 of 5 years. Instead of depending upon a big stockpile, using units are relying more upon rapid communications and expedited transportation to get their supplies; only those items which are most frequently demanded are carried, and these generally make up a very small percentage of all the items in the supply system today.

c. To understand the impact of today's supply system on packaging, it is necessary to be aware of three components of this system; these are the Uniform Materiel Movement and Issue Priority System (UMMIPS), the Military Standard Requisitioning and Issue Procedures (MILSTRIP), and the Military Standard Transportation and Movement Procedures (MILSTAMP).

13-11. The Uniform Materiel Movement and Issue Priority System

a. In 1962, the Department of Defense established this issue priority system to assure priority handling of a requisition throughout the entire logistic system, based on the requisitioner's mission and on the military essentiality of the item.

b. The mission of each military customer is designated as one of five mission categories; the designator, indicated by a Roman numeral is called a "force/activity designator" (F/AD). Briefly, the five force/activity designators are:

F/AD	*Description—*
I	Forces in combat and forces designated by the Joint Chiefs of Staff.
II	Forces positioned and maintained in a state of readiness for immediate combat direct combat support units.
III	Forces maintained in a state of readiness to deploy for combat and other activities essential to combat forces.
IV	Active and Selected Reserve forces which are planned for employment in support of approved joint war plans and support activities essential to such activities.
V	All other forces.

c. The military essentiality of an item in relation to the mission of the unit is expressed by a capital letter known as the "urgency of need

designator" (UND). The three urgency of need designations may be briefly described as follows:

(1) *UND A.*

(*a*) The item(s) required is one without which the force activity concerned is *unable* to perform assigned operational missions or tasks or such condition is imminent, or

(*b*) Emergency requirements for primary weapons and equipment and functional materiel required to effect emergency repairs to primary weapons and equipment to keep them operational.

(2) *UND B.*

(*a*) The item(s) required is one for immediate use, the lack of which is *impairing* the operational capability of the force/activity concerned. Assigned operational missions and tasks can be accomplished but with decreased effectiveness and efficiency, or

(*b*) Materiel is required to effect emergency replacement or repairs to auxiliary equipment systems. The force/activity can operate only temporarily as an effective unit, or

(*c*) Materiel is required for immediate end-use to effect replacement or repair of essential physical facilities of an industrial/production activity and without which the capability of the activity to perform assigned mission is *impaired.*

(*d*) Materiel is required to preclude an *anticipated* work stoppage at industrial/production activities manufacturing, modifying or maintaining mission-essential materiel.

(3) *UND C.*

(*a*) Materiel is required for on-schedule repair/maintenance/manufacture or replacement of all equipment.

(*b*) Materiel is required for replenishment of stock to meet authorized stockage objectives.

(*c*) Materiel is required for purposes not specifically covered by any other Urgency of Need Designator.

d. Through the combination of the assigned Force/Activity Designators and the appropriate Urgency of Need Designator, a Priority Designator can be ascertained by the requisitioning activity. Table 13-1 indicates the appropriate Arabic number Priority Designators derived from a combination of a given Roman numeral Force/Activity Designator with one of the three alphabetical Urgency of Need Designators. It should be noted that each force/activity can choose normally from only three Priority Designators.

Table 13-1. Derivation of Priority Designators
(Relating Force/Activity Designators to Urgency of Need)

F/AD	Urgency of need designator		
	A	B	C
I	01	04	11
II	02	05	12
III	03	06	13
IV	07	09	14
V	08	10	15

Priority Designator *03* will be used by all activities for medical or disaster supplies or equipment required immediately for:

Prolonging life, relieving avoidable suffering, or expediting recovery in case of injury, illness or disease.

Avoiding or reducing the impact of epidemics or similar potential mass illnesses or diseases when in professional opinion the probability is imminent.

Priority Designator *03* will be used by all activities for emergency supplies or equipment required immediately for controlling civil disturbance, disorder or rioting.

Priority Designator *06* will be used by all activities for emergency supply of individual and organizational clothing required immediately to provide a minimum of essential clothing to active duty military personnel who are actually without the clothing required.

13-12. Military Standard Requisitioning and Issue Procedures (MILSTRIP) AR 725-50

a. MILSTRIP established uniform requisitioning and issuing procedures with a priority system of supply to satisfy a military requisitioner's needs based on an issue priority designator. MILSTRIP documents prescribe codes and procedures required by the system. Requisitions are normally prepared on EAM punched cards and transmitted electrically to the supply source; by the use of automated data processing equipment, the requisition is processed and instructions prepared to ship the material.

b. MILSTRIP also sets maximum time limits for the processing of requisitions and issuing of material. As an aid in meeting these requirements, requisitions are classified into "issue groups" based on the issue priority designators as follows:

Issue priority designator (IPD)	*Issue group*
01-03	1
04-08	2
09-15	3

c. By using the time limits set forth by MILSTRIP, the date by which material should reach the requisitioner is established. This is the "standard delivery date" (SDD); it is expressed as a three-digit number which indicates the numeric consecutive day of the calendar year. For example, 26 September is written 269. Unless otherwise indicated by the requisitioner the priority delivery date is perpetuated on MILSTRIP documents as the "required delivery date" (RDD).

d. The maximum processing time limits for CONUS requisitions and oversea requisitions are shown in table 13-2.

Table 13-2. Maximum Order and Shipping Time

Time segment	Time standard (in calendar days) for priority designators		
	01-3	04-08	09-15
A. Requisition Submission	1	1	2
B. Passing Action	1	1	2
C. ICP Availability Determination	1	1	3
D. Depot/Storage Site Processing	1	2	8
E. Transportation Hold and CONUS Intransit to CONUS Requisitioner Canada, or to POE	3	6	13
F. Oversea Shipment/Delivery:			
1. To Alaska, Hawaii, South America, Caribbean, or North Atlantic	4	4	38
2. To Northern Europe, Mediterranean, or Africa	4	4	43
3. To Western Pacific	5	5	53
G. Receipt Take up by Requisitioner	1	1	3

13-13. Military Standard Transportation and Movement Procedures (MILSTAMP) DOD 4500.32-R

a. MILSTAMP provides policies and procedures needed to manage and control the movement of materiel through the Defense Transportation System (DTS). The regulation complements both the Uniform Materiel Movement and Issue Priority System (UMMIPS) and Military Standard Requisitioning and Issue Procedures (MILSTRIP). MILSTAMP:

(1) Sets responsibilities for shipping, clearance, terminal and receiving activities.

(2) Provides advance information to optimize use of transportation resources.

(3) Establishes standard documentation procedures, data elements, and codes.

(4) Provides intransit data to evaluate transit time standards.

b. MILSTAMP transportation priorities to be used in the movement of MILSTRIP material by all modes of transportation will be assigned to agree with the MILSTRIP issue group as follows:

MILSTRIP Issue group	*MILSTRIP Issue priority designator*	*MILSTRIP Transportation priority*
1	01 through 03	1
2	04 through 08	2
3	09 through 15	3

c. Although the mode of transportation to be used will be governed by such factory as the transportation priority, required delivery date (RDD), weight and size of shipment, nature of material, cost of transportation, distance to be shipped, and modes of transportation servicing the consignor and consignee, the following guidelines have been established by some military activities.

(1) *Transportation priority 1.* The preferred mode is airlift.

(2) *Transportation priority 2.* The mode of transportation selected will assure delivery within the requirements of the RDD.

(3) *Transportation priority 3.* The material will be moved via ordinary or expedited modes of transportation. Movement by airlift will be only under conditions where timely surface transportation is not available to oversea areas or when the only access to the consignee is by air transportation.

(4) Transportation priorities 1 and 2 must be challenged with the customer prior to selecting a mode of transportation.

CHAPTER 14
STORAGE AND PACKAGING

Section I. FUNCTION OF STORAGE AND ITS RELATION TO PACKAGING

14-1. Storage Defined

a. Uniform storage and materials handling policies, procedures, and responsibilities for use by Department of Defense are contained in DOD Regulations 4145.19-R-1 Storage and Materials Handling. Storage may be defined as the "keeping or placing of military supplies and equipment in a warehouse, shed, or open area." Storage continues the receiving operation and precedes the shipping or issuing operation.

b. Storage may be thought of as the period during which materiel lies dormant awaiting a need for its use to be generated by the logistical system. During the dormant period, unknown and unsuspected deterioration and damage may occur if material is improperly preserved, packed, or handled. The packaging materials themselves may deteriorate during a storage period and thus fail to give required protection.

14-2. Relation of Storage to Packaging

a. General

(1) The service document implementing DOD packaging policy lists various factors influencing the choice of the appropriate level of preservation and packing. The document states that the proper application of levels depends upon current information relative to the shipping, handling, and storage conditions to which item will be exposed. Prior experience should also be taken into consideration.

(2) Whenever possible, commodity managers should furnish level of protection information to contracting officers when directing procurement, and to storage and distribution activities when directing distribution or reprocessing of materiel. This information should be based on destination, mode of transportation, type of storage, length of storage, and anticipated redistribution.

(3) Although this chapter will deal primarily with packaging and storage, it must be remembered that packaging levels must usually be considered in relation to the sum total of the hazards to be encountered during shipment, handling, and storage.

b. Types of covered storage facilities. There are various types of storage facilities that afford varying degrees of protection to materiel. The types of storage facilities are —

(1) *General-purpose warehouse.* A general-purpose warehouse is constructed with roof, side walls and end walls and may be heated or unheated.

(2) *Refrigerated warehouse.* A refrigerated warehouse is constructed much the same as a general-purpose warehouse, except that it is usually divided into two distinct parts. One temperature is controlled between 36°F and 46°F. The other part is freeze space in which the temperature is controlled below 32°F.

(3) *Flammable storage warehouse.* This type of facility is constructed of noncombustible materials having a roof, side walls, and end walls. It has fire walls with a 4-hour fire-resistance rating. The main source of protection is an alarm reporting system and automatic deluge-type sprinklers.

(4) *Above-ground magazine.* This structure has a roof, side walls and end walls and is designed for the storage of ammunition and explosives. Above-ground magazines are built of fireproof materials and are well ventilated to lessen the danger of explosion.

(5) *Earth-covered magazine.* A popular type is the igloo used to store ammunition and high explosives. It is generally constructed of masonry with an arched roof covered with earth. The arch is a safety feature. Should an explosion occur, the highest point of the arch, being the weakest part, will collapse first, thereby lessening damage.

(6) *Controlled humidity warehouse.* Any type of general-purpose warehouse can be operated with controlled humidity if properly sealed and conditioned. This type facility, with humidity control equipment to keep relative humidity (RH) at 50 percent or less, provides the most efficient protection against corrosion and deterioration. Certain geographically located areas sustaining an ambient relative humidity of not over 50 percent RH within general-purpose warehouses may qualify as an equivalent controlled humidity area. Such qualification, however, must be approved by higher authority.

(7) *Dry tank.* Dry tanks are constructed of metal sections and a concrete floor. They may have temperature and humidity controls and are built at ground level. Because of their size and shape, dry tanks have no operating aisles for using materials handling equipment.

(8) *Transitory shelter.* This facility is a prefabricated, sectional metal structure, usually with complete sides and ends but without utilities.

(9) *Shed.* A shed is a roofed structure without completed sidewalls and endwalls. Sheds are used for materiel that requires ventilation or materiel that does not require complete protection from the weather.

c. Types of open storage. This type of storage provides little or no protection from the weather. There are two categories of open storage.

(1) *Open improved.* This is storage space that has been graded and surfaced with concrete, tar or asphalt, crushed stone or gravel, or other suitable topping.

(2) *Open unimproved.* This is a storage area that has not been surfaced with some suitable material.

d. Packaging and types of storage. Materiel must be adequately protected from environmental conditions and the elements by the means of proper storage facilities, preservation, packing or a combination of any or all of these. The type and length of storage anticipated should be one of the major factors in determining the degree of protection to be applied to material.

(1) Open storage has the advantage of being low in cost and usually readily available. However, because supplies are given little or no protection from the elements, more protection must be designed into the pack and carefully planned techniques of preserving vehicles and other equipment must be developed. Handling of material may be costly and time-consuming.

(2) Shed storage also costs little, is comparatively easy to construct and is well-suited for storage of supplies which need maximum ventilation and/or protection from rain, snow, or direct sunlight. Supplies must still be packed for protection from extremes of temperature, high humidity, and water vapor. Shed storage and open storage provide little protection against pilferage.

(3) Warehouse storage offers protection from the elements, affords better working conditions, better control over the storage area, and better supervision of working personnel. In many cases, depending on the geographical location, supplies and equipment must still be packed for protection against water vapor and possible condensation due to high humidity and extreme changes in temperature. The disadvantages include high cost of construction and upkeep, fire hazards, and scarcity of warehouses in many oversea theaters of operations.

(4) Controlled-humidity storage takes over many functions of packaging. This storage system in itself will protect material from the adverse effects of water vapor and extremes of temperature, so only physical and mechanical protection against the hazards of handling, and stacking is required. If protection against anticipated exposures during transportation and distribution is designed into the pack, it will virtually be "as good as new" when removed from storage. Disadvantages of controlled-humidity warehouses include cost of construction and upkeep and scarcity of facilities overseas, although various types of rigid and nonrigid hutments and inclosures may quite easily be constructed or converted to controlled-humidity storage areas.

(5) When controlled humidity storage space is not available, covered storage space and open storage space in that order of preference should be used pending availability of controlled humidity storage space. Materiel in open storage should be properly preserved and packed and provided temporary cover to the extent practicable. Temporary cover for small items may be gained through the use of MILVAN and CONEX containers. Representative types of equipment not requiring controlled humidity include the following:

(*a*) Trailers, such as basic ammunition, cargo and semitrailers.

(*b*) Towed nonpowered equipment, such as rocket launchers and construction equipment.

(*c*) Pipeline.

(*d*) Fortification materials.

(*e*) Handtools, such as picks and shovels.

(6) Prepositioned caches of weapons and equipment and floating warehouses that are stationed where they might be needed in case of war illustrate the close tie between packaging and storage, for this equipment must be combat-ready upon call. Prepositioned sets of reserve equipment stored at depots will be segregated from regular depot stocks to the extent possible. Representative types of equipment requiring controlled humidity include:

(*a*) Vehicular and nonvehicular equipment having internal combustion engines; sensitive and delicate components; electrical and electronic components; components subject to deterioration from mildew, corrosion, or rot.

(*b*) Artillery and small arms.

(*c*) Tents, canvas and leather items.

(*d*) Aircraft.

(*e*) Instruments, electric and electronic equipment.

(*f*) Special protective equipment and medical supplies and equipment.

(*g*) Chemical warfare equipment and devices.

(*h*) Miscellaneous items, such as batteries and basic issue items of a sensitive nature.

(7) Commanders responsible for storage of prepositioned sets of reserve equipment will execute inspection, care, and preservation and packing techniques prescribed in applicable publications.

e. Economic factors involved in storage.

(1) Economic factors that influence a storage program are the cost of administration, operating labor, physical property acquisition, and maintenance.

(2) One important factor, which is very often neglected, is the feedback of storage experience to the cognizant services so that packaging specifications, standards, and other instructions can be revised. Such feedback information may indicate that packaging requirements can be reduced, thus affecting money savings. Excessive deterioration may indicate a requirement for a higher degree of protection, thus extending storage life and maintaining a larger number of items in ready-to-issue condition, with less subsequent loss due to deterioration.

(3) Another factor in the economic operation of storage facilities is a high degree of selectivity in assigning items to controlled-humidity storage. While it is recognized that most material, packed or unpacked, benefits from controlled-humidity storage, this space is limited and should be used wherever possible for the protection of valuable and critical equipment. In many cases, noncritical items are being afforded controlled-humidity storage, while critical materials are being stored in conventional space at the same stocking point. There is a limited amount of controlled-humidity storage in the supply system. To obtain the maximum benefit from this premium storage, judicious selection of items to be protected must be practiced by storage activities.

Section II. THE CARE OF SUPPLIES IN STORAGE PROGRAM (COSIS)

14-3. Purpose and Functions

a. After Government acceptance from contractors, depots are responsible for maintaining supplies and equipment in a serviceable, ready-for-issue condition during the length of time the materiel is in storage. During routine warehouse operations, such as stock-picking, storing, rewarehousing, conducting inventories and location surveys, etc. storage personnel are responsible for reporting condition of supplies. However, it is also necessary to inspect the contents of packs to assure that the protection designed into the pack has been maintained and that deterioration is not occurring. The Care of Supplies in Storage Program (COSIS) (formerly referred to as "maintenance in storage" and "care and preservation") has been developed to assure required supplies and equipment are maintained in a serviceable condition through inspection and action taken to restore the supplies to ready-for-issue condition.

b. Because of the magnitude of the COSIS Program, the military services prepare appropriate instructions to provide for the care of materiel for which they have the prime responsibility for receipt, storage, and issue. The major functions of the program are:

(1) Cyclic inspection.
(2) Preservation and packing.
(3) Minor repair.
(4) Reporting.

14-4. Procedures

a. Each DOD component has its own approach to the care of supplies in storage. However, the basic element in all approaches is a cyclic inspection program. This inspection may be of the following types.

(1) *Visual inspection.* Inspecting by visual means to observe the item and/or its container to detect deficiencies. This normally does not require disassembly of testing of items.

(2) *Technical inspection.* Inspecting visually and by other means which include gaging, disassembling, functional testing, and laboratory testing.

(3) *Spot inspection.* An inspection of a representative sample of the quantity of an item on hand to afford a reasonably accurate estimate of its true condition. The material must be of the same type and stored under similar conditions and manufactured or rehabilitated by the same facility.

(4) *Full inspection.* An inspection of quantities of the same type and stored under similar conditions and manufactured or rehabilitated by the same facility.

b. COSIS inspection stations may include facilities for cleaning and drying, preservation, packing, marking, and final acceptance inspection. Whenever possible deficiencies observed will be corrected concurrently with inspection to save handling costs and administrative action. Repacking of inspected items should be done in accordance with anticipated shipping demands whenever possible.

c. The length of time between cyclic preserva-

tion inspections is determined primarily by the type of storage. Although there will be variations due to individual storage conditions, workload, local climatic or seasonal peculiarities, previous storage experience, the following inspection intervals have been prescribed in the absence of more definitive instructions:

(1) Open storage inspection cycles of 6 months and shed storage of 12 months.

(2) Warehouse storage inspection cycles which will be at greater intervals than those required for open storage may vary from 24 to 30 months, the former prescribed for noncontrolled temperature warehouses and the latter for warehouses with temperature control. The level of protection may have a bearing on the inspection cycle; level A packs usually require less frequent inspections than level B packs. In a similar manner, the type of item and method of protection also affect the inspection cycle intervals.

(3) Controlled-humidity storage inspection cycles are 60 months.

Section III. PACKAGING LINE LAYOUT

14-5. Planning a Packaging Line

a. General. The military services and the Defense Logistics Agency maintain depots, or depot-type activities, which receive, store, and issue materiel. Each depot supports a packaging activity which has the following responsibilities:

(1) Repack stored items as required by results of periodic surveillance inspection.

(2) Package repaired and modified items for shipment or storage.

(3) Repack new receipts to protect against the hazards of storage and redistribution when original packaging is inadequate.

(4) Pack outgoing shipments.

b. Selection of location. One of the first things to be considered in establishing a packaging activity is the selection of a suitable site. Packaging lines will vary from one depot to another depending upon the space available, mission of the depot, the type of material being stored. Generally, however, there are several requirements which should be met whenever possible.

(1) The packaging activity must be central to receiving, shipping, and storage; this will reduce the amount of materials handling required. In addition, the packaging supervisors and specialists will be close by for consultation with the other segments of the depot on mutual problems.

(2) There must be room for future expansion. A packaging line confined to a corner of a warehouse cannot grow when needed nor can it be served efficiently.

(3) All required utilities, such as water, electricity, sewers, gas, and steam, must be provided.

(4) Transshipment facilities, such as truck docks and railroad sidings, should be in the approximate vicinity.

(5) A cleaning area is required which can be segregated from the other operations to prevent recontamination of cleaned parts, as well as for safety reasons.

c. Equipment. The equipment required by the packaging activity will be governed by the mission of the installation and by the volume of packaging required.

(1) Where there is small volume, manual operations will be feasible and economical. Mechanization of some processes, such as cleaning and drying, will reduce the number of man-hours required and will release labor for other tasks. Short packaging lines and standardized packs make planning and supplying of packaging materials in a simpler operation.

(2) Where large-volume operations are involved, cost studies should be conducted to determine what manual operations could be accomplished more economically through the use of automatic and semiautomatic equipment.

(3) In either case, the cleaning, drying, and preservative application processes can be mechanized for more efficient operation.

(4) Wherever large-scale packaging operations can be standardized, machines which automatically make, fill, and seal bags and machines which fill and seal cartons will make the packaging process faster, more efficient, and less costly.

d. Flow and continuity of operations (fig. 14-1). The flow of operations within the packaging area must be carefully planned to expedite the work and reduce the amount of materials handling involved. The minimum requirements for efficient depot packaging activity should include—

(1) A receiving and breakdown area where material is received, routed into the various lines where it is stripped of all packaging materials and placed in baskets.

(2) A process planning area, which is the most critical point of the entire packaging operation. Here the process planners—

(*a*) Determine required cleaning, preservation, and packing operations.

(*b*) Record all necessary information.

(*c*) Notify the packaging material storage

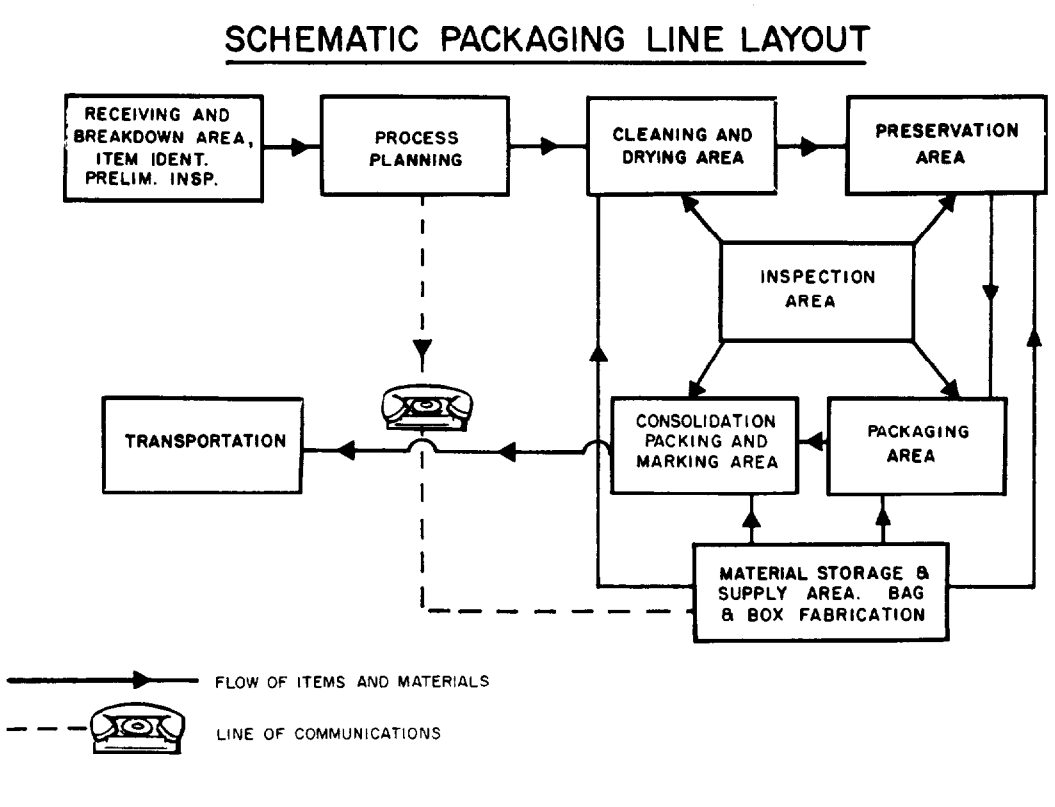


FIGURE 14-1. PACKAGING LINE LAYOUT

and supply area of requirements for packaging materials.

(*d*) Place the routing information on material.

(*e*) Divert material which cannot be packed manually to special areas (if the installation has mechanized packaging equipment).

(3) A packaging material storage and supply area, where packaging materials are stored, bags and fiberboard boxes fabricated, labels and bags printed with identification markings, and from which miscellaneous supplies, such as tape, adhesives, etc., are fed into the packaging line.

(4) The cleaning and drying area, which should be separate from the other packaging areas.

(5) The inspection area, which is another critical point in the packaging process. The inspector will—

(*a*) Approve the cleanliness of items and route them to the preservation area.

(*b*) Reject items which have not been acceptably cleaned and return them to the cleaning area for reprocessing.

(*c*) Route cleaned items that do not require a preservative directly to the unit packaging area.

(*d*) Inspect the completed packs for conformity to packaging area.

(6) The preservation area, where the required preservatives will be applied and excess allowed to drain. Here again the process may be mechanized if economically feasible.

(7) The unit preservation area, where the intimate wrap, cushioning, unit container, and identification marking are applied to the items. In this area, separate lines can be established for the different methods of preservation. Mechanized equipment may be used here. Also in this area, unit packs will be placed in intermediate containers if required.

(8) The consolidation and packing area, where the exterior containers are brought together with the material, packed, marked, and from here conveyed to depot storage or shipping.

(9) If there is sufficient need, a box fabrication area where boxes may be assembled from shooks, various types of fiberboard boxes fabricated, and other containers and crates assembled should be included as a section of the packaging department.

14-6. Programming the Work Schedule

a. In programming the work schedule for the packaging activity, there are certain priorities that must be honored and other factors that must be considered. In accordance with Military Standard Requisitioning and Issue Procedures (MILSTRIP) requirements, the requisitioning unit determines the priority status of needed items. The depot packaging activity must complete the required packaging within the time limit assigned to each of the priority indicators.

b. Workload from the COSIS program must also be part of the preservation and packing activity workload schedule. This will aid in having materiel in storage ready for shipment. Proper scheduling of the COSIS work allows one-time processing of larger quantities rather than frequent processing of small quantities at time of shipments.

c. Incoming receipts requiring preservation or packing prior to storage must also be considered in the scheduling of preservation and packing work.

14-7. Supplying the Packaging Line

a. One of the easiest ways to waste money is to have the packaging line workers standing idle because the material required for a particular job has not been delivered to the packaging line. Another cause of lost time is an uneven flow of material down the packaging line. To keep the packaging line operating efficiently, supervisors must plan and program each operation completely. This requires close supervision and complete cooperation between the various processing areas.

b. When the process planner makes out the work order for an item, the packaging requirements should be communicated immediately to the packaging material storage and supply area and to the box fabrication area, along with an approximate time the materials will be needed on the packaging line. The following actions should then take place.

(1) Wraps should be precut to size and bags cut and fabricated.

(2) Any required interior containers must also be fabricated and made ready for setup.

(3) The shipping containers must also be fabricated and made ready for use.

c. The prefabricated containers and packaging materials should be delivered to the proper stations along the packaging line before the items reach that stage of the processing, and in sufficient quantity so that workers will not have to be idle while awaiting stock replenishment. The flow of items through the packaging lines must also be controlled so that the operations can proceed efficiently and expeditiously. An intermittent flow of items will cause losses of labor time along the line. An overabundance of items will backup and jam any materials handling equipment, such as conveyors and monorails.

d. In order to keep the packaging line operating smoothly, efficiently, and economically, it is, therefore, necessary to deliver the items to the processing areas at a continuous rate no faster than the line can handle and to coordinate the supplying of packaging material with the progress of the item through the required processes.

14-8. Sources of Technical Information

a. The process planners, in order to do their job successfully, must have the packaging requirements for many items readily available. This library of packaging requirements must be kept current so that changes in packaging requirements can be implemented with little or no delay.

b. Information on packaging requirements is supplied to the process planner in many ways. Some of the more common sources of this information are—

(1) *Packaging data sheet.* This document, in each of its varied forms, should give the following information:

(*a*) Nomenclature, national stock number and part number (if any).

(*b*) The preferred cleaning and drying processes and contact preservative.

(*c*) The required method or submethod of protection.

(*d*) The quantity per unit pack, intermediate pack, and shipping container.

(*e*) The required preservation and packing materials, identified by class, type, and grade, as applicable.

(*f*) The dimensions of each wrap and container.

(*g*) Separate preservation and packing instructions should be given for levels A, B and C.

(2) *Coded packaging data.* Packaging information is often given in coded form according to MIL-STD-2073 (Packaging Requirement Codes). The Packaging Requirement Codes are used to express the requirements for cleaning, drying, preserving, wrapping, cushioning, and the level of protection, and other packaging requirements.

(3) *Other sources of information.* If no other sources of packaging information are readily available, the process planner should refer to applicable specifications and standards covering the item or the equipment of which the item is a component.

c. Lacking all these sources of information, the process planner must then apply his or her knowledge of packaging to devise adequate protection for the item; he or she must consider—

(1) The composition of the item—whether it is ferrous, nonferrous, or nonmetallic.

(2) The machine finish.

(3) The complexity and fragility of the item.

(4) The degree of protection required.

14–9. Summary of Packaging Line Operations

a. All depots, regardless of their mission, have a packaging function. The depot mission will dictate how large and complex this function must be. The packaging activity must be centrally located, supplied with all necessary utilities, and must be expandable.

b. Mechanized packaging should be utilized when it is economically feasible. In most cases, mechanized processes will be less costly and more efficient than manual labor.

c. The flow of operations within the packaging activity must be smooth and efficient if the operation is to proceed with little or no wasted labor time.

d. The process planner is the keystone of the depot packaging operation and must have immediate access to all required packaging instructions. Good programming and planning will result in a more efficient packaging line which, through improvements in packaging, will lead to lowered transportation and storage costs and to less materials handling.

Section IV. QUALITY ASSURANCE IN THE DEPOT

14–10. General

As the COSIS program is to verify the quality of material during its storage life and while it is leaving the storage system, the determination of conformance to established standards will be based on objective evidence of quality.

14–11. Storage Quality-Control Guidelines

The Department of Defense regulation titled Storage and Materials Handling (DOD Regulation 4145.19–R–1) covers general guidelines for a systems approach to a storage quality-control program. Supplementing and implementing instructions are published by various activities of the military services. The general guidelines cover the following areas:

a. Development and operational application of inspection instructions. Effective inspection instructions generally contain—

(1) *Identification of quality characteristics.* Quality characteristics of supply items may include the limits of corrosion or other deterioration, physical condition of the packaging, physical (e.g., hardness, tensile strength, capacitance) and chemical properties, dimensions, weight, and functional or performance characteristics.

(2) *Sampling procedures to be utilized.* Sampling inspection may be attributes, variables, or alternate procedures, based upon local conditions and/or types of material. Applicable military standards may be used by military services to develop sampling inspection procedures by attributes or variables. For most supplies in storage, sampling inspection by attributes will be utilized. As in any sampling plan, items must be selected without regard to their quality; that is, selection of samples shall be accomplished in a manner that will assure that each unit in the lot has an equal chance of being included. The choice of items to be drawn is to be made by inspection personnel even if the physical withdrawal is performed by other personnel.

(3) *Description of examination and testing procedures.* Detailed instructions should be provided for performing the prescribed examinations and tests, including descriptions of any required special gaging, measuring, and test equipment. The serviceability of supplies is generally measured by determination of the presence or absence of defects. Specialized definitions for storage defects are as follows:

(a) Preservation defects.

1. Major. Preservation which has permitted or will permit any degree of corrosion or deterioration of a critical surface or heavy corrosion or deterioration of a noncritical surface. Also, preservation which fails to provide necessary protection against physical damage which could prevent functioning at designated efficiency.

2. Minor. Preservation which has permitted light or moderate corrosion or deterioration of noncritical surfaces as long as use of the item is not affected. Also, preservation which does not conform to specification requirements but still provides adequate protection.

(b) Packing defects.

1. Major. Packing which will not give protection against physical damage during storage and shipment.

2. *Minor.* Packing which does not conform to specification requirements but still provides adequate protection against physical damage.

(c) Marking defects.

1. *Major.* A marking that lacks identification, could cause a wrong item to be shipped, could cause a misdirected shipment, a violation of statutory regulations, or could result in loss or damage to the item.

2. *Minor.* Defects which are unlikely to result in loss, damage, misdirected shipment of the item, e.g., improper or missing contract or requisition number, weight, or cube data, etc.

(d) Defects of a trivial nature. Defects of a trivial nature should not be considered as minor unless some reduction in the serviceability of the item can be expected prior to the next scheduled inspection. For example, dents and scratches that do not break the paint film are considered trivial deficiencies.

(e) Application. Defects shall be classified as major or minor if they can reasonably be expected to fall in these classes prior to the next scheduled inspection.

b. Review, analysis, and interpretation of quality control data. The objectives of the review, analysis, and interpretation of the quality-control data compiled from the records of inspection results include the following:

(1) The determination of current quality and serviceability.

(2) The determination of rates of deterioration and predicted storage life.

(3) The recommended disposition of the quality evaluated item as to disposal rework, overhaul, or retention as serviceable.

(4) The determination, where possible, of the factors responsible for quality deficiencies, such as design inadequacies, manufacturing errors, faulty procurement inspections, and environmental conditions causing deterioration.

c. Corrective action. The final action of a systematic quality control program is the corrective action taken to assure that materiel in storage is maintained in a ready-for-issue condition. Particular attention should be given to providing information to interested offices and activities on deficiencies found during quality control operations to preclude the recurrence of similar deficiencies in the future.

Section V. AUTOMATED MARKING AND MATERIALS HANDLING

14-12. Logistics Objective

a. The underlying thrust of all Department of Defense logistics actions is to reduce costs. Improving the productivity, timeliness, accuracy, and efficiency of logistics actions is fundamental to this objective.

b. Two developments that have significantly improved the cost-savings posture are automated marking and reading and automated materials handling.

14-13. LOGMARS

a. The Logistics Applications of Automated Marking and Reading Symbols (LOGMARS) Program, where implemented, is now producing substantial savings in such Government operations as wholesale and retail receiving inventory, and location, service store issue, and depot level maintenance.

(1) Bar coding is a way of communicating information encoded into the widths of bars and spaces. Bar code labels (fig 14-2) must be printed with extraordinary definition if proper interpretation is to take place. "Reading" is done by various kinds of scanning devices.

(2) The LOGMARS code is used by Defense contractors and DOD activities to mark unit packs, outer containers, and selected documents in the logistics field. (figs 14-3 and 14-4).

(3) Microcircuit Technology in Logistics Applications (MITLA) is another automatic identification technology that has also been included within the LOGMARS Program. This technology will be utilized in applications such as electronic bill of lading, configuration management, automated logbook, and container/vehicle control. MITLA provides the user with a means of storing fixed as well as variable data that can be updated as required for changing materiel conditions in the logistics system.

14-14. Cost Savings

a. Before LOGMARS was adopted it was tested in various roles for its cost savings potential. Not surprising, it was huge. Tangible savings in the DOD annually were said to approach $114 million. Of this, more than $100 million was saved in transactions involving depot level maintenance, ammunition inventory, and service store inventory and issue. Additional savings are projected as new applications arise.

b. LOGMARS produces intangible benefits as well.

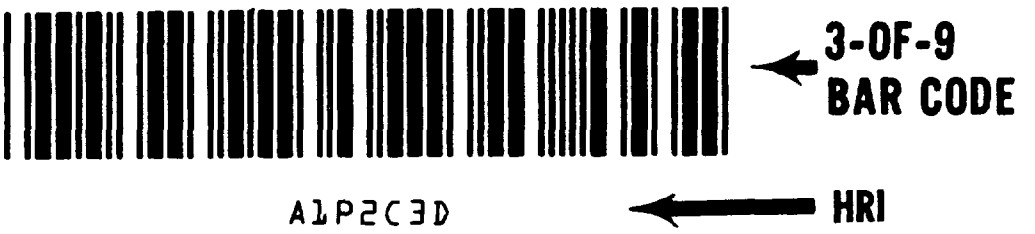
(1) Data entry accuracy, productivity, and customer satisfaction is increased by the elimination of human error.

STANDARD DOD SYMBOLOGY

THE 3-OF-9 BAR CODE,

WITH HRI (FULL ALPHANUMERIC)

PRINTED IN-THE-CLEAR



SMPT 3034A

FIGURE 14-2 STANDARD DOD SYMBOLOGY CONSITING OF BAR CODE AND HUMAN READABLE INTERPRETATION (HRI)

(2) As bar coding spreads throughout the DOD, increased benefits are expected from the integration of multiple functions, decreasing equipment costs, and reduced labeling costs.

(3) Automation of documentation and increased capability to electronically transmit data means less burdensome paperwork.

(4) Costs associated with training, transportation, and item tracking will be reduced.

14-15. Implementing documents

Three documents have been introduced to standardize symbols and procedures.

a. A proposed Department of Defense Instruction 4100.XX titled, Standard DOD Symbology for Logistics Applications, establishes policies and delineates responsibilities for use of the bar code within DOD. It mandates that the symbology will be incorporated into all logistics applications where it is technically and operationally feasible so long as it is cost-effective.

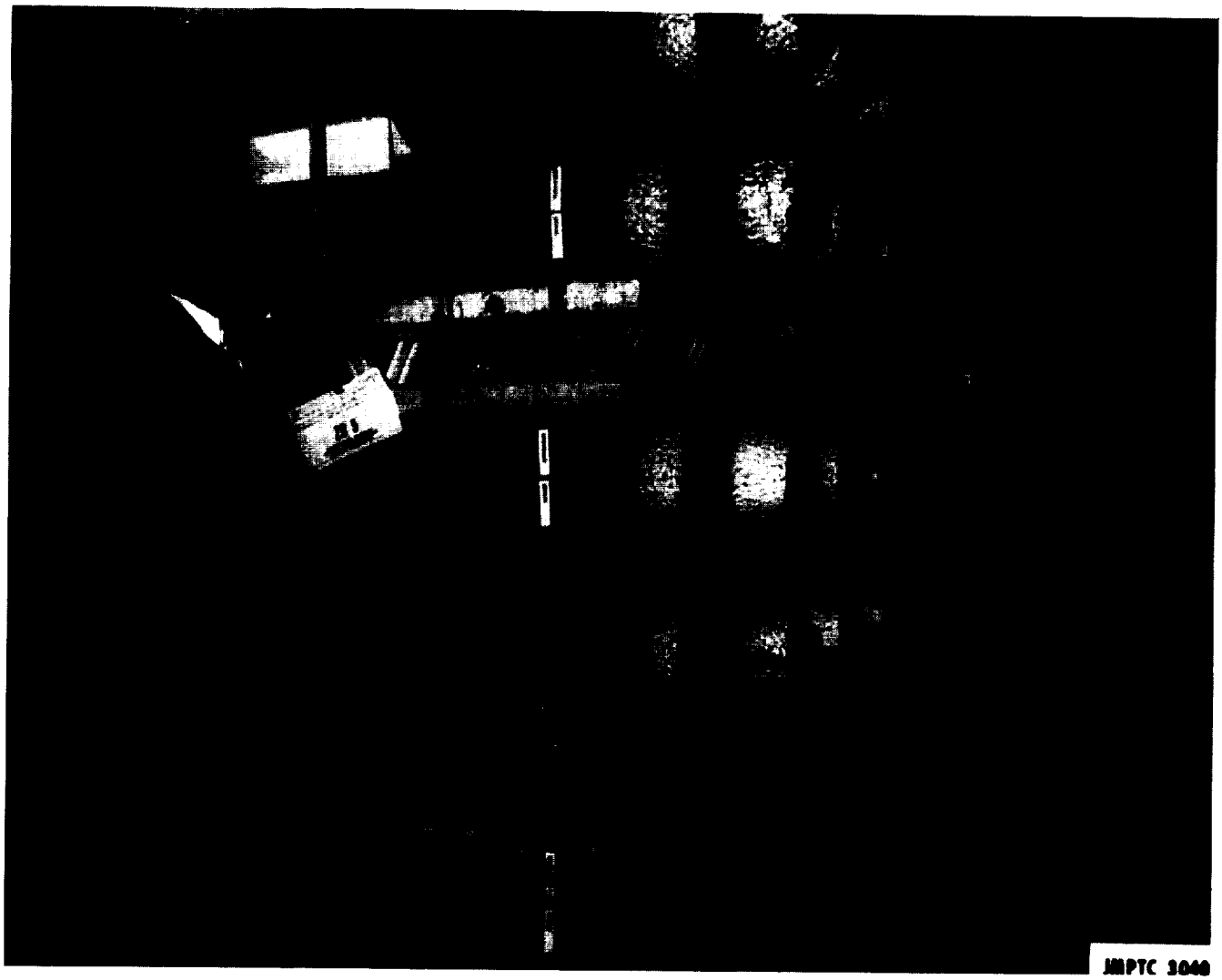
b. A military standard, MIL-STD-1189 titled, Standard Department of Defense Bar Code Symbology, specifies the technical parameters required for contractors or DOD activities to print a scannable bar code.

c. A separate appendix in MIL-STD-129, Marking for Shipment and Storage, contains guidance on data elements to be symbol marked and on orientation and placement of the bar-coded symbol on unit packs and outer containers.

14-16. Materials Handling

a. One approach to reducing storage and materials handling costs is the development of automated warehouses. Approximately 70 to 85 percent of military supply items are small enough to be kept in bin storage. This has prompted numerous studies on the possibility of mechanizing receiving and issuing actions. With modifications and additions, conventional warehouse conveyor equipment is converted to an automated materials handling system. In a nutshell, automated materials handling involves centrally operated, electronically controlled, electrically powered conveyors to move supplies received into or issued out of a storage warehouse.

b. There are many advantages to an automated materials handling system. Material is moved faster and easier. Such systems provide for scheduling work, resulting in a continuous, steady flow of material throughout the depot or center which permits more efficient use of manpower and equipment. The possibility of errors occurring is lessened because issue documents are carried along with the material. Requirements for such material handling equipment as fork trucks, tractors, trailers and pallet jacks are reduced. The system has the capacity for absorbing a rising workload and meeting emergencies with a minimum increase in manpower and facilities.

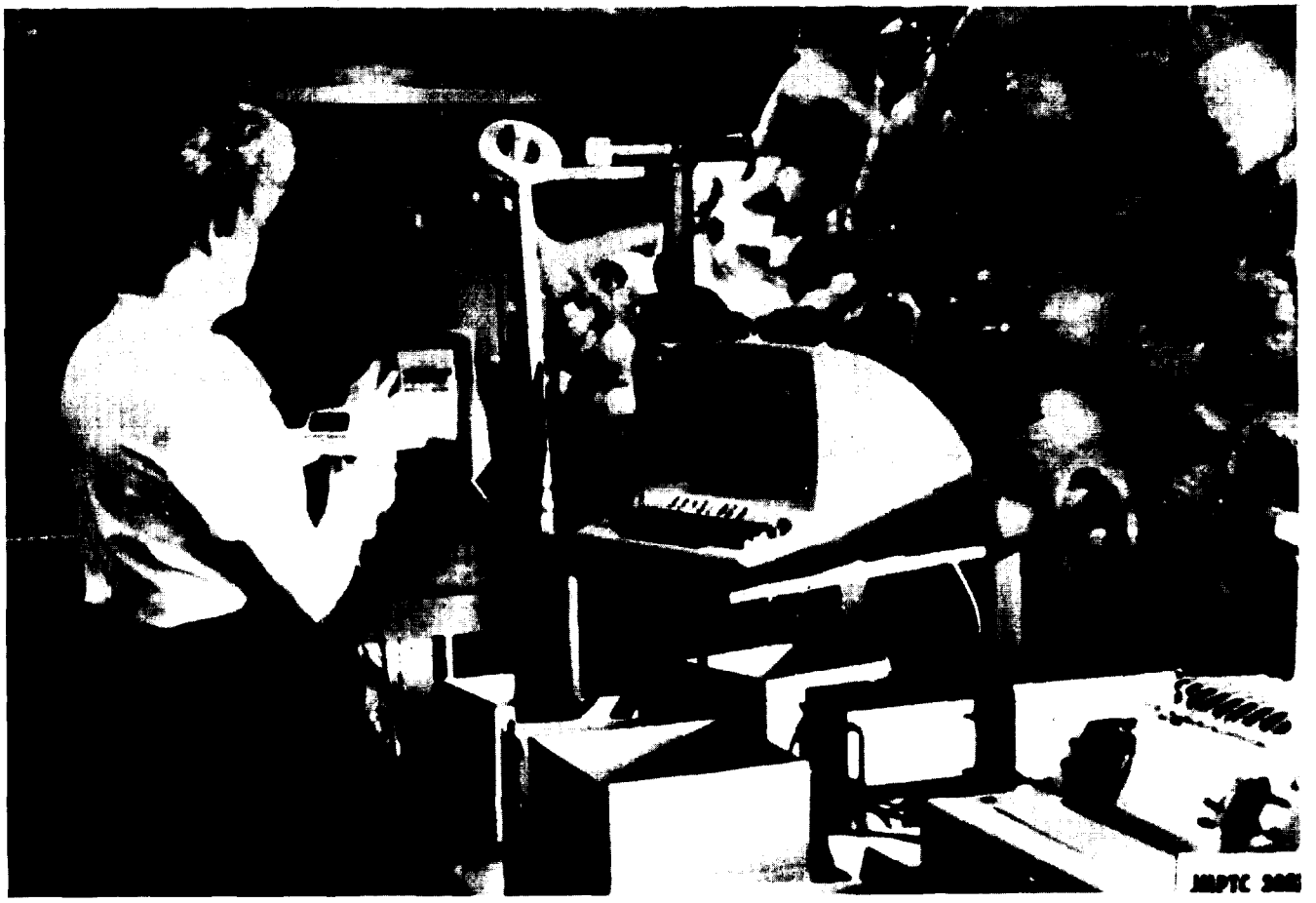


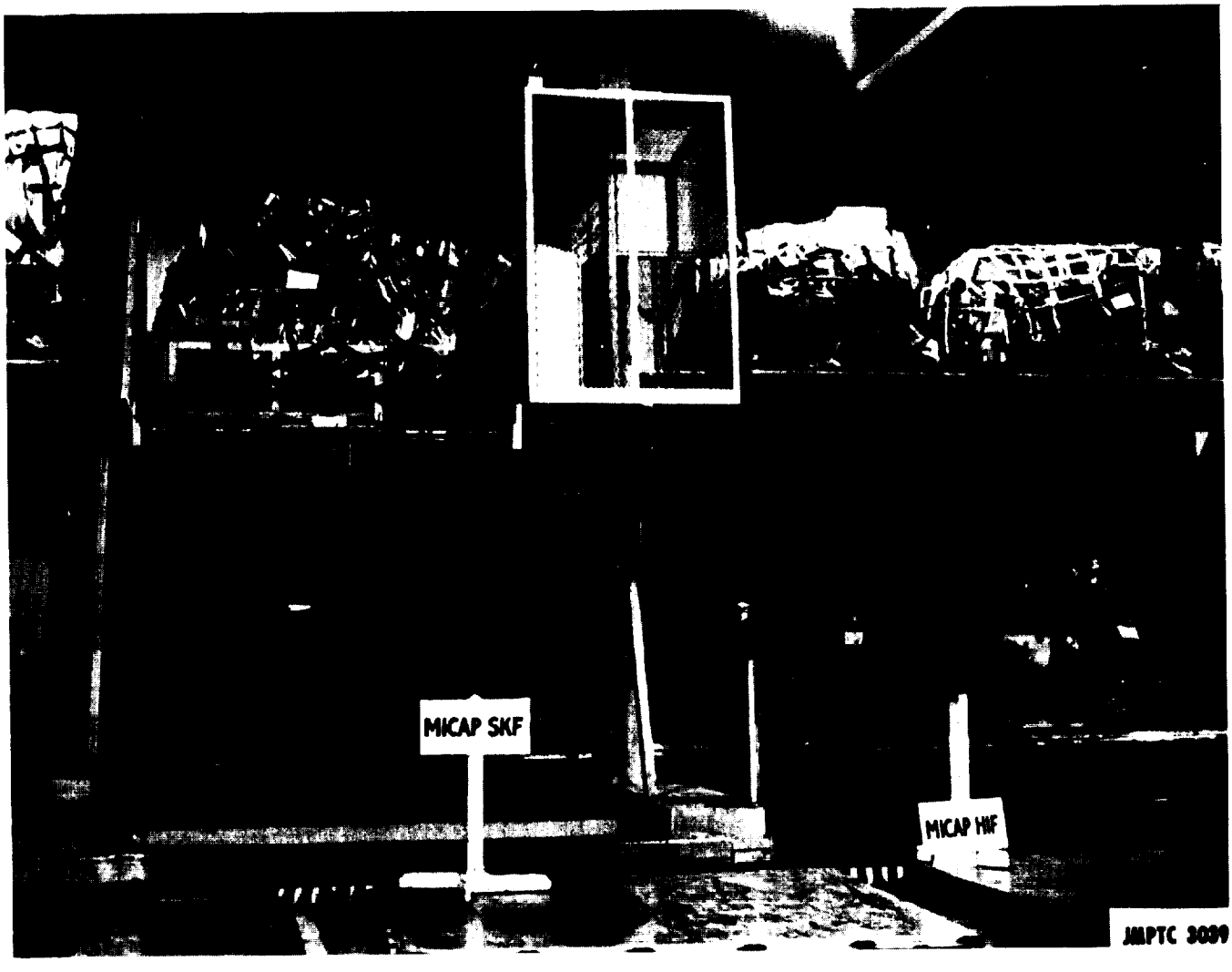
14-17. Relation of Automated Materials Handling to the Packaging Activity

a. Because an automated materials handling system normally requires a carefully programmed schedule, the flow of materials to and from the various depot activities must be carefully regulated and coordinated. This preplanning should enable the packaging supervisor to make a more accurate determination of personnel requirements and required cleaning, preserving and packing materials and operations.

b. When packaging equipment is mechanized, such equipment is arranged to mesh with the depot automated materials handling system. When this is done, less time is needed to move material from the packaging area to either the storage bins or the shipping area.

c. Most automated materials handling systems at the present time are designed for items to be placed in bins (fig 14-5). As future improvements occur there will be a decrease in the weight and cube limitations of items of supply to be handled and a decrease in the number of items that must be manually handled. Systems capable of handling loaded pallets in fast and efficient ways are now in use at depots, Air Force bases and other locations (fig 14-6).

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PART FOUR
MANAGEMENT CONSIDERATIONS IN PACKAGING
CHAPTER 15
PACKAGING STANDARDIZATION

Section I. DEPARTMENT OF DEFENSE STANDARDIZATION

15-1. Background

a. Throughout history, standardization has played an important part in man's achievements. Man has constantly engaged in standardization to some degree or other. To primitive man, standardization was the devising of methods to feed, clothe, and protect himself. Later, man adopted a standard of measure for surveying land. Gold coins were introduced as a standard of value, and standard forms of speech and writing were introduced to increase man's knowledge and understanding.

b. Man soon discovered that standardization also provided military leaders with the most effective means for improving their fighting forces. The first known military items standardized for the US Army were the muskets to which Andrew Jackson credits his victory at the battle of New Orleans. These muskets, produced in 1801 by Eli Whitney, were made to standards which called for high levels of workmanship, accuracy, interchangeability of parts, and utilization of standard ammunition. Today, standardization is one of the largest factors in the improved operational readiness of our overall fighting forces.

15-2. Department of Defense Standardization and Specification Program

a. Scope. The Department of Defense Standardization and Specification Program, as established by DOD Standardization Manual 4120.3-M is concerned with—

(1) Standardization of material, components, equipment, and processes with respect to items and services approved for use by the Army, Navy, Marine Corps, Air Force and the Defense Logistics Agency.

(2) Standardization of engineering practices and procedures essential to design, procurement, production, inspection application, preservation, and preparation for delivery of items of military supply.

b. Purpose.

(1) To improve the efficiency and effectiveness of logistical support and operational readiness of the Army, Navy, Air Force, Marine Corps and the Defense Logistics Agency.

(2) To conserve money, manpower, time, production facilities, and natural resources.

c. Objectives. Sections 2451-2456, Title 10, United States Code (The Defense Cataloging and Standardization Act), makes mandatory the achievement of the highest practicable degree of standardization throughout the Department of Defense. The objectives of this Act specify—

(1) Adoption of the minimum number of sizes, kinds, and types of items and services essential to military operations.

(2) Achievement of the optimum degree of interchangeability of the component parts used in these items.

(3) Development of standard terminology, codes, and drawing practices to achieve common understanding and clear interpretation of the description of items and practices.

(4) Preparation of engineering and purchase documents to ensure the design, purchase, and delivery of items consistent with the scope and purpose of the Defense Standardization Program.

(5) Providing the military departments with the most reliable equipment possible by the adoption of material which has been evaluated in accordance with established Government specifications and standards.

15-3. Administration of the Standardization Program

a. The Assistant Secretary of Defense for Acquisition and Logistics is responsible for Department of Defense Standardization and Specification Program (DSSP) policy guidance and administration. Acting as liaison between OASD and the services are the Defense Standardization Program Office (DSPO), the Defense Product Standards Office (DPSO), and the Defense Data Management Office (DDMO). Formerly these offices were collectively known as the Defense Materiel Specifications and Standards Office (DMSSO). Management of department participation in the DOD Standardization and Specification Program is accomplished by Departmental Standardization Offices (DEPSOs). These offices also act as contact points for gather-

ing reports and for policy implementation. The responsibilities of the DSPO, DPSO, and DDMO are:

(1) Defense Standardization Program Office (DSPO): all matters concerning DoDD 4120.3, DoD 4120.3-M, MIL-STD-961, MIL-STD-962, MIL-STD-143, DoDISS, ADCop (DoDD 5000.37); nongovernment standards policy (DoDI 4120.20); standardization training; liaison with NPFC and Standardization Management Activities; Accomplishment Report; Standardization Guidance; Standardization and Data Management Newsletter; and SD-1, SD-4, SD-8, and SD-9.

(2) Defense Product Standards Office (DPSO): all matters concerning product standardization (including systems, subsystems, components, equipment, parts, materials, processes, and technology/standardization interface management); metrication (DoDI 4120.18); the DoD Parts Control Program (DoDI 4120.19); qualification (i.e., qualified products list as described in SD-6, qualified manufacturers lists, and other standardization program plans for technology areas (except for those areas noted in (3) below) and for Federal Supply Classes (FSCs). Within DPSO, contact the Assistant Director for International Standardization for all matters concerning standardization policy, procedures and programs involving standardization documents (e.g., STANAGs, QSTAGs, AQAPs, AIRSTDs, IEC, and others sponsored by international standardization bodies and the defense treaty alliance organizations.)

(3) Defense Data Management Office (DDMO); Contact DDMO for all matters concerning overall data management policy, DoDD 5010.12, DoDI 4151.9, DOD-STD-963, Data Item Descriptions (DIDs), DoD 5010.12-L (AMSDL), CMAN, and program plans with adjunct responsibilities in DRPR, EDRS, EDS, and TMSS; with collateral interest (with DPSO) in CDNC.

b. Actual standardization of items, materials, procedures, and processes is accomplished by assignee and lead service activities.

(1) Assignee activities are those offices which manage Federal Supply Classification (FSC) classes. Lead service activities manage standardization areas which cover more than one FSC or relates to practices, procedures, and terminology.

(2) At the present time there are numerous FSC classes and standardization areas. These include 613 FSC numerical classes and 33 standardization areas. One of the latter is the PACK area. All standardization assignments made within the Department of Defense fall into one of the classes or areas. Determination of assignment within these classes or areas is based on activity interest and the end use of the item, procedure, study, or process. Most assignee activities manage numerous FSC classes or areas.

(3) The lead service activity's job, in brief, is to assign standardization projects to preparing activities and to approve or disapprove the project. Such projects include preparation of specifications and standards, revisions, amendments, technical analysis and engineering practice studies. The preparing activity will approve the document, date and number it, and arrange for reproduction and distribution. The lead service activity has responsibility to determine that the project scope was accomplished through review of a "printer's copy" of the document.

(4) One of the DOD standardization areas is the PACK area. This area is important since it includes documents which establish packaging requirements for much of today's military packaging. This area is unique in a sense, because it involves to a high degree all military departments, the Defense Logistics Agency, and the General Services Administration. In addition, the PACK area manager must understand the needs and problems concerning packaging throughout the logistics supply system.

15-4. Industry's Role in Defense Standardization

a. The Defense Standardization and Specification Program is paying increased recognition to non-Government standardization documents produced by nationally-known associations, organizations, and technical societies. This follows from a major mission of the DSSP, namely to develop, establish, and maintain a comprehensive and integrated system of technical documentation, one purpose of which is to save money, manpower, time, production facilities, and natural resources. Technical documentation comprises specifications, standards, handbooks, engineering drawings and related documents.

b. Thus it happens that a large number of industry associations have been identified by the DOD to assist in the Government's standardization program. Several of these widely known associations include the American Society for Testing and Materials, American Society of Mechanical Engineers, and the Institute of Electrical and Electronics Engineers.

c. Another major vehicle for Government-industry standardization are Commercial Item Descriptions (CID). These are brief, performance oriented product descriptions used in the acquisition and distribution of commercial and commercial-

type products. They are largely issued and controlled at the present time by the General Services Administration.

15-5. Requesting Standardization Projects

Any activity can request that a project be initiated by containing the lead service activity for a specific class or area. Adequate justification for a project should be included with the request. If in doubt about the contact point for a particular project, reference should be made to the Department of Defense Standardization Directory SD-1 (FSC class and Area Assignments). This publication lists the assignee activity for a particular FSC or area assignment and the mailing address of the appropriate point of contact.

Section II. STANDARDIZATION IN PACKAGING

15-6. Packaging and the Acquisition Dollar

a. The present Department of Defense stock catalog consists of over four million items; these items must be packaged and/or identified prior to storage or shipment. In order to accomplish necessary packaging for these items, there exists a multitude of procurement and packaging documents, some of which are in conflict with each other. It is possible to find manufacturers using different sets of instructions while packaging and marking the same item for delivery to the respective military services. This is one of the prime reasons why packaging standardization is necessary.

b. Packaging costs take up a considerable amount of the procurement dollar. In some instances, the cost of packaging the item is more than the cost of the item itself. Reduction in this area would permit purchase of more items per dollar expended.

15-7. Objectives of Packaging Standardization

a. Like Packaging for Like Items. The majority of items in the military supply system have characteristics which are similar to hundreds or even thousands of other items. Work is going on toward the development of documentation of criteria which will assure uniform packages for items which met a preestablished set of characteristics.

b. Reduction of Materials and Methods.

(1) This objective goes hand in hand with the first objective. At the present time there are many preservation and packaging materials classified in various types, grades, glasses, styles, etc. Because of this great variety of materials, the problem of material availability is common at vendor's plants and military packaging activities. Nonavailability of prescribed materials results in requests for waivers of substitutions which, when granted, often result in underpackaging or overpackaging at more cost to the Government.

(2) Whenever possible, methods should be reduced to the maximum extent practicable by making effective use of methods capable of mechanical application while still attaining adequate economical, and uniform protection.

(3) The reduction of materials and methods through standardization would bring about—

(*a*) Reduced inventories.
(*b*) Reduced procurement costs.
(*c*) Improved workmanship.
(*d*) Increased production.
(*e*) Simplified documentation.

c. Reduction of number of packaging documents. This objective can be realized by the elimination of needless or duplicating documents. At the present time there are many instances where two documents exist for the procurement of the same item. The difference between a Federal and military specification is frequently only a slight difference in the requirements; a change to either document results in the cancellation of the other. This is an area where users of documents in packaging operations are often best qualified to make known such duplications.

15-8. Pack Standardization Area

a. The assignee activity for the PACK area is the U.S. Army Materiel Command Packaging, Storage, and Containerization Center (AMCPSCC) located at Tobyhanna Army Depot, PA.

b. The "PACK" DOD standardization area is established for the purpose of centralizing within DOD components, the lead-service responsibility for management of standardization program activities. Developing and maintaining the currency of military specifications and standards relating to packaging requirements, procedures and practices are important parts of the program.

c. The assigned lead-service (AMCPSCC) has the central program management responsibility for identifying, providing application guidance, promoting, planning, scheduling, coordinating, controlling and maintaining standardization documents falling within the purview of the DOD Standardization Program, which relate to the following:

(1) Packaging—Preservation Methods.
(2) Packaging Requirement Codes.
(3) Procedures for Packaging.
(4) Materials used in Packaging.
(5) Packaging—Data Requirements.
(6) Identification Marking for Storage, Handling and Shipment.
(7) Item Preparation for Delivery.
(8) Transportability Requirements.
(9) Packaging Design for Systems and Equipment.
(10) Packaging Cargo Interface Considerations.
(11) Reusable Packaging Methods.
(12) Terms and Definitions for Packaging, Handling, and Transportability.

15-9. Initiation of Pack Standardization Projects

a. Standardization projects stem from requests by DOD components, and the General Services Administration. Projects may also be generated by the AMCPSCC, based on determinations that a change will meet a PACK objective; these determinations are arrived at through PACK document research, review of standardization listings, changes in field requirements, and industry recommendations. Project requests may also be generated by a preparing activity which has the task of maintaining a particular document.

b. In general, activities engaged in preservation and packing are in a better position to recognize a need for new or revised documents than are those at a headquarters or staff level. Accordingly, the bulk of such requests for revisions to specifications or standards should come from the user. For example, any activity that recognizes a packaging need or a need for a change to MIL-P-116 would contact its respective departmental custodian. The request would be evaluated and, if valid, contact would be made with the preparing activity; if acceptable to the latter, a project for an amendment or revision would be initiated by the PACK area assignee. Based on priority and amount of work involved, project completion would probably range from one to six quarters.

15-10. Managers and Packaging Standardization

a. Operating level. The people who prescribe packaging are different from those who actually accomplish the packaging. Personnel involved at the operating level can render a real service by making known those conditions which are in need of improvement and change.

b. Packaging management level. Those who supervise the preparation of packaging prescriptions should be aware of conditions and problems which can be caused by improper prescriptions. Wherever possible, methods and procedures that lend themselves to mechanical applications should be cited. Only those materials which are readily available should generally be prescribed.

c. Other management levels. Managers in the areas of procurement, supply, and transportation also are in a position to assist in packaging standardization efforts and to advise on potential projects.

(1) *Procurement managers.* A part to be played by managers in this area is to determine if their employees have received adequate training which will enable them to single out defects in procurement documents. An example would be in comparing contracts for like items at different times and reporting obvious examples of underpackaging or overpackaging.

(2) *Supply managers.* These individuals should also influence their people to report packaging discrepancies. An employee in the field of supply, if adequately trained to recognize improper packaging trends, would be a great asset to the standardization program.

(3) *Transportation managers.* Since one of the ever-present problems centers on weight and cube of shipments, transportation people are in a position to assist packaging and storage personnel by keeping them advised when there appears to be unusual cube and weight increases. By creating an awareness of the value of standard container size wherever possible, other actions will occur which will be of mutual benefit for all concerned.

15-11. Standardization of Packaging Documentation in Contracts

There are nearly as many different forms, formats, instructions, and clauses for prescribing packaging in contracts as there are procuring activities. There is a project now underway to effect standardization of these forms, formats, clauses and other documents. This will benefit all DOD activities.

CHAPTER 16
APPLICATION OF AUTOMATIC DATA PROCESSING SYSTEMS (ADPS) TO PACKAGING

Section I. ADVANTAGES OF AUTOMATIC DATA PROCESSING

16-1. General

a. In an organization as large as the Department of Defense, one of the basic problems is communication. This is as important a problem in the field of packaging as it is in any other logistic operation. The ability of electronic computers to store information, to process it as programmed, and to publish the results of its operations at incredibly high speeds has done much to minimize this problem of communications in expressing, maintaining, and revising military packaging requirements.

b. Through the use of electronic computers, the military has been able to achieve a much greater speed of response to changes in packaging requirements than was possible before the adoption of automatic data processing systems (ADPS) by the services.

Section II. THE APPLICATION OF ADPS TO PACKAGING

16-2. General

a. The electronic computer, with its ability to store data, make speedy correlations, and furnish information on order, is an ideal tool to maintain and control the tremendous inventory necessary to support the services.

b. Electronic computers were first used by the logistic elements of the services for just this purpose—inventory control and stock management.

c. At the time when electronic computers were being introduced into the supply system, it was becoming apparent that the paperwork involved with military packaging was becoming a burdensome factor which hindered effectiveness and accuracy.

d. Because of the computer's ability to store great quantities of data, the use of ADPS seemed a logical way to reduce and minimize the mountains of paperwork generated by applying narrative requirements to repetitive acquisition documents.

e. Several methods of applying the automatic data processing tool to the storing of packaging requirements and the furnishing of these requirements on request were developed by various activities within the services, each tailored to express needs of the activity and influenced by the particular electronic computer in use and by how the activity was using its computer.

f. Some consisted of abbreviations; some made reference to standard instructions; still others were coding systems which established references for citing the different elements of packaging requirements.

16-3. Coding Systems

a. Coding systems came rapidly to the forefront, with one or more coding systems being advocated by, and used, in each of the services.

b. Each of the systems had merit and served the purpose of the agency implementing it, but a multitude of similar, but not identical, systems does not facilitate implementation or acceptance by industry. They even retard the ability of services to exchange data among themselves.

c. Spurred by complaints from industry, a joint task group devised a code to be used to express packaging requirements. This code included the best elements of several previous systems, and met all the requirements of automatically storing, manipulating, applying, and comparing packaging requirements. This code was published as MIL-STD-726 and was mandatory for use by all agencies using coded packaging data in procurement.

16-4. Current Systems

a. DOD PACKAGING DATA SYSTEM

(1) While the publication of MIL-STD-726 served to standardized coded packaging data, the wide variety of forms and formats used within the DOD to communicate non-coded packaging data continued to retard the exchange of data and increase packaging costs within DOD and to DOD from industry. Based on OASD direction to standardize packaging requirements and documentation, the DOD Packaging Data System was developed and published in July 1984 as MIL-STD-2073.

(2) The DOD Packaging Data System is based on two documents–MIL–STD–2073–1, the basic document for the system and MIL–STD–2073–2, the codes used for recording packaging requirements. This system provides a uniform approach to packaging DOD materiel and allows for full use of computer technology in development, storage, dissemination, and exchange of packaging data.

(3) The DOD Packaging Data System requires that all materiel to be packaged be categorized by chemical composition, weight, size, fragility, and preservative requirements and based on the categorization, classified into one of three types of items; namely, common, selective, or special.

(a) Common items qualify for prescription of predetermined packaging codes contained in MIL–STD–2073–1. The use of predetermined packaging eliminates duplication of effort and provides like packaging for like items.

(b) Selective items are those items which cannot appropriately use predetermined packaging but for which packaging requirements can adequately be described in code with up to 59 positions of in-the-clear text, as required.

(c) Items are classified as special when their weight, configuration, complexity, fragility, or other considerations dictate the use of detailed, often engineered, narrative type instructions frequently supplemented by drawings. The packaging instructions for special items are contained on Special Packaging Instructions (SPIs), DD Form 2169.

b. Container Design Retrieval System (CDRS).

(1) Container design proliferation has been a matter of concern for a number of years. Engineering costs for these designs range from a few hundred dollars to over a hundred thousand dollars each.

(2) If we consider all designs that are presently in the total military system, we recognize a very considerable investment with limited follow-on value. Normally containers are without specific identity apart from the commodity being protected; consequently, reuse of a particular design for new requirements is limited to those projects where the engineer has knowledge of the previous effort.

(3) The CDRS provides a centralized, automated data system for storing, retrieving, and analyzing designs and related test information on specialized shipping and storage containers that already exist. Data is matched against requirements for new container designs. Frequently this process results in the reuse of existing inventory at substantial cost savings.

(4) The Air Force manages the container design retrieval system. Regulating document is AFR 71–12/AR 700–16/NAVMATINST 4030.10/DLAR 4145.35. Coordination is provided by the Container Retrieval System Management Office (CDRS/MO), Eglin Air Force Base, FL. This activity provides CDRS service to all DOD development and procurement activities.

(5) Objectives of the system are to provide—

(a) A uniform means of identifying, recording, and retaining technical and item management information on specialized containers.

(b) In-depth review of technical container data on existing container assets to determine their reusability in new defense systems acquisitions.

(c) Prevent reusable specialized containers from being disposed of as excess property before determining their possible use in new defense systems programs.

(d) Standardize containers among similar items and among the various DOD components.

c. Hazardous Materials Information System (HMIS). This system is a repository for collecting, maintaining and broadcasting hazardous materials data required at all levels of DOD management so as to develop procedures to inform Federal government personnel of various kinds of hazardous materials. Included are such materials as flammable liquids and flammable solids, corrosives, oxidizers and radioactive materials usually encountered in the work place. The procedures developed help avoid accidents in the handling storage, use, transportation and disposal of these items.

(1) Presently, the system contains transportation, health and safety data. Hazardous waste disposal information is planned for early inclusion.

(a) Transportation data consists of the shipping name of the hazardous material, the hazard classification, and label requirements. Once out of the computer, this information leads to hazardous materials tables published in various transportation regulations such as Title 49 of the Code of Federal Regulations which in turn yield information about proper methods of packaging.

(b) Safety and health data include health hazard data, spill and leak procedures data, and special protection and precaution data.

(2) The output of the HMIS is principally microfiche, but magnetic tapes and hard copy interrogation replies are also available. Data is arranged in stock number sequence.

(3) Detailed explanation of data elements in the system are contained in DOD Manual 6050.5–M, DOD Hazardous Materials Information System Procedures.

(4) Authority for the HMIS rests with DOD Instruction 6050.5. The system is administered by the Defense Logistics Agency.

CHAPTER 17
GENERAL SERVICES ADMINISTRATION SUPPORT TO MILITARY PACKAGING

Section I. ORGANIZATION AND FUNCTIONS

17-1. History, Mission, and Structure of General Services Administration

a. A brief explanation of the history, basis in law, missions, and general structure of the General Services Administration (GSA) will provide a background for understanding how the Federal Supply Service fits into the picture.

b. In 1948, the President sent a message to Congress which urged that a better system of property management be established for the Federal Government to coordinate activities concerned with the acquisition, use, and disposal of Government property. Shortly thereafter, the report of the first Hoover Commission, entitled "Office of General Services," contained a strong recommendation for the establishment of centralized direction of the supply, records management, and public buildings operation and maintenance functions of the Federal Government. As a result, Public Law 152, the Federal Property and Administrative Services Act, was enacted in 1949, which established the General Services Administration (GSA) and transferred to it from discontinued predecessor agencies the responsibility for the direction and coordination of the internal Government business management functions enumerated above. Several later presidential reorganizational plans and supplemental provisions to the basic law assigned collateral functions connected with these activities.

c. The Administrator of General Services, subject to the direction and control of the President, accordingly directs the execution of all functions assigned to the Administration by the aforementioned Federal Property and Administrative Services Act of 1949, as amended by other laws and Presidential reorganization plans.

d. The principal missions of GSA and the primary purpose of its establishment are reflected in the declaration of policy contained in the Act, and pertain primarily to coordination of the Government's supply and public buildings operation. After a period of expansion that paralleled the growth of Government for over the past 3 decades, GSA is now focusing on performing functions that will clearly benefit from economics of scale or from centralized management and is decentralizing the responsibility for performing other functions to Federal agencies.

e. GSA is grouped organizationally to promote the most effective accomplishment of its primary responsibilities, and its current organizational structure has evolved as experience dictated and as additional functions were acquired (figure 17-1). It consists of four services and ten staff offices. The services are the Federal Supply Service, Public Buildings Service, Federal Property Resources Service, and Information Resources Management Service. The staff offices are the Office of Administration, Office of Acquisition Policy, Office of General Counsel, Board of Contract Appeals, Office of the Comptroller, Office of Congressional Affairs, Office of Policy Analysis, Office of Public Affairs, Information Security Oversight Office, and the Office of Operations. Their responsibilities are generally as their titles imply.

17-2. Role and Mission of the Federal Supply Service

a. In the execution of its logistics management responsibilities, the Federal Supply Service (FSS) provides over $6 billion worth of essential goods and services to Federal agencies each year. FSS consists of more than 5,100 employees serving the Government's needs worldwide. FSS is a true "cradle to grave" logistics operation, serving as the integrated material manager for nearly 20,000 specific commodities commonly used by both civilian and military agencies, ranging from such mundane items as office products and supplies, to the high technology of scientific and electronic equipment.

b. Nearly 7 million requisitions are processed and $1 billion worth of supplies are shipped through the wholesale distribution system each year. Agency needs are satisfied for nearly double that amount—approximately $2 billion worth of goods—through the Federal Supply Schedules program, under which agencies order directly from vendors at discount prices renegotiated by FSS. An additional $70 million worth of small, retail quantities of several thousand high-demand office products and supplies are purchased though the retail distribution system.

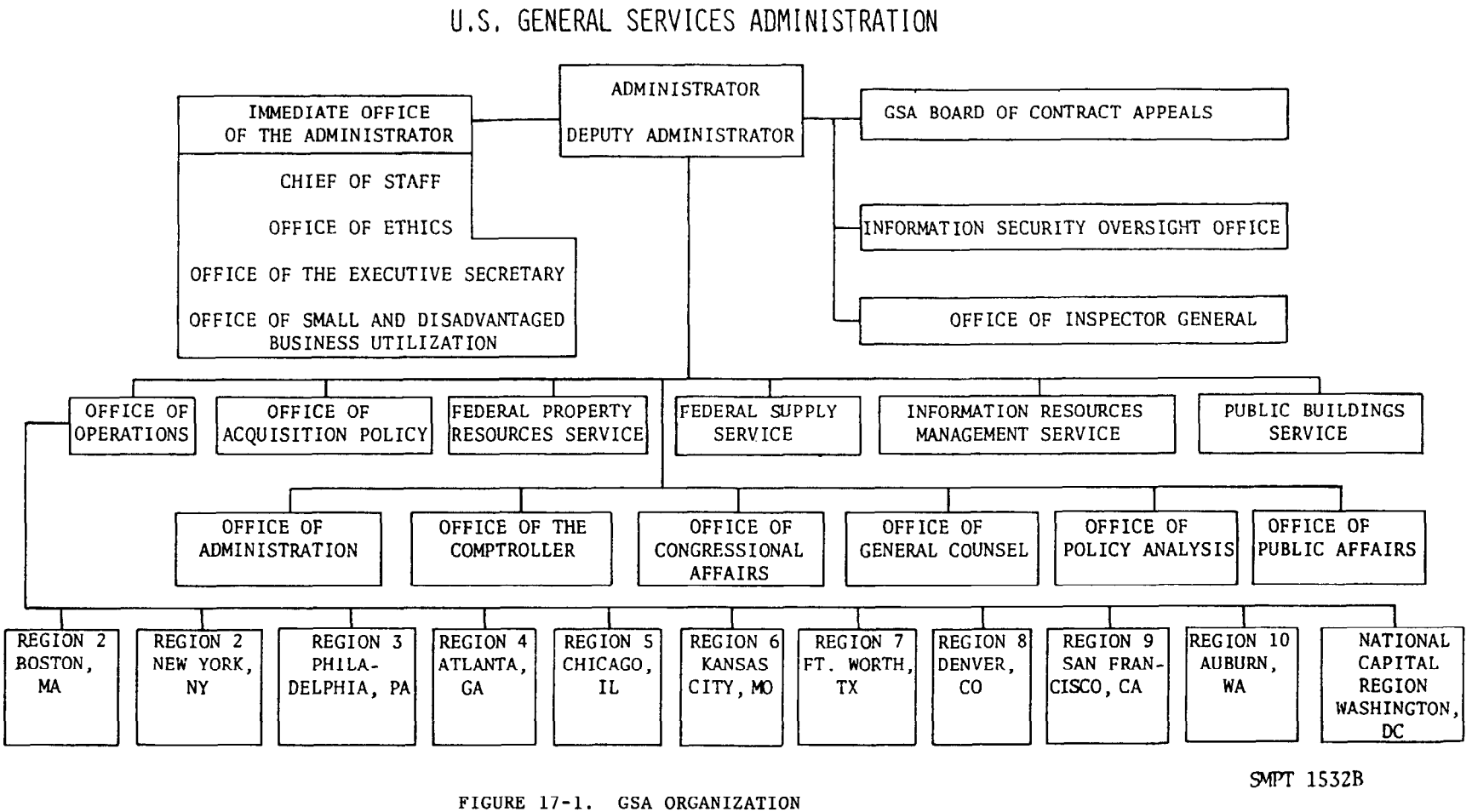

FIGURE 17-1. GSA ORGANIZATION

c. In addition to meeting agency needs for commercial products, FSS provides vehicle fleet management, travel and transportation management, and property management services to all Federal customers.

d. To assist customer agencies in minimizing their costs for motor vehicle support, FSS manages the 85,000 vehicle-strong Interagency Fleet Management System. Through 56 Fleet Management Centers located throughout the 50 States and Puerto Rico, FSS provides for the complete short and long term motor vehicles needs of its customers. FSS also maintains a Government wide Fleet Information Program, to include over 450,000 motor vehicles, and civil agency aircraft.

e. FSS provides for a full range of travel services for Federal employees, including direct vendor discounts with scheduled airlines, hotels and car rental agencies, cost-free travel reservations through commercial travel agencies and Scheduled Airlines Traffic Offices (SATO's), and streamlined travel payment and expense procedures.

f. To obtain reduced air fares for Federal employees on official business, FSS negotiates discount rates with airlines, called City-Pairs, to frequently traveled points. Similar discounts have been obtained from nearly 4,500 hotels and motels worldwide and, under a cooperative agreement with the Department of Defense, from all major car rental agencies, to help Federal agencies and their employees stretch their travel dollars to the fullest limits possible. These programs benefit all Federal employees, whether civilian or military.

g. To ensure that Federal civilian agencies and their employees make full use of available discounts, FSS contracts with commercial travel agencies and SATO's to make official travel arrangements on a geographic basis. This service is provided cost-free to agencies in all major cities throughout the continental United States, as well as Alaska, Hawaii and Puerto Rico.

h. To streamline the means of paying for official travel, FSS contracted with Citicorp to issue Diners Club charge cards and Citicorp travelers checks in lieu of cash advances to cover employee travel expenses.

i. As the traffic manager for Federal civilian agencies, FSS maintains separate programs for the economical shipment of general freight, and for the household goods and personal effects of employees who are required to relocate.

j. In addition to its direct support activities, FSS is responsible for the development of the Federal Travel Regulations, and performs cost studies of per diem, relocation allowances, and the use of privately owned vehicles for official business. FSS is also responsible for developing and issuing Government wide Federal Property Management Regulations pertaining to personal property management, supply, and transportation. Through these programs, FSS provides essential policy and procedural guidance, and important management information that has far reaching effects on the day-to-day administrative operations of the customer agencies.

k. FSS acts as the Government's personal property manager. Under the guiding principle that usable, excess property constitutes the first source of supply, FSS acts as a broker in arranging for the transfer of common-use items from agencies that no longer need them to those that do. Property that is usable, but surplus to the needs of the Federal Government, is made available to eligible public institutions, including State governments. Items that are neither transferred between Federal agencies nor donated are offered for public sale through competitive bidding.

l. To meet customers' needs for common-use products, FSS administers three basic programs through which nearly $4 billion of essential supplies are provided each year. They include the stock, special order, and Federal Supply Schedule programs.

m. The stock program is predicated upon the belief that there are certain items for which both demand and essential product characteristics are relatively constant, and which can be most economically procured in bulk and subsequently redistributed as needed to customer agencies. Examples of stock items include paper products, office supplies and accessories, hand tools and cleaning and maintenance products. Stock items are issued through either the wholesale or retail distribution outlets, depending upon the needs of the agency and the quantity of items to be shipped. A third distribution method is direct delivery of wholesale quantities of stock items from the vendor to the customer.

n. The special order program is used to procure items for which GSA is the established source of supply, but for which demand is limited or related to special needs. Because of limited demand, such items are not carried in stock nor do they usually justify the expense related to inclusion in a Federal Supply Schedule. Special order program items range from specially marked envelopes to fire engines, and are purchased for direct shipment from the vendor to the user.

o. The Federal Supply Schedule program is GSA's largest support program in terms of dollars; it accounts for nearly $2 billion worth of supply purchases each year and can be likened to a mail order catalog. In essence FSS negotiates discount prices with vendors through competitive procedures, and in turn, publishes schedules listing the products, vendors and prices from which agencies may place orders for direct shipments. Contracts are awarded to schedule vendors on both a multiple and single award basis, depending upon the nature of the product being procured. Multiple awards generally are employed for items subject to evolving technology, and items for which agency demands are both variable and subject to unique mission requirements.

17-3. Organization and Functions

a. The Federal Supply Service is organized on the principle of grouping related functions under single responsibility for supervision, and its elements are so alined as to facilitate close coordination and teamwork. Figure 17-2 shows how the Federal Supply Service is organized at the Central Office level.

b. The FSS Central Office, headed by a Commissioner, consists of an Office of Program Support, Office of Policy and Agency Liaison, and the Office of Transportation Audits; four nationwide program oversight offices; and four operating commodity centers. Program offices include the Office of Customer Support Management, Commodity Management, Quality and Contract Administration. The commodity centers include centralized buying activities for furniture; tools; automobiles; and office and scientific products.

c. The Office of Program Support is the management arm of the organization and controls the dollars, sets the budget, and monitors the use of resources, both monetary and human. It develops policy and provides nationwide support in areas of budget administration, productivity measurement resources management, training, management review, management information systems, forecasting, and data systems management. It is the liaison between FSS and the finance and budget offices of GSA and the Office of Management and Budget. It is also the point of coordination and monitoring of major management initiatives, audit resolution, and organization and training.

d. The Office of Policy and Agency Liaison is the chief planning and policy-making organization in the Federal Supply Service. The office is customer-oriented and seeks to ensure the most responsive worldwide support to its customers at the least total cost to the Government. It provides oversight of regional Customer Service Bureaus which are single points of responsibility for enhanced retail supply, transportation and travel, and property management services. It has Customer Service Officers worldwide to assist in fulfilling the FSS mission. The office coordinates the establishment of external policy for the improved management of personal property and nonpersonal services throughout the Government through the Federal Property Management Regulations. It establishes internal policies to ensure adequate support for the FSS Governmentwide mission.

e. The Office of Transportation Audits primary function is auditing transportation bills paid by the Government for issuing claims against transportation carriers and for collecting overcharges. It is also responsible for the Federal Property Management Regulations that govern transportation documentation and audits. This office maintains liaison with other Federal agencies and the transportation industry, in general.

f. The Office of Customer Support Management plans, directs, and manages, on a worldwide basis, programs and activities relating to the cost-effective distribution of materials procured by FSS for customer agencies; the best use of excess personal property (except ADP equipment) including the transfer, donation, and/or sale of surplus personal property; and the efficient provision of responsive Governmentwide transportation, traffic, travel, and vehicle fleet support and services.

g. The Office of Commodity Management is tasked with providing nationwide leadership in developing, managing, and executing FSS commodity management programs including acquisition, cataloging, technical support, and inventory and requisition management. It determines the most cost-effective method of acquisition for FSS supplies and services. The office also directs efforts related to commodity management, market research, and economic assessment, and develops engineering and technical support documents for assigned items of FSS contracting and purchasing programs. Additionally, it manages the Federal Catalog System and publishes Federal Supply Schedule documents for world-wide distribution, operates a schedules information center to handle customer questions, and publishes the GSA catalog. It also oversees the development and operation of an automated system which automatically produces purchase order documents and maintains acquisition history. The office oversees the operations of all commodity centers and manages and

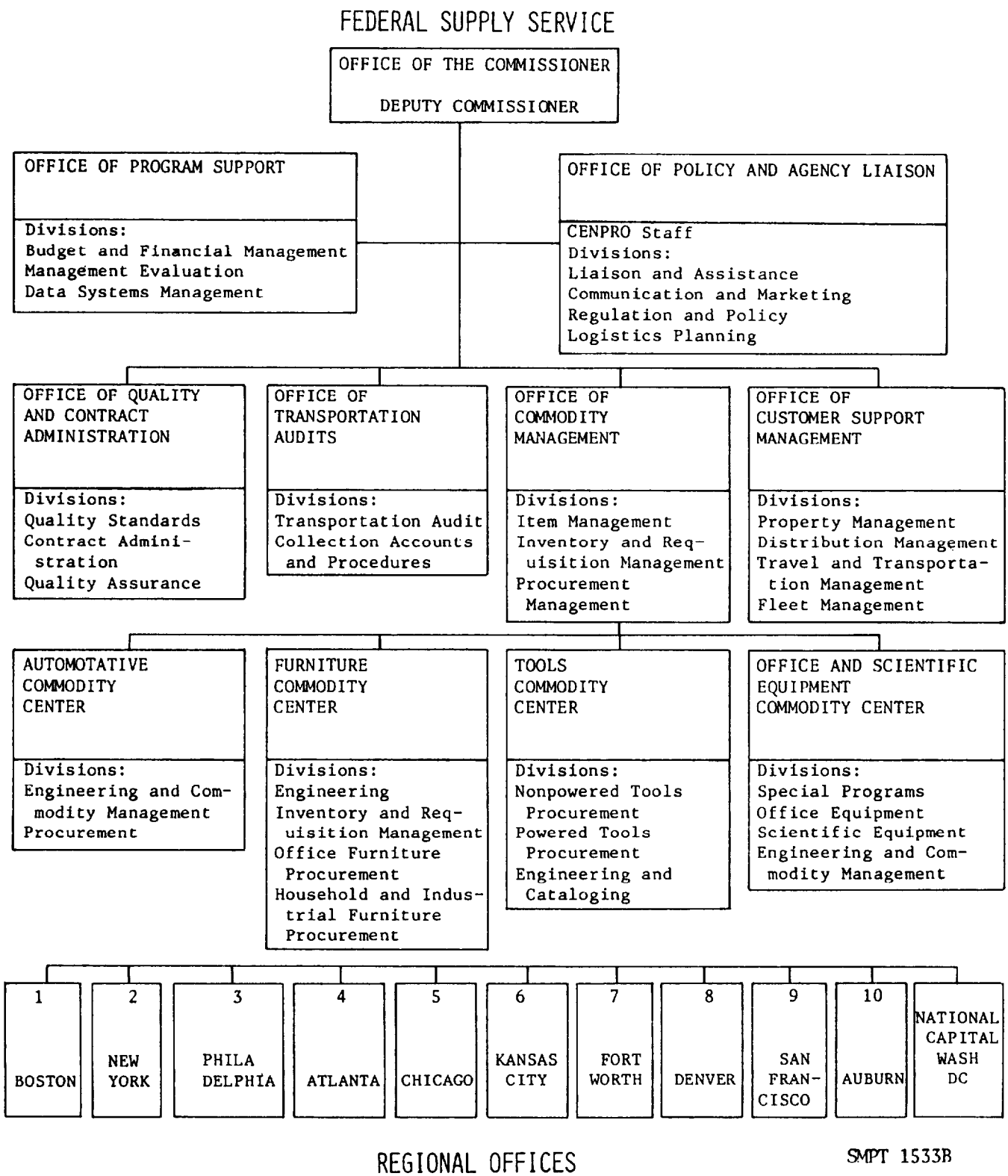

FIGURE 17-2. FSS ORGANIZATION

directs the commodity centers located in Washington, DC.

h. The Automotive Commodity Center is responsible for supplying the Federal Government with vehicles and automotive supplies. Its staff performs all commodity management, contracting, engineering, specification design, market research and analysis, and industry relations functions relating to vehicles. The office participates with other agencies in evaluating new or improved motor fuels, power systems, safety features, fuel economy devices, pollution control systems, and the like.

i. The Furniture Commodity Center supports the Government's worldwide requirements for furniture and furnishings. Its staff performs functions including commodity management, engineering, contracting, inventory management, and supply management. The Center also sets furniture use standards to ensure appropriate and cost effective expenditure of tax dollars.

j. Office and Scientific Equipment Commodity Center is primarily responsible for developing Federal Supply Schedule contracts for supplying common-use items and office and scientific equipment of Federal agencies. The Center also purchases special items to meet the unique needs of overseas activities of the State Department, the Agency for International Development, and the Department of the Treasury. Its staff performs all necessary commodity management and engineering in support of the contracting effort.

k. The Tools Commodity Center is the national program manager responsible for supplying the Federal Government with hand tools and related items. Its functions include commodity management, contracting, inventory management, cataloging, engineering, and supply management as they relate to the tools area, as well as a limited amount of contract administration. The Department of Defense is the biggest tools customer; many of these tools are used on military aircraft, tactical vehicles, and weapons systems.

l. The Office of Quality and Contract Administration oversees the national procurement program assuring timely delivery of high quality products. The office functions include performing manufacturing facility inspections, investigating quality problems, performing responsibility checks of offerors, maintaining on-time delivery performance, effecting all contract changes and modifications, suggesting specification changes to optimize quality in products, and continually supporting the Offices of Commodity Management and Customer Support Management and the customer agency to assure that quality products are available when needed.

Section II. SUPPORT TO THE MILITARY

17-4. Basis for Support

a. In 1960, the Department of Defense issued three instructions relative to military activities obtaining materiel from GSA stock or Federal Supply Schedules. The instructions are numbered DODI 4140.5, DODI 4140.7, and DODI 4140.14. The purpose of the instructions is to eliminate duplication in acquisition, to take advantage of large purchase discounts, even though the requisition is for a small quantity, and to centralize stock management of items of supply common to Government agencies.

b. When this program was first implemented, GSA entered into individual agreements with the single managers, who at the time, had cognizance over particular classes of supply, to jointly review and analyze the Federal Stock Classifications (FSC's) with the intent that GSA would undertake the procurement and stocking of those FSC's which were deemed to be economically advantageous for GSA to manage. After the Defense Logistics Agency (DLA) was established, GSA and DLA entered into a blanket agreement which was expanded so that GSA can assume supply responsibility for an individual item, a family group, or a complete class.

c. Under terms of this agreement, neither a change in the item nor the dropping of the item from either the Federal or military catalog can be ordered without joint action of DLA and GSA.

d. It is mandatory for military activities to procure GSA-managed items through GSA unless the required delivery date cannot be met by GSA or by its contractor on the Federal Supply Schedule. In this case the activity can buy directly from any source that can meet its requirements.

e. GSA has recommended and DLA has accepted management of some classes for all Government needs, where the economics of supply indicate that DLA management is more appropriate.

17-5. GSA Support in Packaging

a. The impact of GSA supply support to DOD in the supply of common items gave tremendous impetus to the Federal specifications program. This program provides the means to ensure adequate quality levels of supply items needed by Federal agencies. It stimulates broad competition

and is an important factor in improving the economy of supply operations.

b. The packaging specialists in each of the commodity centers prepare section 5 (preparation of delivery) of all Federal specifications which are developed in the Federal Supply Service and review this section in all Federal specifications prepared elsewhere.

c. In the preparation of section 5, GSA includes all the military requirements where appropriate.

d. GSA also operates storage facilities nationwide. Packaging personnel have been trained in military packaging requirements and conform to those requirements when filling military requisitions.

17-6. Benefits Accruing to the Military

a. The policy of turning over to GSA the procurement and stock management of common civilian-type items used by the military has relieved the DLA and other military procurement offices of an appreciable segment of procurement and supply support and has left them free to concentrate on purely military items.

b. By consolidating most Government needs into one pool, the mass purchasing power of GSA results in lower item costs and lower costs of procurement and contract administration. Military activities can obtain small quantities of items through GSA at the lowest cost from GSA stock, by ordering directly from a supplier in the Federal Supply Schedule, or thru the special order program.

c. Many duplicate departmental specifications have been eliminated, and differing specifications for similar items have been collated into a single specification through negotiating agreements on slight changes in requirements.

d. This constant review of Federal specification packaging requirements has revealed many opportunities for package standardization with the resultant benefits of reduced tare weight and cube and lowered costs.

e. Industry, technical societies, trade associations, and Federal agencies, including the military, participate in the development and coordination of Federal specifications. The program, thus provided, is responsive to the user's supply needs and generates many service and dollar benefits.

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